FOREIGN INVESTOR TRADING AND SPILLOVERS TO LOCAL-CURRENCY BOND MARKETS IN SEACEN ECONOMIES: A CASE STUDY APPROACH

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The SEACEN Centre

The South East Asian Central Banks (SEACEN) Research and Training Centre
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Project Leader

FOREWORD

Since the financial crises of the late 1990s, SEACEN member economies have made noticeable strides in their local currency (LC) bond markets. This evolution has helped reduce dependence on foreign currency debt and address the long-standing challenge of "original sin"—the inability of emerging market economies (EMEs) to borrow externally in their own currency, exposing them to significant currency mismatch risks.

While the growth of LC bond markets has mitigated some vulnerabilities, it has also introduced a new form of financial instability—"original sin redux." In this scenario, foreign investors hold LC bonds without hedging currency risk, shifting the mismatch from domestic borrowers to external lenders rather than eliminating the risk.

This study aims to deepen understanding of how external shocks—such as shifts in global risk sentiment or interest rates—affect LC government bond markets in SEACEN economies. It seeks to inform policy strategies that preserve the benefits of foreign investor participation while mitigating potentially destabilising effects. Given the complexity of transmission mechanisms—shaped by country-specific factors like market structure, regulatory frameworks, and macroeconomic fundamentals—this volume complements cross-country analysis with detailed case studies.

The relevance of this work is underscored by recurring episodes of global financial stress, including the 2008–09 Global Financial Crisis, the 2013 Taper Tantrum, the COVID-19 shock of 2020, and the US rate hikes of 2022. Its insights are vital not only for more advanced SEACEN economies with established bond markets, but also for those in earlier stages of development, preparing for deeper integration with global capital markets.

The project team included representatives from the following central banks: Bank Negara Malaysia, Bank of Thailand, Bank of Korea, Central Bank, Chinese Taipei, State Bank of Vietnam, and National Bank of Cambodia. The team was further joined by a researcher from the Ministry of Finance, Indonesia, as a co-author with the Project Leader in Chapter 7 of this study. The SEACEN Centre would like to express its sincere gratitude to all the team members and participating institutions for their contributions and support for this project.

The project was developed by Dr. Atsuyoshi Morozumi, Assistant Professor, University of Nottingham, UK, under the research theme of "Monetary Policy Challenges in Times of Tighter Financial Conditions". Dr. Morozumi, appointed Visiting Research Economist at The SEACEN Centre in 2024, also led the project. We extend our sincere gratitude to Dr. Ole Rummel, Director of Macroeconomic and Monetary Policy Management, SEACEN, for his overall guidance and leadership throughout the project. We also gratefully acknowledge the valuable feedback from SEACEN staff members, particularly Dr. Meltem Chadwick, Dr. Nur Ain Shahrier and Mr. Ahmad Aizudeen. The SEACEN centre is pleased to have contributed to the project through an online research workshop and an in-person Seminar held at its premises, where the project findings were presented and discussed. It is sincerely hoped that this study will deepen our understanding of the role of foreign investors in the spillover effects of global shocks on SEACEN economies' government bond markets, and help develop a more nuanced approach to mitigate possible adverse effects in times of future global shocks.

Dr. Cynyoung Park
Executive Director
August 2025

ABSTRACT

Over the last two decades, emerging market economy (EME) governments have borrowed substantially from foreign, namely non-resident, investors in local currencies. This signifies progress towards overcoming the so-called "original sin", namely the inability of a country to borrow abroad in its own currency, which would allow EMEs to mitigate their own exchange rate risks. Such foreign participation in the local-currency (LC) government bond markets can potentially bring additional benefits by greatly enlarging the pool of potential investors, thus reducing the governments' borrowing costs. However, their participation can also possibly destabilise the markets by transmitting shocks to external/global factors through volatile capital flows.

The broad aim of this report is to better understand the mechanism of the spillover effects particularly to emerging economies affiliated with South East Asian Central Banks (SEACEN), and draw some policy insights on how the governments can mitigate possible destabilising impacts while retaining benefits from the foreign participation. To this aim, the innovation of this report is to conduct a country case study of SEACEN economies. This approach has merit as a complement to cross-country analysis that assumes a degree of homogeneity, given that the transmission mechanism is inherently complex, interlinked with various country-specific factors such as bond market structure, regulatory framework, and macroeconomic fundamentals. This report covers the following seven SEACEN economies: Malaysia, Thailand, South Korea, Chinese Taipei, Indonesia, Vietnam, and Cambodia (in the order of appearance).

Altogether, the analyses indicate that foreign investor trading does have the potential to transmit shocks to global factors, such as global risk aversion and external interest rates, to the LC government bond markets of emerging SEACEN economies. However, they also suggest that country-specific factors including the foreign investor composition of the market (e.g., mutual funds vs insurance companies/pension funds), macroprudential policy framework to regulate capital flows, and macroeconomic fundamentals such as foreign exchange reserves may all be interlinked with the spillover effects of global shocks to LC government bond markets. Further, some consistent findings are that foreign mutual funds, in particular, play a key role in transmitting global shocks to LC government bond markets, while expectation of LC depreciation generally has a significant impact on foreign investor trading.

Hence, acknowledging a usual caveat of a case study approach that external validity is rather limited, the analyses suggest the following policy recommendations:

1. It is useful to closely monitor the foreign investor composition, since certain types of investors have a disproportionate impact on the market stability.
2. Relatedly, it is important to diversify the investor base in preparation for the possibility of global shocks, not relying too much on borrowing from foreign mutual funds.
3. It helps to develop macroprudential tools in the form of capital controls on inflows, to manage possible volatility of flows in times of shocks.
4. It appears to matter to strengthen macroeconomic fundamentals, including the accumulation of foreign exchange reserves in normal times.
5. It helps to develop FX derivatives markets, given that foreign investors, rather than domestic governments, face exchange rate risks in the EME LC markets, because they seek to maximise the value of their portfolios measured in foreign currency.

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Foreign Investor Trading and Spillovers to Local-Currency Bond Markets in SEACEN Economies

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This research publication, prepared by The SEACEN Centre, does not necessarily reflect the views and policies of the SEACEN member central banks and monetary authorities.

Notes:

- The SEACEN Centre recognises "China" as People's Republic of China; "Hong Kong" as Hong Kong SAR, China; and "Korea" as Republic of Korea.
- USD and US$ refer to U.S. dollar.

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Chapter 1

SEACEN PROJECT ON FOREIGN INVESTOR TRADING AND SPILLOVERS TO LOCAL-CURRENCY BOND MARKETS IN SEACEN ECONOMIES: A CASE STUDY APPROACH

GENERAL INTRODUCTION

By

Atsuyoshi Morozumi[1]

The **international spillover effects** of external shocks on emerging market economies (EMEs) have been a focus of policymakers and academics. There has been plenty of evidence that a change to factors such as global risk aversion and external interest rates affects those economies' financial markets as well as real economic activity (e.g., Uribe and Yue, 2006, Blanchard et al., 2010, Chudik and Fratzscher, 2011, Akinci, 2013, Ahmed et al., 2017, Hofmann et al., 2020, IMF, 2020, and Ahmed, 2023). About spillover effects on EME financial markets, **local-currency (LC) government bond markets** - the single largest segment of EME bond markets – are no exception. With the governments' borrowing being predominantly in local, as opposed to foreign, currencies in EMEs, external shocks generally have posed a major challenge to sustainable government financing in those economies.

To illustrate such spillover effects to EME LC government bond markets graphically, Figure 1 shows the periodic recurrence of external shocks associated with such episodes as the Global Financial Crisis (GFC), Euro Debt crisis, Taper Tantrum, COVID-19 financial crisis, and the US interest rate hike, all of which were characterised by either a sudden increase in global risk aversion, or a rise in US Treasury 10-year yields. Then, Figure 2 provides suggestive evidence of the transmission of external shocks to LC bond markets in emerging SEACEN economies, by tracking daily changes of the volatility of 10-year LC government bond yields for Indonesia, Malaysia, Thailand, and Philippines over the 2008-2024 period. The volatility, measured by the coefficient of variation of the bond yields over the past 20-working days (i.e., standard deviation of the yields divided by the corresponding mean), tends to increase in times of external shocks. The indication is thus that the external shocks may pose a major challenge to sustainable government financing in EMEs.

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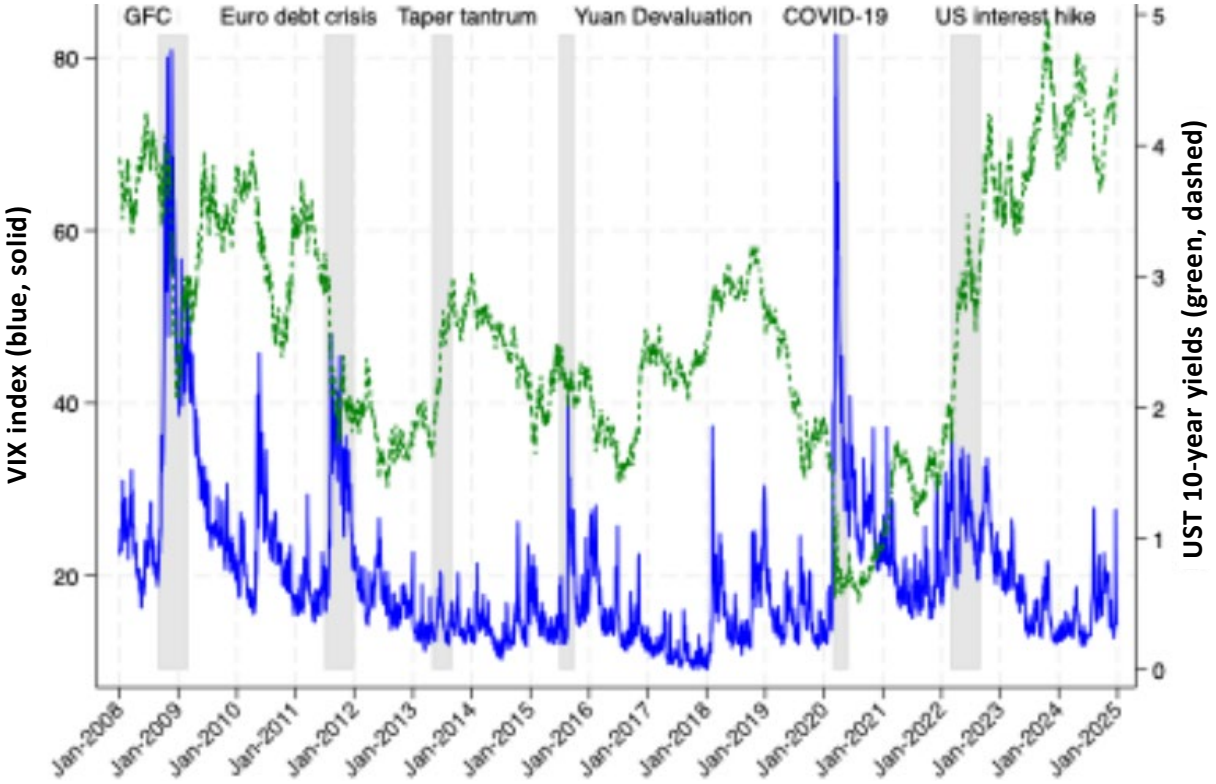
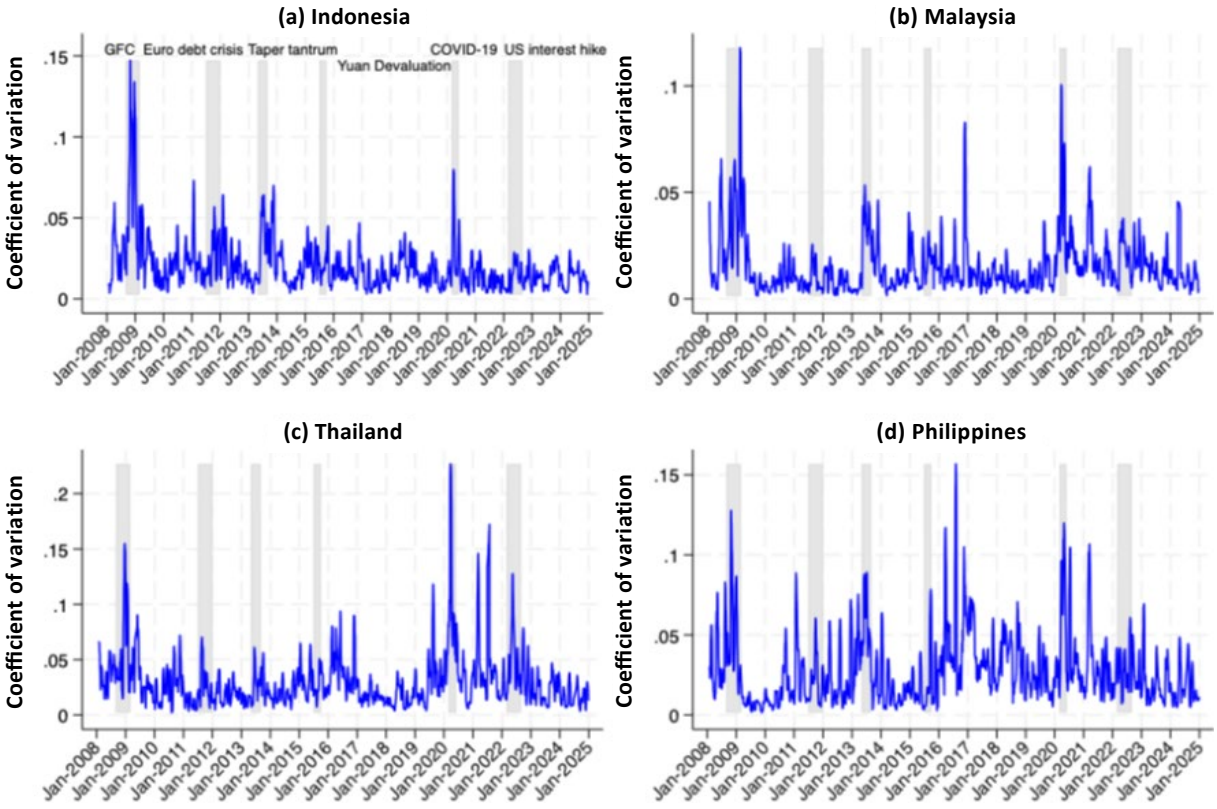
Figure 1: Evolution of External Factors Since the Global Financial Crisis (GFC)



Note: Daily data from 2 January 2008 to 27 December 2024. Global risk aversion is proxied by the VIX index. Grey areas represent notable stress periods of Global Financial Crisis (GFC, September 2008-February 2009), European debt crisis (July-December 2011), Taper Tantrum (May-August 2013), Financial crisis induced by COVID 19 (March-May 2020), and the US interest rate hike (March-August 2022). The dates follow Ahmed et al. (2017) except the COVID-19 financial crisis and the US interest rate hike.
Date source: Bloomberg.

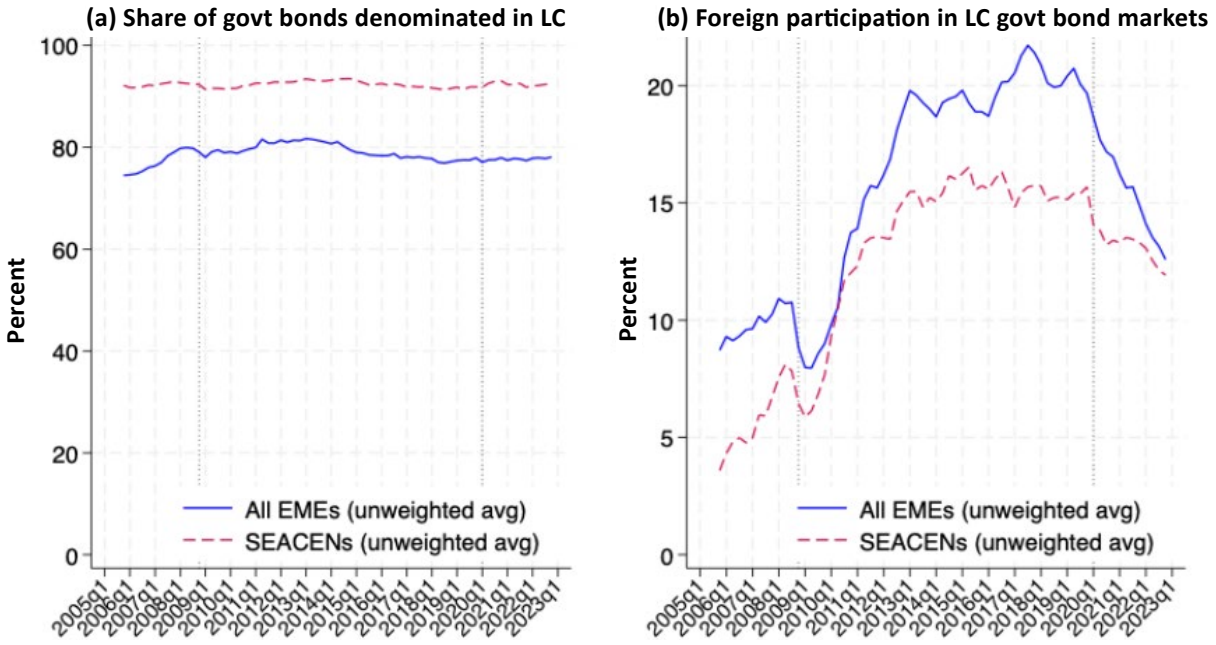
Figure 2: Volatility of LC Bond Yields in Selected Emerging SEACEN Economies



Note: Daily data from 2 January 2008 to 27 December 2024. Grey areas represent notable stress periods as in Figure 1. The volatility of 10-year bond yields is measured by the coefficient of variation (the standard deviation of the yields over the past 20 working days, divided by the corresponding mean over the same duration).
Data source: Bloomberg.

The broad aim of this report is to (1) better understand how external shocks may be transmitted to LC government bond markets of EMEs, particularly **emerging SEACEN economies**, and (2) draw policy implications to mitigate possible destabilising effects. To this aim, our focus is on the role of **foreign (non-resident) investor** trading in the spillover effects, motivated by the following two observations. First, over the last two decades, foreign investors have become significant holders of EME LC government bonds. Figure 3 (a) demonstrates, both for a broad set of EMEs and for the subset of SEACEN economies, that governments have issued bonds predominantly in local currencies. Figure 3 (b) then shows that for both groups, there has been a steady increase in the foreign participation in the LC government bond markets particularly after the GFC, albeit there was a noticeable fall after the outbreak of COVID-19 in 2020 Q1. Second, the related literature (e.g., Arslanalp and Tsuda, 2014) often posits that while foreign participation does bring opportunities by helping reduce borrowing costs for the government, it can also cause instability particularly in times of global shocks. We investigate this argument in the context of the LC government bond markets of particularly SEACEN economies where the foreign participation is generally sizable.

Figure 3: EME LC Long-term Government Bond Markets and Foreign Participations



Notes: Quarterly data from 2006Q1 to 2022 Q4 from Onen et al. (2023), covering 22 EMEs (Argentina, Brazil, Bulgaria, Chile, China, Chinese Taipei, Colombia, Czech Republic, Hungary, India, Indonesia, Israel, Korea, Malaysia, Mexico, Peru, Poland, Romania, Russia, South Africa, Thailand, Turkey), including 7 SEACEN economies (China, Chinese Taipei, India, Indonesia, Korea, Malaysia, Thailand).

The innovation of this report, to fully capture the heterogeneity of the spillover mechanism of global shocks, is to use a **case study approach**, as a complement to cross-country analysis that assumes a degree of homogeneity. Specifically, the country studies provide a better understanding of the ways in which shocks to global factors, together with the specific structure of the domestic financial sector, specific policy actions, and specific macroeconomic fundamentals, may be transmitted to each SEACEN economy. Indeed, this approach is deemed to be effective, because it is often observed that the effects of global shocks on EME financial markets are heterogeneous, with some economies showing stronger resilience than others (e.g., Blanchard et al, 2010, Ahmed et al., 2017, IMF 2020). In what follows, the present report provides case studies for **Malaysia, Thailand, South Korea, Chinese Taipei, Indonesia, Vietnam, and Cambodia** (in the order of appearance). The short summary of each chapter of this report will be as follows.

Chapter 2 highlights the heterogeneous nature of foreign investor behaviour across a **broad set of emerging market economies (EMEs)**. Thus, this chapter is meant to set the scene for the subsequent case studies. Briefly, the chapter does two things. First, it provides stylised facts about heterogeneous foreign investor trading in the LC bond markets over the recent episodes of global shocks such as the Global Financial Crisis (GFC) of 2008-09, Taper Tantrum of 2013, and COVID-19 financial crisis of 2020, and the US interest rate hikes of 2022. Second, using a Mean Group approach of Pesaran and Smith (1995), whereby separate autoregressive distributed lag (ARDL) models are estimated for each economy and the average of each parameter is taken, the chapter illustrate formally

that while on aggregate, there is a significant relationship between global factors and foreign investors' net purchases of EME LC bonds, there is important heterogeneity in the relationship across EMEs.

Chapter 3 is the SEACEN economy case study of **Malaysia**. The chapter first reports a growing foreign participation in Malaysia's LC government bond market since early 2000s. It also highlights that there has been a diverse mix of foreign investors with varying investment profiles. The chapter, using an ARDL approach, assesses how foreign investors in the LC government bond market react to external shocks, and how responses may differ across different types of investors. It finds that while foreign investors, in general, do not significantly react to changes to global risk aversion and external interest rates, foreign asset managers (e.g., mutual funds), in particular, react significantly to changes to such external factors. It also emphasises that all major types of foreign investors significantly react to expected LC (ringgit) depreciation. Accordingly, policy implications drawn are that it is important to (1) enhance market resilience through investor base diversification, e.g., by attracting participation from long-term, stable investors such as insurance companies and pension funds, and (2) support foreign investors' risk management by promoting access to liquid FX hedging instruments.

Chapter 4 is the case of **Thailand**. Similar to the previous case study of Malaysia, the chapter primarily investigates drivers of foreign capital flows to the country's LC bond markets. The analysis also adopts an ARDL approach, examining how global factors such as global risk aversion and the US interest rates, and macroeconomic fundamentals affect the trading of foreign investors, measured by their net purchases of the LC government bonds. Specifically, this chapter, taking advantage of the availability of high-frequency data on the foreign investor trading over the 2012-24 period, compares external (i.e., push) and domestic (i.e., pull) factors as a driver of foreign capital flows across different frequencies, namely weekly and monthly frequencies. Results suggest that both for weekly and monthly models, global risk aversion, external interest rates, and expected depreciation rates are key drivers of foreign investors' net purchases, while the country's macroeconomic fundamentals as a pull factor play a rather insignificant role.

Chapter 5 turns to the case of **South Korea**. The chapter first observes that since the start of the 21st century, the South Korean LC government bond market has typically been less susceptible to shocks to global factors compared to the other SEACEN economies. Notably, even during the COVID-19 induced financial crisis of March 2020, when many other SEACEN economies experienced substantial capital outflows, foreign investors rather increased their holdings of South Korean LC government bonds. Acknowledging this apparent resilience to global shocks, the chapter investigates factors behind the resilience. One factor suggested is the composition of foreign investors participating in the market. The argument is that while (foreign) central banks, sovereign wealth funds, and public pension funds account for the majority of foreign holdings of Korean won government bonds, they tend to pursue long-term, diversified strategies, rather than engaging in short-term trading, thereby not causing significant instability even in times of market stress.

The chapter also discusses the roles of FX derivatives market, along with macroprudential policies including the abolition of tax incentives for foreign investors implemented in January 2011, to explain the relative stability of the LC government bond market.

Chapter 6 looks at the case of **Chinese Taipei**. Examining the evolution of foreign participation into its LC government bond market, the chapter observes a pattern that is different from the general trend in other EMEs. For example, after 2011 until 2015 there was a gradual decline in the participation in Chinese Taipei's LC bond market, whereas in other EMEs the foreign capital inflows gradually increased in relation to the then very low interest rates in advanced economies. Further, since 2015 the foreign participation in the LC government bonds has been negligible in Chinese Taipei, in fact, less than 1% of the bonds outstanding. Considering factors behind the unique evolution of the foreign participation, the chapter points out the relevance of the government's capital control policies, including the one in November 2010 whereby the cap was imposed on foreign holdings of the LC government bonds of all maturities. The chapter, examining factors that might have affected foreign participation before 2015, also suggests that foreign participation was inversely associated with the expected depreciation of the New Taiwan dollar, while it is not related to global factors such as global risk aversion and the US interest rates. The chapter also indicates the relevance of foreign exchange reserves as a factor affecting the foreign participation.

Chapter 7 turns to the case of **Indonesia**, examining the consequences, rather than drivers, of foreign investor trading in the LC government bond market. Specifically, the chapter, using a local projection method, studies the dynamic effects of the foreign investors' net purchases of its LC government bonds on the yields (thus prices) under an environment with high, as opposed to low, global risk aversion. The hypothesis tested here is that, when global risk aversion is high, foreign mutual funds, in particular, may sell the LC bonds at heavily discounted prices, i.e., fire sale prices, thereby affecting the market price. The rationale is that mutual funds are inherently subject to liquidity mismatch whereby they have much more liquid liabilities than assets. Thus, to the extent that end investors ask for redemption under a high global risk aversion environment, fund managers, who are under liquidity challenges, may need to conduct fire sales of the bonds. Overall, the chapter indicates the importance of considering the composition of foreign investors in understanding their role in the international transmission of global shocks to the EME LC government bond markets.

Chapter 8 examines the case of **Vietnam**. More precisely, however, with foreign investor trading data for Vietnam being rather limited, the chapter broadly considers the case of ASEAN 5 LC government bond markets, covering Vietnam, together with Indonesia, Malaysia, Philippines, and Thailand. The chapter examines both drivers and effects of foreign participation in the markets, measured by the share of LC bonds held by foreign investors. Using Fully Modified OLS and Dynamic OLS, the chapter illustrates that in the long-run higher US interest rates, as an external factor, robustly discourage foreign participation in the LC bond markets, whereas higher domestic inflation rates increase

their participation. A depreciation of the LC is shown to be negatively associated with foreign investor participation. Meanwhile, the chapter shows that in the long-run greater foreign holdings of LC bonds lead to lower LC bond yields in the ASEAN 5 economies, suggesting the long-run benefit of the foreign participation.

Chapter 9 considers the case of **Cambodia**, a country in transition that now needs to strengthen its capacity and diversify financing sources to meet public investment needs. Against this background, the chapter first elaborates on the current state of the country's LC government bond market that was launched only recently in late 2022. The secondary market is still under development, and there is neither trading nor foreign participation yet. The chapter then explains an existing two-phased policy framework that has been designed to develop the system for issuance and trading of government securities, whereby in the second phase from 2027 to 2028, the country is preparing for possible issuance of bonds abroad. Accordingly, after conducting a detailed literature review on the benefits and costs of foreign investor participation into EME bond markets, the chapter draws lessons from the experiences of several other SEACEN economies, including Indonesia, Malaysia, Thailand, and Vietnam, to better prepare for possible spill-over effects of global shocks in the future. The key policy considerations derived, with a view to making the most of foreign participation in the bond markets, include continuing to develop sound regulatory framework and robust infrastructures; developing FX derivatives market; introducing managing tools for capital flow volatility; diversifying the investor base; and strengthening macroeconomic fundamentals.

References

Ahmed, R. (2023). Flights-to-safety and macroeconomic adjustment in emerging markets: The role of U.S. monetary policy. *Journal of International Money and Finance*, 133, 1–31.

Ahmed, S., B. Coulibaly, & A. Zlate. (2017). International financial spillovers to emerging market economies: How important are economic fundamentals?. *Journal of International Money and Finance*, 76, 133–152.

Akinci, Ö. (2013). Global financial conditions, country spreads and macroeconomic fluctuations in emerging countries. *Journal of International Economics*, 91, 358–371.

Arslanalp, S. & T. Tsuda. (2014). Tracking global demand for emerging market sovereign debt. IMF Working Paper 14/39.

Blanchard, O. J., M. Das, & H. Faruqee (2010). The initial impact of the crisis on emerging market countries. *Brookings Papers on Economic Activity*, 41, 263–323.

Chudik, A. and M. Fratzscher. (2011. Identifying the global transmission of the 2007-2009 financial crisis in a GVAR model. *European Economic Review*, 55, 325–339.

Hofmann, B., I. Shim, & H. S. Shin. (2020). Emerging market economy exchange rates and local currency bond markets amid the Covid-19 pandemic. BIS Bulletin No. 5.

IMF .(2020). Global financial stability report: Markets in the time of COVID-19. International Monetary Fund, Washington, DC, April.

Onen, M., H. S. Shin, & G. Von Peter.(2023). Overcoming original sin: Insights from a new dataset. BIS Working Papers No 1075.

Pesaran, M. H. & R. P. Smith. (1995). Estimating long-run relationships from dynamic heterogeneous panels. *Journal of Econometrics*, 68, 79–113.

Uribe, M. & V. Yue. (2006. Country spreads and emerging countries: Who drives whom?. *Journal of International Economics*, 69, 6–36.

Chapter 2

EMERGING MARKET ECONOMIES AND THE HETEROGENEOUS IMPACTS OF GLOBAL FACTORS ON FOREIGN INVESTOR TRADING

By
Atsuyoshi Morozumi

1. Introduction

As Chapter 1 elaborated, the broad aim of this report is to explore how foreign investor participation may transmit global shocks to the emerging SEACEN economies' local-currency (LC) government bond markets - the single largest segment of their bond markets. To fully reflect the linkage to country-specific elements regarding domestic financial sector, policy actions, and macroeconomic fundamentals, this report primarily adopts a country case study approach as a complement to cross-country analysis that assumes a degree of homogeneity.

In this chapter, as a way of motivating the usefulness of a case study approach, we illustrate substantial heterogeneity in reactions of foreign investors to global shocks across a broad set of emerging market economies (EMEs), going beyond emerging SEACEN economies. To clarify at the outset, this chapter does not aim to provide a deep insight on why such heterogeneity may exist. The question is considered through the course of the remaining chapters via case studies. Simply put, the aim of this chapter is to set the scene for the subsequent chapters.

To this aim, the present chapter first describes how foreign capital flows to EME government bond markets evolved differently over some notable global shock episodes such as Global Financial Crisis (GFC) of 2008-09, the Taper Tantrum episode of 2013, the COVID-19 induced financial crisis of 2020, and the US interest rate hike of 2022. Then, we run heterogeneous panel regressions to examine the relationship between global factors and foreign investment flows. Specifically, we use a Mean Group (MG) approach of Pesaran and Smith (1995), whereby separate autoregressive distributed lag (ARDL) models are estimated for each economy and the average of each parameter is taken. The idea here is to estimate long-run relationships between global factors and foreign investor trading, while demonstrating how relationships may differ across EMEs.

Results from the MG analysis show that, consistent with prior literature (e.g., Koepke, 2019 for a useful summary), adverse shocks to global risk aversion and US long-term interest rates are generally a powerful push shock that drives a surge in portfolio debt outflows due to a significant increase in foreign investors' net sales of EME LC bonds.

However, we also show that impacts of the global shocks on foreign investor trading in LC government bond markets are highly heterogenous, regardless of whether a broad set of EMEs or a narrower set of emerging SEACEN economies are considered. Overall, the chapter motivates the usefulness of country case studies that fully take account of the relevance of country-specific factors, rather than assuming homogeneity across them.

2. Foreign Investors' Net Purchases of LC Government Bonds Across EMEs

First, we describe how foreign investor trading in a broad range of EME LC government bond markets has evolved. The key source of data on foreign investor trading here is flows (net purchases) of LC long-term government bonds from Onen et al. (2023). Data are quarterly, covering 22 EMEs for the 2006Q1 - 2022Q4 period.[1]

The EMEs include 7 emerging SEACEN economies: China, Chinese Taipei, India, Indonesia, Korea, Malaysia, and Thailand. In what follows, we calculate the z-score for each economy as a deviation of 4-quarter moving average of net purchases from the sample mean, divided by the standard deviation, to demonstrate how the foreign investor trading pattern may differ across the economies (cf. Arslanalp and Tsuda, 2014).

First, however, to consider the evolution of *aggregate* net purchase of LC long-term bonds by foreign investors, Figure 1 reports z-scores of the sum of net purchases of LC long-term bonds over 20 EMEs, excluding Chile and Romania due to limited data. A number in a cell shaded red, being negative, represents net sales (relative to historical norms), whereas a number in a cell shaded green, being positive, denotes net purchases. The year-quarter combinations highlighted in yellow correspond to quarters when some notable global shocks were in place, namely the GFC (2008Q4 and 2009 Q1), Taper Tantrum (2013 Q2 and Q3), COVID-19 (2020 Q1 and Q2), and US interest rate hike (2022 Q2 and Q3). As expected, there is a tendency of net sales, namely debt capital outflow in those periods, except that the period of Taper Tantrum only shows a decrease in net purchases relative to the prior periods.

1. Those 22 EMEs are Argentina, Brazil, Bulgaria, Chile, China, Chinese Taipei, Colombia, Czech Republic, Hungary, India, Indonesia, Israel, Korea, Malaysia, Mexico, Peru, Poland, Romania, Russia, South Africa, Thailand, Turkey.

Figure 1: Aggregate Net Purchase of LC Long-term Bonds by Foreign Investors

Y2006Q4	Y2007Q1	Y2007Q2	Y2007Q3	Y2007Q4	Y2008Q1	Y2008Q2	Y2008Q3	Y2008Q4	Y2009Q1
-0.1	-0.1	0.1	0.0	0.0	0.1	0.0	-0.1	-0.6	-0.8
Y2009Q2	Y2009Q3	Y2009Q4	Y2010Q1	Y2010Q2	Y2010Q3	Y2010Q4	Y2011Q1	Y2011Q2	Y2011Q3
-0.7	-0.4	0.1	0.4	0.4	0.6	0.7	0.7	0.9	0.3
Y2011Q4	Y2012Q1	Y2012Q2	Y2012Q3	Y2012Q4	Y2013Q1	Y2013Q2	Y2013Q3	Y2013Q4	Y2014Q1
0.1	0.2	-0.1	0.5	0.7	0.6	0.5	0.3	0.0	-0.1
Y2014Q2	Y2014Q3	Y2014Q4	Y2015Q1	Y2015Q2	Y2015Q3	Y2015Q4	Y2016Q1	Y2016Q2	Y2016Q3
0.4	0.2	0.0	-0.2	-0.5	-1.0	-0.7	-0.5	-0.4	0.3
Y2016Q4	Y2017Q1	Y2017Q2	Y2017Q3	Y2017Q4	Y2018Q1	Y2018Q2	Y2018Q3	Y2018Q4	Y2019Q1
-0.1	0.1	0.2	0.3	0.6	0.6	0.0	-0.3	-0.3	-0.5
Y2019Q2	Y2019Q3	Y2019Q4	Y2020Q1	Y2020Q2	Y2020Q3	Y2020Q4	Y2021Q1	Y2021Q2	Y2021Q3
0.2	0.0	0.3	-0.8	-0.8	-0.4	0.1	1.0	1.1	0.9
Y2021Q4	Y2022Q1	Y2022Q2	Y2022Q3	Y2022Q4					
0.3	0.2	-0.6	-1.2	-1.1					

Note: Red: Size of net sales (relative to historical norms); Green: Size of net purchases.

Next, Figure 2, focusing on those 4 stress periods, illustrates heterogeneity in the z scores of net purchases across a broad set of EMEs. Considering emerging SEACEN economies, while a country such as (South) Korea shows a distinct increase in net sales during the GFC (2008Q4 and 2009 Q1), an economy like Chinese Taipei shows an opposite pattern of net purchases during the same period. Meanwhile, even during the COVID-19 period when several countries including Thailand and Indonesia experienced a large capital outflow, there is a noticeable heterogeneity, with, say, China and Korea rather experiencing capital inflows. The same observation can be made for the period of the US interest rate hike (2022 Q2 and Q3), during which a country such as Indonesia experienced a large outflow, while the opposite was the case in Korea.

Figure 2: Heterogeneity in Net Purchases Across EMEs for Selected Episodes

	Global Financial Crisis		Taper Tantrum		COVID-19		US interest rate hike	
country	Y2008Q4	Y2009Q1	Y2013Q2	Y2013Q3	Y2020Q1	Y2020Q2	Y2022Q2	Y2022Q3
Total	**-0.6**	**-0.8**	**0.5**	**0.3**	**-0.8**	**-0.8**	**-0.6**	**-1.2**
Argentina	-0.2	-0.2	-0.1	-0.1	0.1	-0.6	0.3	0.1
Brazil	-0.1	-0.3	0.2	0.7	-1.2	-1.5	-0.1	-0.4
Bulgaria	0.0	-0.7	0.1	0.2	0.1	0.1	0.0	-0.1
Chile			0.0	0.0	0.1	-0.5	0.6	-0.3
China	-0.5	-0.5	-0.4	-0.2	0.9	1.0	0.3	-0.7
Chinese Taipei	0.9	1.1	-1.0	-1.0	0.4	0.4	-0.1	-0.2
Colombia	-0.6	-0.6	-0.1	0.0	-1.1	-1.0	-0.7	-0.6
Czech Republic	-0.4	-0.6	0.0	-0.2	-0.2	0.4	-2.2	-1.6
Hungary	-1.0	-1.1	0.7	0.1	0.0	-0.4	-0.5	-0.8
India	-0.1	-0.2	0.4	0.2	-0.7	-1.5	-0.4	-0.5
Indonesia	-0.2	-0.3	0.2	0.2	-0.5	-0.8	-1.8	-2.1
Israel	-0.4	-0.4	0.1	-0.5	-0.4	0.6	-0.5	-0.6
Korea	-1.0	-1.1	-0.5	-0.8	0.8	0.6	1.3	1.1
Malaysia	-0.4	-0.8	0.4	-0.1	-0.4	0.0	-0.1	-0.3
Mexico	-0.1	-0.2	0.7	0.5	-0.1	-0.5	-1.3	-1.1
Peru	-0.3	-0.5	0.0	0.0	0.3	-0.2	0.1	-0.8
Poland	-0.7	-0.5	0.7	0.4	-0.9	-1.3	0.6	0.5
Romania					0.2	0.2	-0.6	0.4
Russia	-0.2	-0.2	0.7	0.5	1.1	0.6	-0.5	-1.1
South Africa	-0.3	-0.4	0.5	0.5	-0.5	-1.1	-0.4	-0.2
Thailand	-0.1	-0.2	1.1	0.6	-1.1	-1.2	0.1	-0.1
Turkey	-0.2	-0.3	1.2	0.5	-0.8	-1.3	-1.4	-1.6

3. Heterogeneous Panel Analysis

3.1 Regression Model

To consider the heterogeneous reaction of foreign investor trading across EMEs more formally, we now use a Mean group (MG) approach (Pesaran and Smith, 1995). In this approach, separate autoregressive distributed lag (ARDL) models are estimated for each economy, and the average of each parameter is taken. The advantage of an ARDL model, where both dependent and independent variables are included in the right-hand side with lags, is that it allows for a process diverging from the equilibrium (long-run) relation in the short-run.

Specifically, re-parameterising the model into an error-correcting (EC) form, we have:

$$\Delta Y_{i,t} = c_{0,i} - \alpha_i\left(Y_{i,t-1} - \boldsymbol{\theta}_i \boldsymbol{X}_{i,t-1}\right) + SR_{dynamics_i} + \varepsilon_{i,t} \quad (1),$$

where i indicates the EME, and t is quarter. Y is a net purchase ratio, defined as foreign investors' net purchase of long-term LC bonds divided by the initial holdings (in the previous quarter). $\boldsymbol{X}$ contains global factors in the first difference.[2] In line with the prior literature, we here consider global risk aversion, proxied by the VIX index, and external (particularly the US) long-term interest rates as a global factor. Further, since our focus here is on local-currency denominated bonds, we also consider the possible role of expected depreciation rates against US dollars as part of $\boldsymbol{X}$.[3] α is a speed-of-adjustment coefficient, reflecting the speed at which the process for Y reverts to its equilibrium relationship. Our main interest is to estimate equilibrium relationships between the net purchase ratio and a change in global factors, i.e., $\boldsymbol{\theta}$.

At the same time, since in the MG approach separate ARDL models are estimated for each economy (and the average of each parameter is taken), we are also interested in the distribution of the equilibrium coefficients. For example, considering global risk aversion as a global factor, a hypothesis would be that when foreign investors become more sensitive to default risks entailed in EME LC government bonds, their demand for bonds (thereby their holdings) may fall, suggesting that foreign investors' net purchase of bonds (as a flow variable) is negatively associated with a change in global risk aversion. However, to the extent that some EMEs are more resilient to a change in global risk aversion than others (due to some country-specific factors), the relationship should be heterogeneous, reflected in a possibly wide distribution of the coefficients.

2. The reason why we consider the first difference is that we view global factors such as the level of global risk aversion and external interest rates as a shifting factor of foreign investors' demand for EME LC government bonds. For example, for given price of EME LC bonds, we may hypothesise that a rise in global risk aversion may reduce foreign investors' demand for the bonds (thereby holdings), because they are now more sensitive to the default risk entailed in EME bonds. Hence, when we consider foreign investors' net purchases (which are a flow concept) as opposed to their holdings (a stock concept), we can naturally motivate a relationship between net purchases and a "change" in global factors.

3. Expected depreciation rate is proxied by forward points divided by spot rates (obtained from Bloomberg).

The data source here is again quarterly data from Onen et al. (2023). The period considered is between 2006Q1 and 2022Q4 for 22 EMEs including 7 SEACEN economies (China, Chinese Taipei, India, Indonesia, Korea, Malaysia, Thailand). To note, the mean of the net purchase ratio is 6.90%, while the standard deviation is much greater (33.91), indicating the volatile nature of foreign investors' trading in EME LC government bond markets.

3.2 Results

Table 1 presents the estimation results of Eq. (1), highlighting the equilibrium (long-run) coefficients. Column (1) ((2)) considers the ARDL model that includes 1 (2) lags of dependent and independent variables. In both columns, a greater increase in the VIX index is negatively associated with lower net purchases of EME LC government bonds by foreign investors. Likewise, a greater increase in the US Treasury 10-year rates is associated with lower net purchases of LC bonds, whereas greater expected depreciation rates (against US dollars) are also related to lower net purchases. The indication is thus that *on average* those global factors significantly drive foreign investor trading in EME LC government bond markets.

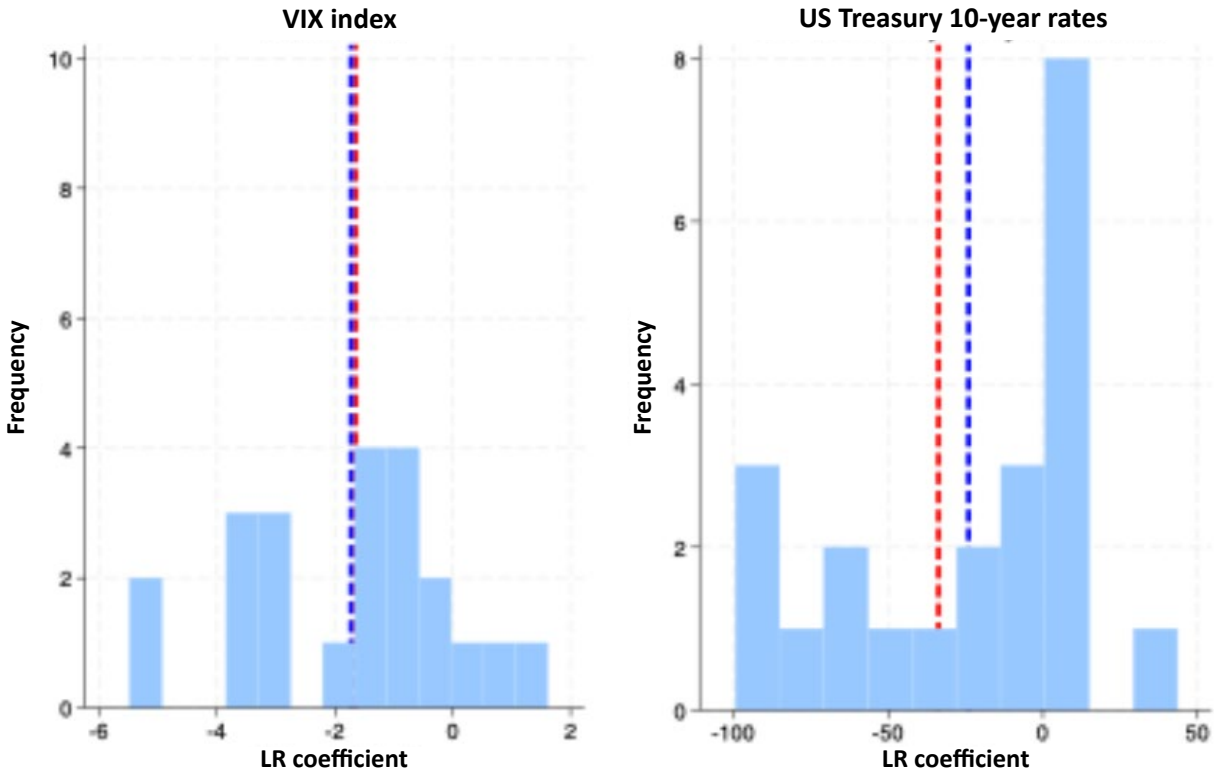
Table 1: Equilibrium Coefficients from MG Estimations

Lag structure	1 lag	2 lags	1 lag
	(1)	(2)	(3)
Equilibrium (long-run) relations with net purchase ratios			
ΔVIX	-1.73***	-2.72***	-1.60***
	(0.39)	(0.87)	(0.37)
ΔUST 10 yr yields	-24.01***	-26.71***	-21.44**
	(8.76)	(10.18)	(8.89)
ΔExp. IDR depreciation	-91.52**	-119.40*	-100.13**
	(38.76)	(61.84)	(48.35)
ΔReserve/GDP			52.27
			(37.34)
EC coefficient ($-\alpha$)	-0.77***	-0.76***	-0.79***
	(0.05)	(0.05)	(0.05)
Observations	1405	1382	1296
No. of countries	22	22	21

Note: MG estimations of a variant of Eq. (1). Short-run coefficients are not shown for brevity. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The results in Columns (1) and (2) are intuitive, since it is reasonable to assume that foreign investors, relative domestic investors, are more sensitive to a change in global risk aversion, US Treasury interest rates (as a proxy for riskless interest rates), and expected weakening of EME local currencies. Column (3) adds a change in the ratio of foreign exchange reserves to GDP to the model as a macroeconomic fundamental. While the results on VIX, US treasuries, and expected depreciations are robust, on average the coefficient on reserves is not significant, though positive (as expected).

Figure 3: Heterogeneous Reaction of Net Purchases to External Shocks Across EMEs



Note: Blue dashed vertical line: Mean-group coefficient (EME average effect from Column (1) of Table 1); Red vertical line: SEACEN average.

Figure 3 demonstrates the *heterogeneous* nature of the equilibrium relationships particularly for the global factors of the VIX index and US Treasury rates. In each sub-figure, the blue vertical (dashed) line represents the Mean-group coefficient as an average of the coefficients of all the 22 EMEs, as shown in Column 1 of Table 1. Meanwhile, the red vertical line is the average of the coefficients particularly for the seven SEACEN economies. Hence, a take-away message from the figures is that while the average (of both the entire EMEs and SEACEN economies) is negative as expected, there is substantial heterogeneity in the size (and even the sign) of the coefficients across the economies, suggesting that their LC government bond markets are different in terms of resilience to shocks to global factors.

4. Limitations

As mentioned, the present chapter's aim is simply to suggest the heterogeneous response of foreign investors across different EME LC government bond markets. To this aim, the priority was to include as many EMEs as possible into the analysis while covering a long-enough period that spans notable global stress periods such as the GFC and the COVID-19 financial crisis. By achieving this priority, however, the current chapter likely missed the complexity and richness of international spillover effects on EME LC government bond markets via foreign investor trading.

Specifically, we argue that consideration of the following points would enhance understanding of the international spillover effects and the role of foreign investors.

1. *Higher frequency data*. The present chapter uses quarterly data. However, since financial variables move fast particularly in the periods of market stress (cf. Chapter 1), the use of higher frequency data, such as daily, weekly, or monthly data, is potentially beneficial.

2. *Composition of foreign investors*. Although it is well known that foreign investors' behaviour differs across their types (e.g., foreign mutual funds vs insurance companies/ pension funds), it is challenging to decompose foreign investors by type in the context of panel data that encompass a broad set of EMEs.

3. *Different policy reactions and regulations*. Since destabilising effects of capital flows are widely known, different EMEs have implemented different sets of policies and regulations to mitigate possible adverse impacts, including exchange rates, monetary, and macroprudential policies.

4. *Benchmark-driven investments*. Since benchmark-driven investors who are guided by the country weights in a benchmark index (e.g., J.P. Morgan's Government Bond Index – Emerging Markets) are known to be sensitive to global factors (Arslanalp et al., 2020), variations in weights are likely to be relevant.

5. *Different macroeconomic fundamentals*. Countries differ in various aspects of macroeconomic fundamentals, including foreign exchange reserves, short-term external debt, and inflation rates. A fuller consideration of fundamentals would be useful to shed light on how they may affect foreign investor trading.

The following chapters, adopting a country case study approach, do touch on several of the above points to enrich the investigation of the international spillover effects of external shocks on LC government bond markets of emerging SEACEN economies.

5. Concluding Remarks

This chapter indicates that shocks to global factors have heterogeneous impacts on foreign investor trading in EME LC government bond markets. While, on average, global risk aversion, US interest rates, and expected depreciation of local currencies matter for foreign net purchases of the LC government bonds, the effects are heterogenous across a broad set of EMEs. The findings are motivating the usefulness of country case studies in the subsequent chapters to better capture an interlinkage to various country-specific elements.

References

Arslanalp, S., D. Drakopoulos, R. Goel, & R. Koepke. (2020). Benchmark-driven investments in emerging market bond markets: Taking stock. IMF Working Paper, 20/192.

Arslanalp, S. & T. Tsuda. (2014). Tracking global demand for emerging market sovereign debt. IMF Working Paper, 14/39.

Koepke, R. (2019). What drives capital flows to emerging markets? A survey of the empirical literature. *Journal of Economic Surveys*, 33, 516–540.

Onen, M., H. S. Shin, & G. Von Peter, (2023). Overcoming original sin: Insights from a new datase. BIS Working Papers No 1075.

Pesaran, M. H. & R. P. Smith. (1995). Estimating long-run relationships from dynamic heterogeneous panels. *Journal of Econometrics*, 68, 79–113.

Chapter 3

MALAYSIA AND THE HETEROGENOUS SPILLOVERS FROM GLOBAL SHOCKS TO THE LOCAL CURRENCY GOVERNMENT BOND MARKET[1]

By

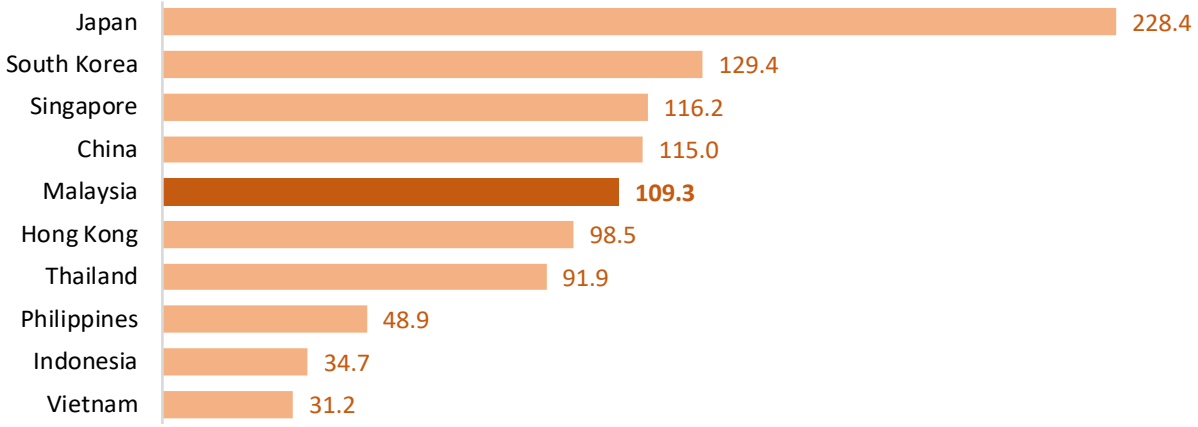
Akmal Zulkarnain, Lim Chia Xin, Hazrul Akmal Hazarudin, Adam Fadhli Abdul Razak and **Muhammad Alif Iman Asmal**

1. An Overview of the Malaysian Local Currency Bond Market

1.1 Background

Over the past few decades, Malaysia has made significant progress in developing a well-established and sizable domestic bond market. As of December 2024, the Malaysian local currency (LCY) bond market stood as one of the largest among its peers, accounting for approximately 109.3% of its Gross Domestic Product (GDP) (Figure 1). This positions Malaysia's LCY bond market to be almost on par, in terms of total outstanding bonds, with China and Singapore, while trailing closely behind South Korea. The size of the LCY bond market can be attributed to an enabling environment underpinned by sustained macroeconomic stability and strong regulatory framework, further supported by progressive and inclusive financial market policies (World Bank, 2020).

Figure 1: Size of LCY Bond Markets Across Selected Peers, *% of GDP*

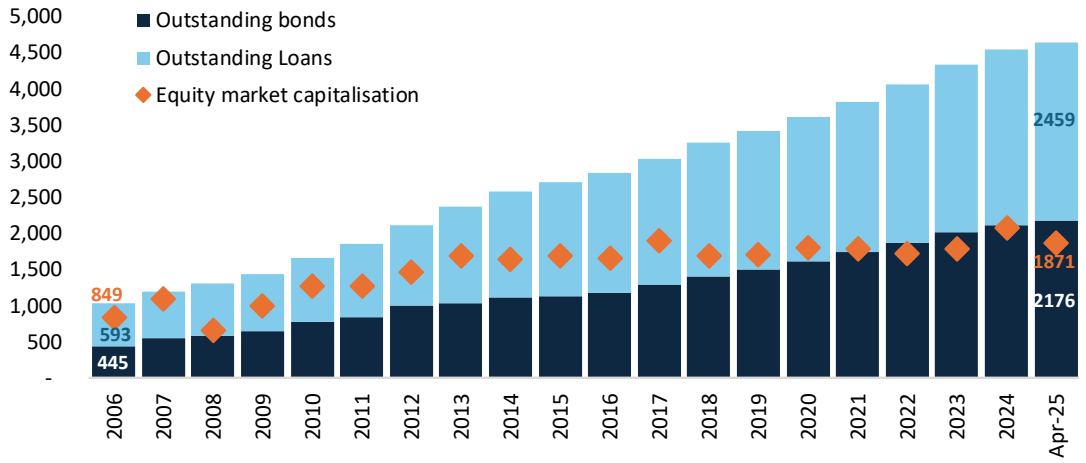


** Data as at end-December 2024.*
Source: Bank Negara Malaysia, AsianBondsOnline.

1. Any views expressed are solely those of the authors and should not be taken to represent those of Bank Negara Malaysia. Correspondence: akmal.zulkarnain@bnm.gov.my and chiaxin@bnm.gov.my. The authors would like to thank Mohd Helmi bin Ramlee, Dr Mohamad Hasni bin Sha'ari and Azizul Sabri bin Abdullah for their invaluable views and contributions throughout the study.

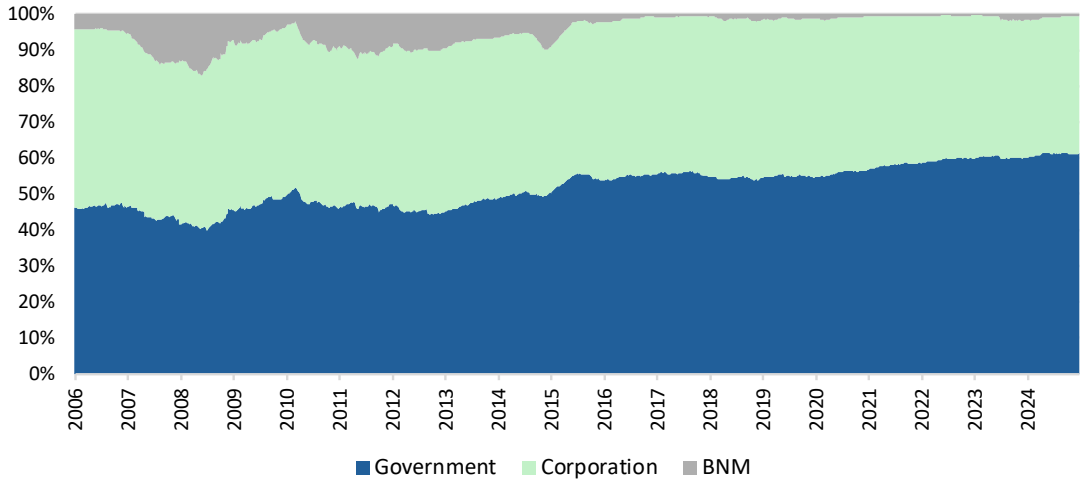
Prior to year 2000, the main source of financing was provided by banks, particularly to meet working capital requirements. While equity markets initially supported private sector growth, local currency bonds have grown in prominence as a source of financing over time. In fact, the value of total outstanding bonds began surpassing total domestic equity market capitalisation in 2021 (Figure 2). The total outstanding LCY bonds comprise a relatively balanced composition, with government securities accounting for around 60% and corporate bonds at 40%. This ratio has remained broadly stable during the post-COVID period (Figure 3).

Figure 2: Source of Financing in Malaysia, *RM billion*



Source: Bank Negara Malaysia, Bursa Malaysia.

Figure 3: Share of Government[2] vs. Corporate-issued Bonds, *%*



Note: Government securities include MGII, MGS, SPK, MTB and MITB.
Source: Bank Negara Malaysia.

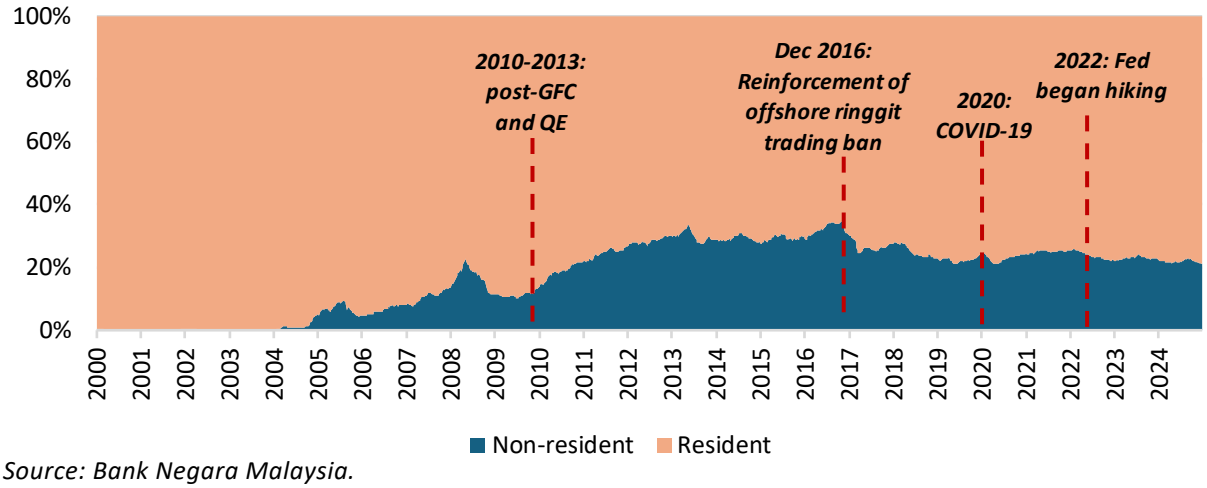
2. For the purposes of our analysis, "government bonds" include the Malaysian Government Securities (MGS), the Malaysian Government Investment Issues (MGII) and *Sukuk Perumahan Kerajaan* (SPK). Other government issuances, such as the Malaysian Treasury Bills (MTB) and Malaysian Islamic Treasury Bills (MITB), while are typically included in the standard definition of "government securities" in Malaysia, are excluded from our empirical study given their relatively much smaller proportion.

As at the end of March 2025, the total government's outstanding debt is predominantly denominated in the local currency, i.e., the Malaysian ringgit, with Malaysian Government Securities (MGS) and Malaysian Government Investment Issue (MGII) forming the bulk of the issuance. Foreign currency-denominated debt remains low at just 2.2% of total outstanding federal government debt (2010 – 2019 average: 3.4%), which helps limit the government's exposure to foreign exchange (FX) risk.[3]

1.2 Non-Resident Participation in the LCY Government Bond Market

Non-resident (NR) participation in Malaysia's LCY government bond market began rising steadily in the early 2000s, following a series of market liberalisation measures introduced by Bank Negara Malaysia (Figure 4). While NR holdings initially accounted for a modest share of the market, their presence gradually expanded, reaching around 20% just prior to the Global Financial Crisis (GFC) in 2008. Post-GFC, NR participation surged further, driven by the implementation of Quantitative Easing (QE) programmes in Advanced Economies (AEs), which significantly compressed global yields (IMF, 2014). Against this backdrop, Malaysia stood out as an attractive destination, offering a positive yield differential relative to AEs. This yield advantage was underpinned by the country's stable A- sovereign credit rating[4] and relatively deep secondary markets (IMF, 2018; Sahay et al., 2015). At the same time, the inclusion of MGS in several global bond indices – the FTSE Russell World Government Bond Index, Barclay's Global Aggregate Index, among others – has attracted greater foreign investor interest in Malaysia's sovereign debt. Consequently, the share of NR holdings climbed to a peak of 35% in November 2016.

Figure 4: Share of Daily Nominal Holdings of Select Government Securities (MGS + GII +SPK) by Residency, %



Source: Bank Negara Malaysia.

3. Foreign currency borrowings by the federal government are governed by the External Loans Act 1963, which allows such borrowings only for development purposes and with parliamentary approval. Additionally, Statute Paper 77 of 2009 imposes an administrative limit of RM35 billion on foreign currency debt, reinforcing a prudent approach to managing external debt exposure.

4. Based on Standard & Poor's sovereign credit rating for Malaysia.

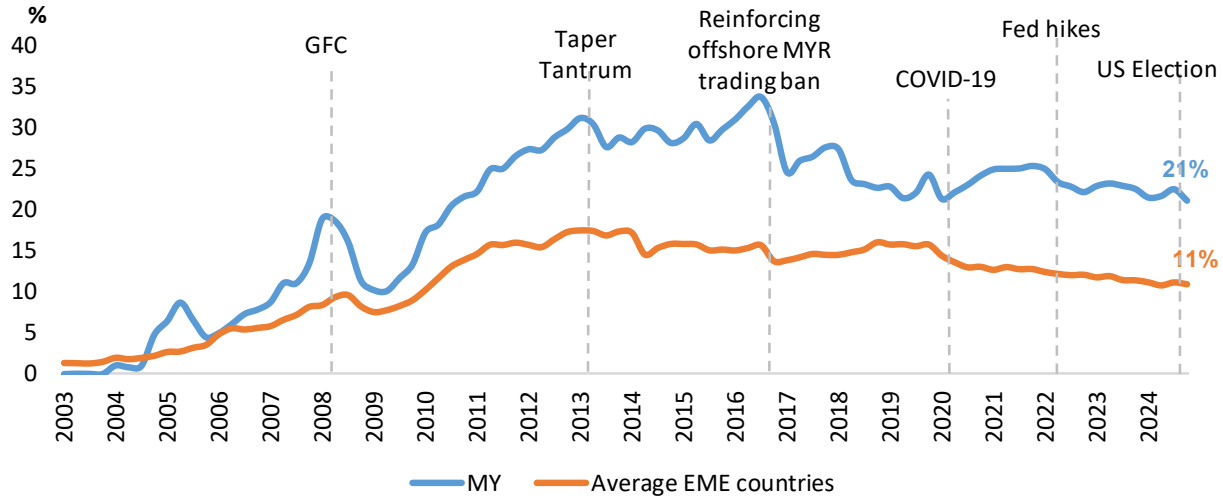
The influx of foreign capital during this period played a constructive role in deepening and broadening the domestic bond market. However, it also introduced a new dimension of external vulnerability. In particular, the presence of NR participation also increased domestic exposure to shifts in global risk sentiment. Episodes of heightened global uncertainty or monetary tightening in the AEs may trigger abrupt reversals in capital flows, amplifying volatility in domestic financial markets (Gelos et al., 2023). This phenomenon is consistent with the concept of "original sin redux",[5] which suggests that even EMEs issuing debt in their own currencies may remain vulnerable to shifts in global financial conditions (Eichengreen & Hausmann, 1999). Specifically, NR investors managing currency-mismatched portfolios may scale back EME exposures during risk-off episodes, exerting depreciation pressures on host country currencies (Carstens & Shin, 2019; Bertaut et al., 2023).

The share of NR investor holdings of LCY government bonds began tapering following the announcement in December 2016, reinforcing the non-internationalisation policy of the ringgit (Figure 4). This policy measure, aimed at safeguarding domestic financial stability, likely influenced foreign investor behaviour by limiting the ability to speculate on the ringgit through offshore markets. The decline in NR participation was further compounded by the tightening cycle of the US Federal Reserve and forward guidance by several major central banks during 2017 – 2018 (IMF, 2018), which contributed to the moderation in NR participation ahead of the COVID-19 pandemic in 2020.

Since then, NR holdings have remained relatively stable at a range of 20% to 25%, with resident investors continuing to anchor the domestic investor base. As of December 2024, NR investors held approximately 20% of the total outstanding LCY government bonds. The NR participation rate in Malaysia remains relatively high compared to the other EMEs, where it has averaged between 10% to 15% since 2020 (Figure 5).

5. The original sin refers to the inability of EMEs to borrow abroad in their own currencies, which exposes them to the fluctuations in global financial conditions (Eichengreen & Hausmann, 1999).

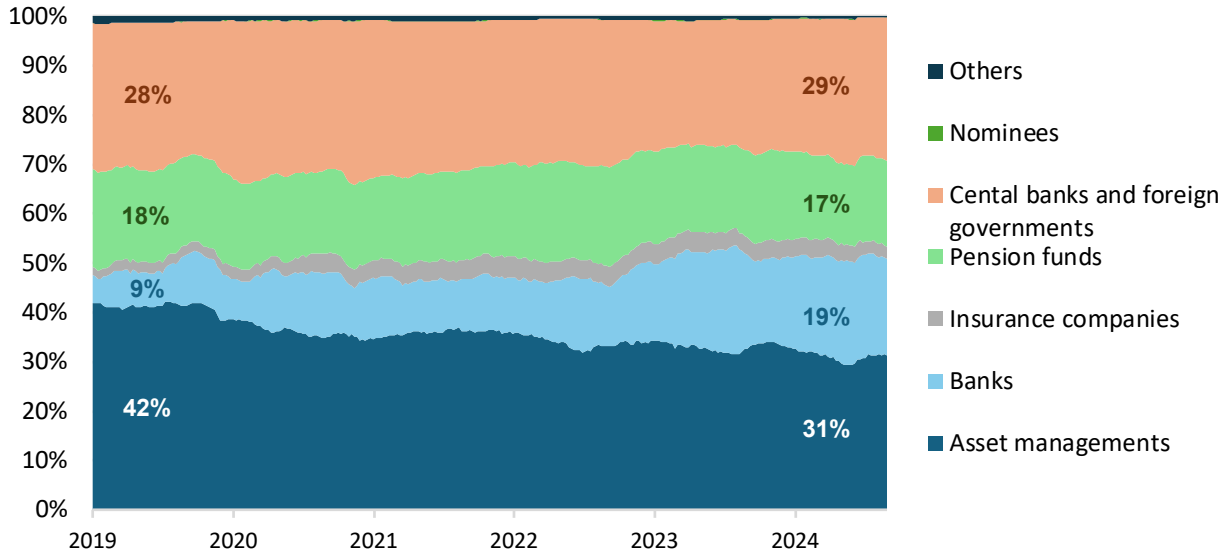
Figure 5: NR Participation in LCY Government Bond Market for Selected EMES, %



Note: Selected EME economies include; China, Indonesia, Japan, South Korea, Philippines, and Thailand. Quarterly data from 2003Q1 to 2024Q4.
Source: Bank Negara Malaysia, AsianBondsOnline.

More granular data since 2019 reveals a diverse mix of NR investors with varying investment profiles (Figure 6). As of December 2024, Asset Management firms, including mutual funds and hedge funds, constituted the largest group of NR investors in Malaysia at 31%. Central Banks and Foreign Governments were the close seconds, making up 29% of total NR investors. Over time, the presence of Pension Funds has remained relatively stable at 17%, while Foreign Banks' footprint in the LCY government bond market has steadily increased from 9% in 2019 to about 19% by end-2024.

Figure 6: Share of NR Holdings by Investor Types, %



Note: Others include mainly non-financial corporations.
Source: Bank Negara Malaysia.

This diverse investor profile, as documented by Bush et al. (2021) and Arslanalp et al. (2020), suggests potentially varied sensitivities to global factors, reflecting differences in investment horizons and asset allocation strategies across investor types. A detailed description of the top 5 largest types and their expected investment behaviour is provided in Table 1.

Table 1: Top 5 Largest NR Investor Types in the LCY Government Bond Market

No.	Investor Type and Share[6]	Definition	Investment Horizon	Expected Asset Allocation Strategy
1.	Asset Management (31%)	Institutional investors managing pooled funds on behalf of clients (e.g., mutual funds, ETFs, hedge funds)	Short- to Medium-term	• Opportunistic and responsive to market trends • Frequent portfolio rebalancing
2.	Central Banks and Foreign Governments (29%)	Sovereign institutions managing reserves or surplus government funds	Medium- to Long-term	• Conservative, stable investors • Higher focus on capital preservation
3.	Foreign Banks (19%)	Commercial and investment banks investing for liquidity management, proprietary trading, or balance sheet optimisation	Short- to Medium-term	• Mixed strategies; striking a balance between yield and liquidity • Some speculative activity possible • Moderately sensitive to changes in global factors
4.	Pension Funds (17%)	Institutions managing retirement assets to meet long-dated liabilities	Long-term	• Allocate heavily to long-duration bonds • Generally stable and less reactive
5.	Insurance Companies (4%)	Firms providing life, health, or general insurance, investing premium income to meet future liabilities	Long-term	• Prefer safe, predictable returns • Relatively less sensitive to temporary market fluctuations

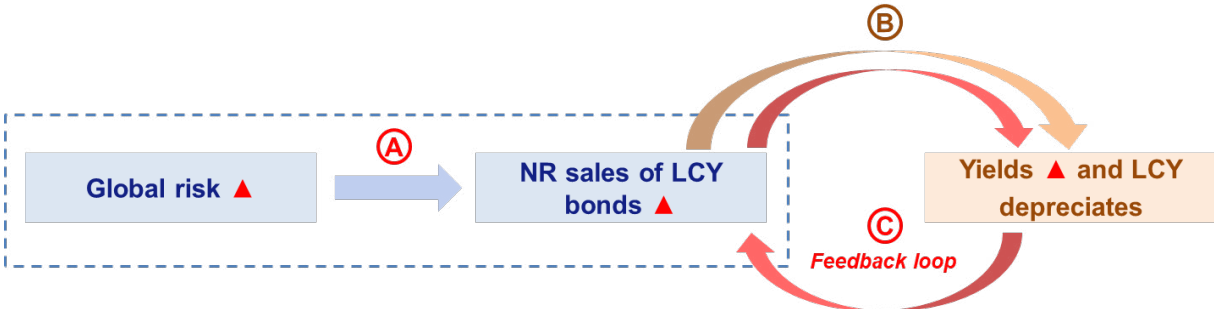
Source: Bank Negara Malaysia, Morozumi et al. (2023), Bertaut et al. (2023), Ng. et al. (2019), Timmer (2018).

6. As of December 2024.

2. Research Question

Given the relatively higher presence of NR investors in Malaysia's LCY government bond market – and the diversity in investor types – there is a case to examine the extent of external vulnerability and the channels through which global shocks are transmitted to the domestic government bond market. Figure 7 provides a conceptual framework based on prior assumptions, illustrating how a typical emerging market LCY government bond market might respond to such global shocks.

Figure 7: Schematic Representation of the Transmission of Global Shocks to the LCY Government Bond Market



Source: Morozumi et al. (2023).

In response to episodes of heightened global risk aversion – often triggered by periods of elevated global uncertainty – NR investors may be prompted to reduce exposure to LCY government bonds in a flight-to-safety move towards safer assets in other countries (A). The immediate impact of these divestments and the accompanying capital outflows may induce a rise in domestic bond yields and depreciation of the local currency (B), reflecting the direct transmission of global shocks to emerging economies' financial markets. As well documented in the literature (Carstens & Shin, 2019; Rey, 2015), this initial wave of selling by NR investors may trigger a feedback loop. Specifically, the local currency depreciation observed in (A) and (B) could further result in bond outflows by NR investors, leading to even greater local currency depreciation (C).

While this recursive mechanism is a critical component of broader capital flow dynamics, the scope of this chapter focuses solely on assessing the extent to which the initial investor reaction (A) is evidenced in the Malaysian LCY government bond market. The subsequent feedback effects (B and C) are reserved for future research.

This chapter seeks to address the following research questions:

- *How do NR investors in the Malaysian LCY government bond market react to external shocks?*
- *Are there heterogenous responses across different types of foreign investors?*

3. Data and Methodology

3.1 Data Construction

This chapter explores the role of NR investors in the transmission of global shocks, with a focus on their heterogenous behaviour across investor types. To this end, we examine a measure of weekly NR bond flows, defined as the weekly change in outstanding NR investors' LCY government bond holdings. Our analysis is restricted to public issuances with original maturities exceeding one year. Instruments under this category include MGS, GII, and SPK (refer to footnote 2 for more details).

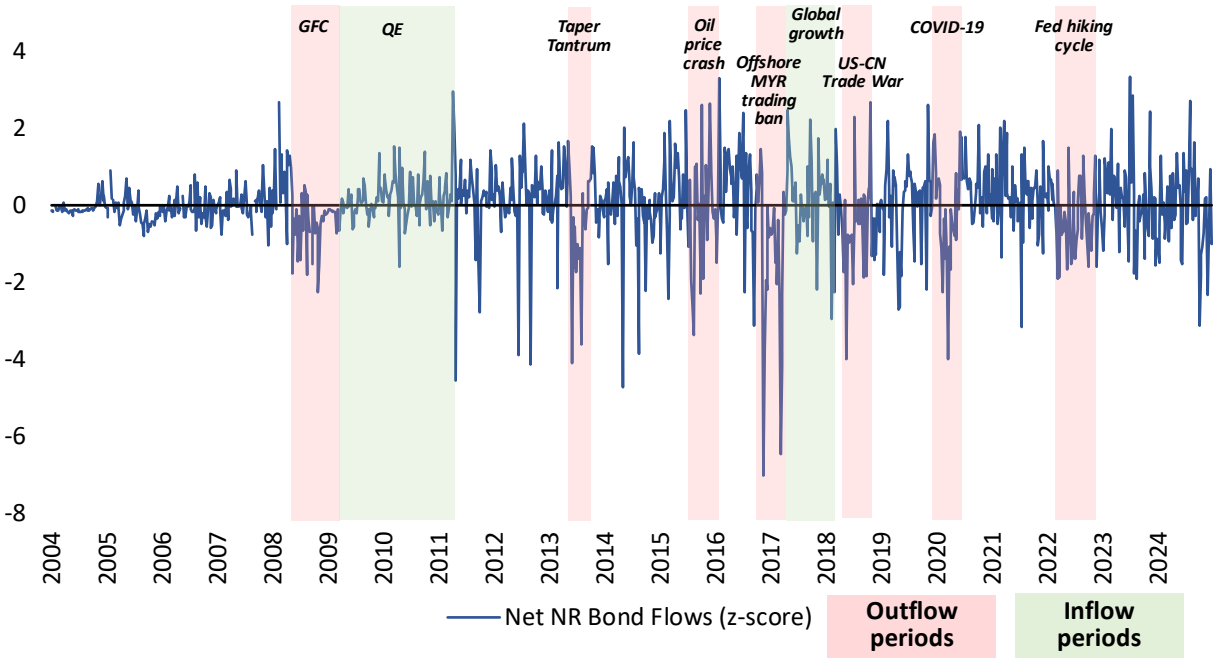
To construct the measure on NR bond flows, we extracted raw data on daily outstanding bond holdings. This dataset, available from the early 2000s up to December 2004, provides a classification by investor residency – resident vs non-resident – without further disaggregation by ultimate beneficial ownership or investor type. We refer to this dataset as the **NR overall**. A more granular dataset which identifies NR holdings by investor type, is only available from 2019 onwards. Using this subset, we constructed a second dataset referred to as the **NR by type**.

Next, we computed daily bond flows by taking the first difference of daily outstanding bond holdings (i.e., the change in holdings between time t and $t-1$). These daily flows are then aggregated to a weekly frequency to smooth out excess volatility and noise. Finally, the weekly flow series is standardised into its z-scores, as outlined in Equation (1), to allow for consistent interpretation of flow magnitudes across time and investor categories.

$$NR\ Bond\ Flows_{(i,z)} = \frac{\left(NR\ Bond\ Flow_{(i,t)} - \overline{NR\ Bond\ Flow_i}\right)}{s_i} \quad (1)$$

Where; i refers to the two datasets; **NR overall** and **NR by type**, $NR\ Bond\ Flow_{(i,t)}$ is the weekly net bond flows at time t for dataset i, $\overline{NR\ Bond\ Flow_i}$ is the mean of the weekly bond flows for dataset i, s_i is the standard deviation of the NR bond flows by each dataset. For the **NR by type** dataset, this standardisation procedure is applied separately to each investor type, though the corresponding investor-specific notations are suppressed in Equation (1) for brevity.

Figure 8: The Evolution of NR Overall Bond Flows' Z-Score Over Time



Notes: 1/ The z-scores can be interpreted as the number of standard deviations away from the mean, with large positive values indicating large inflows, and vice versa.
Source: Bank Negara Malaysia.

Several key observations emerge from Figure 8. Firstly, NR bond flows exhibit sharp reversals during episodes of adverse global financial conditions, consistent with heightened global risk aversion and flight-to-safety behaviour. For example, at the height of the GFC in 2008 - 2009, the z-score of weekly NR bold flows fell to around -2, a significant deviation relative to historical norms, signalling sizeable foreign selloffs. Similar withdrawal patterns were observed during other episodes of global stress, including the 2013 - 2014 Taper Tantrum, the onset of the COVID-19 pandemic in 2019-2020, and the US Federal Reserve's monetary tightening cycle beginning in 2022. Secondly, during periods of ample global liquidity – particularly following the implementation of QE by advanced economies post-GFC – NR bond flows turned persistently positive. Lastly, significant NR outflows were observed at end-2016 during the reinforcement of prohibitions on offshore trading of the ringgit, aimed at curbing speculative activity in the offshore non-deliverable forward (NDF) market. This episode highlights the sensitivity of foreign investor behaviour not only to global financial conditions but also to domestic policy measures.

3.2 Empirical Methodology

The analysis is structured in two key stages. First, drawing on the conceptual transmission framework illustrated in Figure 7, we examined the aggregate behaviour of weekly net NR bond flows **(NR overall)** in response to global shocks. Second, we explored the heterogeneity in these responses by disaggregating NR flows according to investor types **(NR by type)**. By comparing these behavioural patterns, we aim to uncover whether the composition of NR investor mediates the intensity of global shock transmission.

To empirically capture these dynamics, we employed a dynamic regression framework with an autoregressive distributed lag (ARDL) structure. In this framework, the dependent variable (weekly NR bond flows' z-score) is regressed on its own lags and lagged values of key explanatory variables:

$$Y_t = c_0 + c_t t + \sum_{i=1}^{p} \lambda_i Y_{t-i} + \sum_{i=1}^{q} \beta_i' \boldsymbol{X}_{t-i} + \varepsilon_0 \quad (2)$$

where Y_t denotes weekly net NR bond flows. The term t captures a linear time trend, while $\boldsymbol{X_{t-i}}$ is a matrix of lagged independent variables that proxy for global shocks, including the log of VIX index, the US Treasury (UST) 10-year yield, and a measure of expected ringgit's depreciation against the US dollar.[7] In the extension to this basic specification, we augmented the model with indicators of Malaysia's domestic macroeconomic fundamentals, including international reserves as a % of GDP and Malaysia's core inflation rate, to determine whether NR investors would react to shifts in macroeconomic fundamentals. For our analysis of NR bond flows by investor type, Equation (2) is further indexed by superscript j, to distinguish across different NR investor types. For brevity, we omitted these superscripts in the general exposition.

The ARDL model in Equation (2) is well-suited for our analysis, as it can accommodate a mix of stationary ($I(0)$) or non-stationary ($I(1)$) variables, provided a valid long-run cointegrating relationship exists among them. While a Vector Autoregressive (VAR) framework may be better suited for examining the full dynamic interactions and impulse responses to shocks, its high dimensionality is not ideal given the relatively short sample in our **NR by type** subset.

7. Proxied by the returns in offshore USDMYR non-deliverable forwards (NDF) price.

An additional advantage of the ARDL model lies in its ability to be re-parametrised into an unrestricted error-correction model (UECM), which separates the equilibrium (long-run) relationship from the short-run dynamics. The UECM representation is given as:

$$\Delta Y_t = c_0 + c_1 t - \alpha(Y_{t-1} - \boldsymbol{\theta}' \boldsymbol{X}_{t-1}) + \sum_{i=1}^{p-1} \psi_i \Delta Y_{t-i} + \sum_{j=1}^{k} \sum_{l=1}^{q-1} \boldsymbol{\omega}_{j,i} \Delta \boldsymbol{X}_{j,t-i} + \varepsilon_t \qquad (3)$$

Here, α is the speed-of-adjustment parameter, which captures how quickly NR bond flows revert to their long-run equilibrium in response to short-run deviations. The coefficients for the lagged differenced terms $(\psi_i, \boldsymbol{\omega}_{j,i})$ capture potentially complex short-run dynamics. In what follows, our primary interest lies in the equilibrium (long-run) coefficients, represented by $\boldsymbol{\theta}$, which quantify the sensitivity of NR bond flows to key global factors. Finally, one clarification on the interpretation of the coefficients $\boldsymbol{\theta}$ is in order: since NR outflows typically correspond to resident (R) inflows (except during bond redemption episodes), the estimated coefficients are best interpreted in relative rather than in absolute terms. For example, a positive and significant coefficient on global risk aversion implies that NR investors are more sensitive to such shocks compared to R investors, and it does not imply that the latter is unaffected by similar shocks.

To determine the appropriate order of the UECM estimation (p and q), the Akaike Information Criterion (AIC) is employed to capture the variables' essential dynamics without the risk of overfitting.

4. Results

We begin with presenting and discussing the results on long-run determinants of overall NR bond flows, focusing on the estimated equilibrium relationship. Following this, we examine how the determinants of NR bond flows differ across investor types, shedding light on potential heterogeneity in their responses to changes in global factors.

4.1 Overall Estimates

Table 2 presents the estimation results of the ARDL model, reparametrised into its UECM form. Lag lengths were selected based on the AIC. Column (1) which used the full sample period from 2004 to 2024, examined the long-run determinants of NR bond flows without distinguishing by investor types. For brevity, the table reports only the equilibrium (long-run) coefficients, while the short-run dynamics are omitted.

Table 2: Estimation Results for UECM Estimation of NR Bond Flows (Overall) to Changes in Global Factors (Full Sample = 2004 to 2024)

Period	**2004 - 2024**
Investor Type	**NR Investors (*Overall*)**
	(1)
Dependent variable: Weekly Net NR Bond Flows (z-score)	
VIX (log)	-0.02
UST 10y yield	-0.05*
Exp. MYR depreciation[1]	-2.14***
EC coefficient (α)	-0.72***
Observations	1009
Bounds_test_Fstat[2]	54.84
Bounds_test_pvalue	0.00**
BG-LM Test (p-value)[3]	0.89

*Notes: *** p < 0.01, ** p < 0.05, * p < 0.1. For brevity, constant and trend coefficients are not shown.*

(1) USDMYR expectations proxied by the weekly change in offshore USDMYR 1-month forward rate.

(2) Bounds testing approach of Pesaran et al. (2001) to test the existence of a long-run relationship. Null hypothesis: No level relationship.

(3) Breusch-Godfrey (BG) test for serial correlation in the disturbance up to the fourth lag order. Null hypothesis: No serial correlation.

Column (1) in Table 2 shows that in equilibrium, NR investors on an aggregate basis exhibit limited sensitivity to global risk sentiment, as proxied by the VIX index. While the coefficient on VIX carried the expected negative sign, it was statistically insignificant at the 5% level, suggesting that global risk aversion, in isolation, may not be a dominant driver of aggregate NR bond flows. In contrast, the coefficient on the 10-year UST yield was significant, although only at the 10% level, indicating some sensitivity to shifts in global interest rates. Notably, expectations of ringgit depreciation play a more prominent role, with the corresponding long-run coefficient being statistically significant at the 1% level. This highlights the importance of exchange rate considerations in shaping NR investor behaviour over the long-run.

These findings motivate our hypothesis that aggregate-level results may obscure underlying heterogeneity across investor types. For instance, Asset Managers – typically guided by more flexible investment mandates and active portfolio strategies – are likely to respond more sharply to changes in global risk sentiment. Pension Funds, in contrast, may react less aggressively due to their longer-term investment horizons and liability-matching approaches. Hence, while the aggregate response to global risk factors may appear muted, this likely reflects the compositional averaging of distinct behavioural patterns across investor classes. This hypothesis is explored further in the next section, which disaggregated NR bond flows by investor type to uncover these differentiated responses.

4.2 Estimates by Investor Types

We utilise weekly data for the determinants of NR bond flows by investor type. Due to constraints in data availability, this segment of the analysis covered the period from 2019 to 2024. Table 2 presents the estimation results from the ARDL model, re-parametrised into an UECM form. The model is estimated separately for each investor type.

Table 3: Estimation Results for UECM Estimation of NR Bond Flows by Investor Type to Changes in Global Factors (Sub-Sample = 2019 to 2024)[8]

Period	2019 - 2024						
Investor Type	Asset Managers	Banks	Pension Funds	Central Banks and Govt.	Insurance	Nominee and Individual	Others[1]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable: Weekly Net NR Bond Flows (z-score)							
Long run[9]							
VIX (log)	-0.34**	-0.26	-0.35	-0.31	-0.35	-0.02	-0.39**
UST 10y yield	-0.09**	-0.06	-0.09	-0.09**	-0.09	-0.00	-0.11**
Exp. MYR depreciation[2]	-1.82**	-2.38***	-1.97***	-1.88**	-2.35**	-0.05	-1.83***
EC coefficient (α)	-0.73***	-0.77***	-0.76***	-0.72***	-0.80***	-0.69***	-0.76***
Observations	290	276	289	276	289	294	290
Bounds_test_ Fstat	16.21	9.28	16.17	7.90	18.17	19.38	16.21
Bounds_test_ pvalue	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***
BG-LM Test (*p-value*)[3]	0.525	0.447	0.417	0.476	0.226	0.00	0.503

*Notes: *** p < 0.01, ** p < 0.05.*

(1) "Other flows" consist of those related to non-financial corporations, and entity types that are not reported in INSIDES.

(2) Proxied by the lead USDMYR returns at time t. The team is exploring the possibility of using USDMYR 1-month forward as a closer proxy for USDMYR expectations. This shall be included in the refined results of the study.

(3) Breusch-Godfrey (BG) test for serial correlation in the disturbance up to the fourth lag order. Null hypothesis: No serial correlation.

8. Tables 2 and 3 reported diagnostic tests to assess model adequacy. The presence of a long-run relationship, based on the framework in Figure 7, was tested using the Bounds Testing approach (Pesaran et al., 2001), with F- and t-statistics evaluated against Kripfganz and Scheider (2020). Results confirmed cointegration in all specifications. The Breusch-Godfrey LM test also found no evidence of serial correlation (lags 1-4).

9. It is important to note that our analysis does not establish causal relationships in the strict econometric sense; rather it identifies the long-run associations between the NR bond flows by investor type and macroeconomic variables of interest that may be interpreted as Granger-causal in nature, given the lag structure of the ARDL framework

Column (1) in Table 3 indicates that, in equilibrium, Asset Managers are notably more sensitive to changes in global factors than other investor types – particularly to shifts in global risk sentiment and fluctuations in global interest rates. This is evidenced by the statistically significant and negative coefficient on the log of the VIX index. Specifically, the estimated long-run coefficient of -0.34 implies that, in equilibrium, a 1 percentage point increase in the VIX index is associated with a 0.34-point decline in the z-score of Asset Managers' net bond flows. This implies net outflows in response to rising global risk aversion. The VIX index, often regarded as a barometer of market uncertainty and global stress, proxies investor sentiment in US equity markets but is widely used in the literature as a global risk sentiment indicator. The strong sensitivity of Asset Managers to VIX shocks is consistent with their profile as tactical investors – including mutual funds and hedge funds – which tend to rebalance portfolios away from emerging market assets during risk-off episodes.

These findings align with insights from internal desk surveillance and ongoing engagements with financial market participants. Specifically, investor categories generally categorised by shorter investment horizons and higher liquidity needs – often referred to as "hot money" flows – exhibit greater long-run sensitivity to transitory fluctuations in global factors. Asset Management firms, for instance, often manage client funds that may be subject to sudden redemption requests during periods of global market stress, prompting more flexible and responsive asset allocation strategies.

In contrast, other institutional investors such as Pension Funds typically display more stable behaviour. Pension Funds typically operate under longer-term investment mandates shaped by liability-matching objectives, resulting in strategic asset allocation frameworks that are less sensitive to short-term fluctuations in global financial markets. As a result, during periods of heightened uncertainty, these investors are more likely to maintain their bond holdings rather than engage in procyclical selloffs. Similarly, Insurance Companies, particularly life insurers, face structural constraints that limit their responsiveness to temporary global market volatility. Their portfolios are designed to match long-duration liabilities – such as life insurance and annuity contracts – resulting in investment strategies that are relatively insulated from short-term market noise.

Turning to other investor categories – namely Foreign Banks, Pension Funds, Central Banks and Foreign Governments, and Insurance Companies (Columns (2) through (5)) – the analysis reveals further distinctions. While these groups generally exhibit limited sensitivity to the VIX index, most display statistically significant sensitivity to expected ringgit depreciation. A notable exception is Central Banks and Foreign Governments (Column (4)), which show a statistically significant response to changes in the 10-year US interest rate, mirroring the behaviour observed among Asset Managers. This may reflect their active reserve management strategies or broader macro-financial considerations.

Across all investor types, the EC terms are negative and statistically significant, confirming the presence of a valid long-run cointegrating relationship. The broadly similar magnitudes of these coefficients suggest that the speed of adjustment toward equilibrium is relatively consistent across investor types, reinforcing the robustness of the long-run dynamics captured in the model. For Asset Managements, the EC coefficient of -0.71 points to a relatively fast correction mechanism, which in the literature is often interpreted as evidence of efficient information processing and market responsiveness.[10]

Lastly, it is worth noting that expectations of ringgit depreciation are a statistically significant determinant of NR bond flows across all major investor types. This likely reflects the unhedged nature of most NR investments in the Malaysian LCY bond market, which make exchange rate risk a critical factor in bond allocation decisions. Due to the negligible share of nominee accounts, individuals, and other residual investor categories – accounting for less than 0.01% of total NR holdings during the sample period – these groups were excluded for further analysis.

5. Policy Implications

Our empirical findings underscore that Asset Managers remain a dominant driver of procyclical capital flows – commonly referred to as "hot money" – in Malaysia's LCY government bond market. Their behaviour, charaterised by shorter investment horizons and heightened sensitivity to global risk sentiment, contributes to episodic volatility, especially during periods of external financial stress. These flows pose potential vulnerabilities through rapid reversals, amplifying market fluctuations and potentially destabilising domestic financial conditions.

Nonetheless, it is noteworthy that the proportion of asset managers holdings has gradually declined since 2019, partly reflecting broader shifts in global asset allocation. This evolution has tempered Malaysia's direct exposure to volatile capital flows and has, to some extent, mitigated risks related to the original sin redux. At the same time, efforts by Bank Negara Malaysia, together with the Securities Commission Malaysia and Bursa Malaysia – through capital market development initiatives, regulatory facilitation and targeted engagements with strategic investors – have contributed to a more balanced and diversified market structure. The growing presence of long-term institutional investors such as Pension Funds and Insurance Companies has helped anchor the market, enhance shock absorption capacity and market resilience.

10. Beirne et al. (2014) find convergence coefficients ranging from -0.25 to -0.60 for capital flows in emerging market bond markets, with larger coefficients for more liquid and information-sensitive segments. Similarly, Sula and Willett (2009) report EC terms between -0.30 and -0.65 in their analysis of capital flow sensitivity to global risk factors, highlighting faster adjustment for more open and financially integrated economies.

Still, these improvements do not eliminate the need for active and continued surveillance of tactical investor flows. Given their potential to exhibit herding behaviour or sudden retrenchment in response to external shocks (e.g., Fed rate hikes, geopolitical risks), early detection mechanisms are critical to pre-empt market stress and systemic spillovers.

Importantly, our analysis also highlights that NR investors across all categories exhibit rather strong sensitivity to ringgit depreciation expectations, pointing to exchange rate risk as a central factor in portfolio allocation decisions. As such, exchange rate management and investor communication play a crucial role in anchoring expectations and maintaining market confidence.

Against this backdrop, several policy imperatives emerge:

1) **Enhancing market resilience through investor base diversification:** Broader efforts are needed to attract participation from long-term, stable investors, such as pension funds and insurance companies, which are less likely to react to short-term volatility. A larger and more active domestic institutional investor base can also serve as a countercyclical stabiliser, enhancing price discovery and absorbing external shocks more effectively. In this regard, Malaysia has made proactive and continuous efforts over the years to engage a diverse range of investors, with the aim of strengthening their understanding of market dynamics and the broader economic outlook, thereby mitigating undue market reactions, particularly during periods of financial stress.

2) **Improving market accessibility and operational clarity for NR investors:** Enhancing market microstructure and providing a clear operational framework for non-resident participation can support a balanced and sustainable NR involvement in the domestic bond market.

3) **Strengthening FX risk management:** Given the sensitivity of NR flows to exchange rate fluctuations, there is a compelling case to promote access to liquid, affordable FX hedging instruments. Doing so would allow investors to better manage risks while supporting more stable capital inflows over time. The Dynamic Hedging programme introduced in December 2016 forms part of Malaysia's initiative to facilitate risk management capabilities and market access for NR investors.

In conclusion, striking the right balance between capital market openness and financial system resilience remains a persistent challenge for emerging markets. A resilient bond market underpinned by a diversified investor base, credible policy communication, complemented by effective surveillance on capital flows, will be essential in safeguarding external stability while ensuring sustained access to international capital on favourable terms.

References

Arslanalp, S., D. Drakopoulos, R. Goel, & R. Koepke. (2020). Benchmark-driven investments in emerging market bond markets: Taking stock. IMF Working Paper 20/192.

Beirne, J., Renzhi, N., & Volz, U. (2014). Portfolio flows, volatility and growth in emerging Asia. Asian Development Bank Institute (ADBI) Working Paper. No. 451.

Bertaut, C., Bruno, V., & Shin, H. (2023). Original sin redux: Role of duration risk. BIS Working Papers. No. 1109.

A. Morozumi, Bleaney, M., & A. Sulistiono. (2023). Types of foreign investor and local-currency bond markets in emerging economies. Available at SSRN: https://ssrn.com/abstract=4586788 or http://dx.doi.org/10.2139/ssrn.4586788

Bush, G., C. Canon, and D. Gray. (2021). Emerging market capital flows: The role of fund manager portfolio allocation. Working Paper. No. 2021-13, Banco de Mexico.

Broner, F., Didier, T., Erce, A., & Schmukler, S. L. (2013). Gross capital flows: Dynamics and crises. *Journal of Monetary Economics*, 60(1), 113–133.

Carstens, A., & Shin, H. S. (2019). Emerging markets aren't out of the woods yet. Project Syndicate / BIS Speeches.

Eichengreen, B., & Hausmann, R. (1999). Exchange rates and financial fragility. NBER Working Paper, 7418.

Gelos, G., Gornicka, L., Koepke, R., Sahay, R., & Sgherri, S. (2023). Capital flows at risk: Taming the ebbs and flows. IMF Working Paper 19/279.

International Monetary Fund. (2014). Global financial stability report: Risk taking, liquidity, and shadow banking. Global Financial Stability Report, October 2014. Available at: https://www.imf.org.

International Monetary Fund. (2018). Malaysia: Financial sector assessment program—Technical note on systemic liquidity. IMF Country Report No. 18/62. Available at: https://www.imf.org.

Ng, D., I. Shim, & J. M. V. Pastor (2019). The role of different institutional investors in Asia-Pacific bond markets during the taper tantrum, in Asia-Pacific fixed income markets: evolving structure, participation and pricing, BIS Papers, ed. By Bank for International Settlements, Vol. 102, 113-142.

Rey, H. (2015). Dilemma not trilemma: The global financial cycle and monetary policy independence. NBER Working Paper No. 21162.

Sahay, R., Čihák, M., N'Diaye, P., Barajas, A., Mitra, S., Kyobe, A., Mooi, Y. N., & Yousefi, S. R. (2015). Rethinking financial deepening: Stability and growth in emerging markets. IMF Staff Discussion Note SDN/15/08. International Monetary Fund. Available at: https://www.imf.org

Sula, O., & Willett, T. D. (2009). The reversibility of different types of capital flows to emerging markets. *Emerging Markets Review*, 10(4), 296–310.

Timmer, Y. (2018). Cyclical investment behavior across financial institutions. *Journal of Financial Economics,* 129, 269-286.

World Bank. (2020). How Malaysia achieved a thriving domestic bond market. Available at: http://documents.worldbank.org

Chapter 4

THAILAND AND FACTORS AFFECTING NON-RESIDENT CAPITAL FLOWS IN THAI LOCAL CURRENCY GOVERNMENT BONDS MARKET

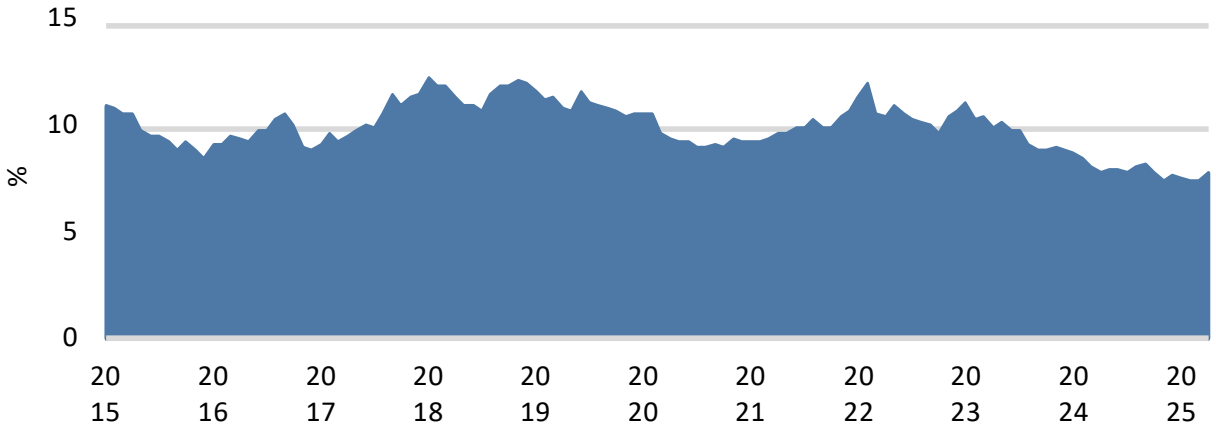
By

Chanaichon Vasustien and **Sithipath Yooprong**[1]

1. Background

In the Thailand local currency government bond market, NR investors have been one of the dominant players, owning approximately 8% of total outstanding Thai government bonds (Figure 1).[2]

Figure 1: NR Bond Holding of Thailand Government Bond as Percent of Total Government Bond Outstanding

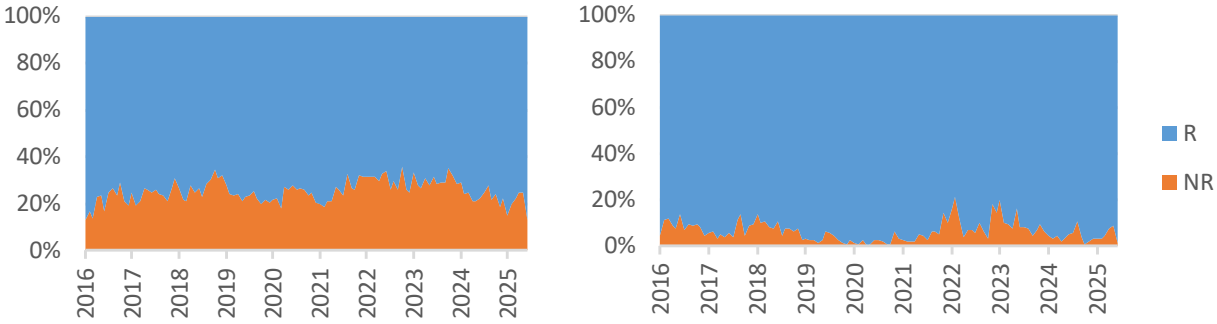


Source: ThaiBMA.

Although their proportion of holding has decreased since Covid 19, their activity in the secondary market is still significant, especially in long-term (> 1 year) bonds, making up on average, 25% of total trade volume each month. In contrast, their activity in short-term (< 1 year) bonds remains muted (Figure 2).

1. Authors are from Bank of Thailand.
2. Government bonds refer to bonds that are issued either by the Thai Ministry of Finance or the Bank of Thailand.

Figure 2 : NR Trading Volume as Percent of Monthly Trading Volume for Long-term Bond (Left) and Short-term Bond (Right)



Source: ThaiBMA.

Some studies have argued that NR investors can improve market liquidity as they provide two-way flow unlike traditional buy-and-hold investors. Additionally, their existence is found to lower government borrowing costs (Peiris, 2010) and consequently, corporate borrowing costs as there is a pass-through effect from government bond yield to corporate bond yield (Dittmar and Yuan, 2008).

However, NR existence in bond markets is a double-edged sword. Unal (2018) found that NR participation leads to higher bond yield volatility. One possible explanation is that NR investors are now exposed to the FX rate risks in local currency bonds, unlike the original sin concept as proposed by Eichengreen and Hausmann (1999). Consistent with this, the Hong Kong Monetary Authority (2020) found that there is a spillover from exchange rate volatility to local currency bond fund flow volatility. Other negative effects include correlated bond flows from countries as NR investors view countries in the same benchmark as a singular asset (Arslanalp and Tsuda, 2015). As a result of this, it is important to determine which factors, both global and domestic, are the push and pull factors for NR holdings in Thailand.

2. Literature Review

Arslanap et al. (2020) utilised a linear model by regressing emerging market bond flows against risk, rate and domestic factors. The risk, rate and domestic factors were proxied by US corporate bond yield over US treasury yield, US 10-year treasury yield, and Citigroup's economic surprise index respectively. Their results suggested that bond flows in emerging market countries are more susceptible to global factors rather than domestic factors.

In the same manner, Erduman and Kaya (2016) found interest rate differential to be the most important pull factors for emerging market economy. Their reasoning is that the high-yielding nature of emerging market bonds can attract portfolio inflow in times of worsening global economic fundamentals and high uncertainty. However, they note that the growth rate is not a significant pull factor.

Morozumi (2024) suggested that four factors primarily drive NR bond outflows:

1. An increase in global risk aversion, as NR investors would relocate their flow away from emerging market bonds back to safe-haven assets.
2. An increase in external (US) interest rates, as high US interest rates would attract NR investors to invest in the US instead of emerging market countries, given that the US has less sovereign risk.
3. An increase in the expected depreciation rate of the domestic currency as depreciation of the local currency will lead to loss in total return and so if the NR investors expect the currency to depreciate further, they are likely to sell the bond.
4. Worsening domestic macroeconomic fundamentals as deteriorating economic fundamentals imply that the government's tax receipt would decrease, resulting in higher sovereign risk and a higher yield from risk premium. NR investors would then try to protect their loss by selling the bond.

3. Data & Methodology

Following the proposal from Morozumi (2024), an ARDL model is used to quantify the effects of the push and pull factors. Each factor is proxied by different variables: VIX (vix) for global risk aversion; US Treasury 10-year yield (i^{US}) for external interest rates; difference in 1 month forward rate and current spot rate (D^e) for expected depreciation rate; and SET (Stock Exchange of Thailand) index (SET) for domestic fundamental.

The data for NR's bond flow is obtained from ThaiBMA. The VIX, US 10-year treasury yield, USD/THB forward and spot exchange rates are end-of-day values (17:00 GMT+7) sourced from Bloomberg, while the SET Index is the official closing price provided by the Stock Exchange of Thailand (SET). Lastly, the weight of Thailand in JPMorgan GBI-EM index is obtained from the monthly publishment on JPMorgan website.

The estimation of the factor effects is done via the ARDL model using the following equation:

$$Y_t = c_0 + c_1 t + \sum_{i=1}^{p} \psi^i Y_{t-i} + \sum_{j=1}^{q} \sum_{k=1}^{r} \beta_{j,k} X_{j,t-k} + \varepsilon_t$$

which is then transformed to the unrestricted error correction form as:

$$\Delta Y_t = c_0 + c_1 t - \alpha(Y_{t-1} - \theta X_{t-1}) + SR\_dynamics + \varepsilon_t$$

where

- Y_t is NR investors' net buy/sell of bonds with longer than 1 year maturity from time period $t-1$ to t
- X_{t-1} include the four factors as mentioned above: vix_{t-1}, i^{us}_{t-1}, D^e_{t-1}, SET_{t-1}
- α is the speed of adjustment

The regression is done on weekly and monthly frequency from 2012 to 2024 to include periods of high volatility, such as the taper tantrum (2013) and Covid-19 (2020). However, for the monthly model, to account for the effect of benchmark investors, the change in weight of Thailand in JPMorgan GBI-EM index ($GBIEM$) is also included as an exogeneous factor in the equation resulting in:

$$\Delta Y_t = c_0 + c_1 t - \alpha(Y_{t-1} - \theta X_{t-1}) + SR\_dynamics + c_2 \Delta GBIEM_t + \varepsilon_t$$

where $\Delta GBIEM_t = GBIEM_t - GBIEM_{t-1}$

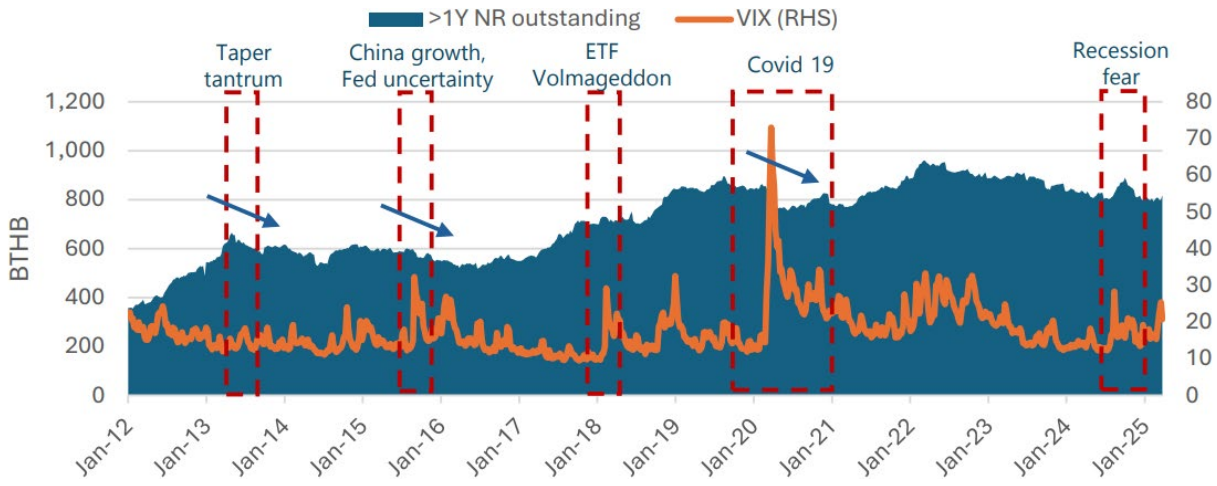
Overall, it is expected that the long-run coefficients will be negative for the push factors (vix_{t-1}, i^{us}_{t-1}, D^{e}_{t-1}) and positive for the pull factors (SET_{t-1}).

3.1 Stylised Facts for Each Factor

VIX Index

Periods of elevated global uncertainty often coincide with significant outflows from Thai government bonds, as NR investors reduce risk exposure (Figure 3). Events like the Taper Tantrum, China slowdown, especially COVID-19 saw sharp rises in the VIX index and corresponding NR bond outflows. However, this was not the case during the ETF Volmageddon in 2018, where despite a VIX spike, no major outflow occurred. This is likely because the spike stemmed from technical market disruptions, not economic fundamentals.

Figure 3 : The VIX Index and NR Bond Outstanding in Thailand

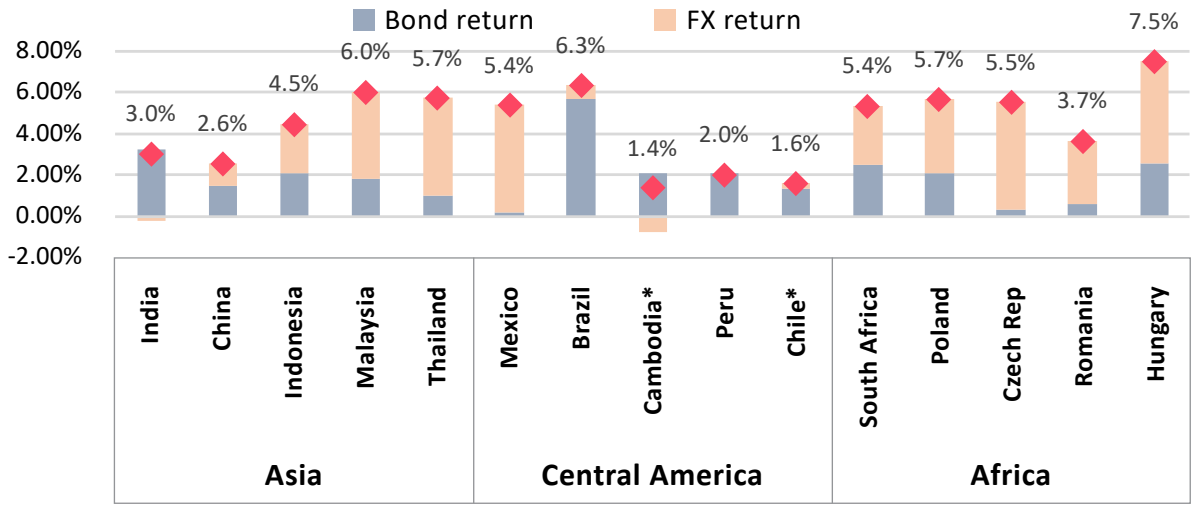


Source: Bloomberg, ThaiBMA.

3.2 Yield and Foreign Exchange Rate

Thailand government bonds are typically classified as low-yield bonds compared to regional peers, resulting in consistent underweighting of Thai government bonds by NR investors in global fixed income benchmarks (Suwanapruti, 2013). Nevertheless, several factors may still attract NR investment. First, Thailand's relatively steep yield curve offers the potential for positive carry and roll-down returns, enhancing the appeal of longer-duration bonds. Second, expectations of further interest rate cuts driven by a slowing economic momentum can lead to capital gains. Third, FX gains can significantly boost total returns, particularly during periods of U.S. dollar weakness, for example, during the period of April to May 2025 (Figure 4). Conversely, during periods of U.S. dollar appreciation, FX losses reduce overall returns and negatively impact bond flows.

Figure 4: Total Return from 10-Year Government Bond in Emerging Market Countries from April 2025 – May 2025

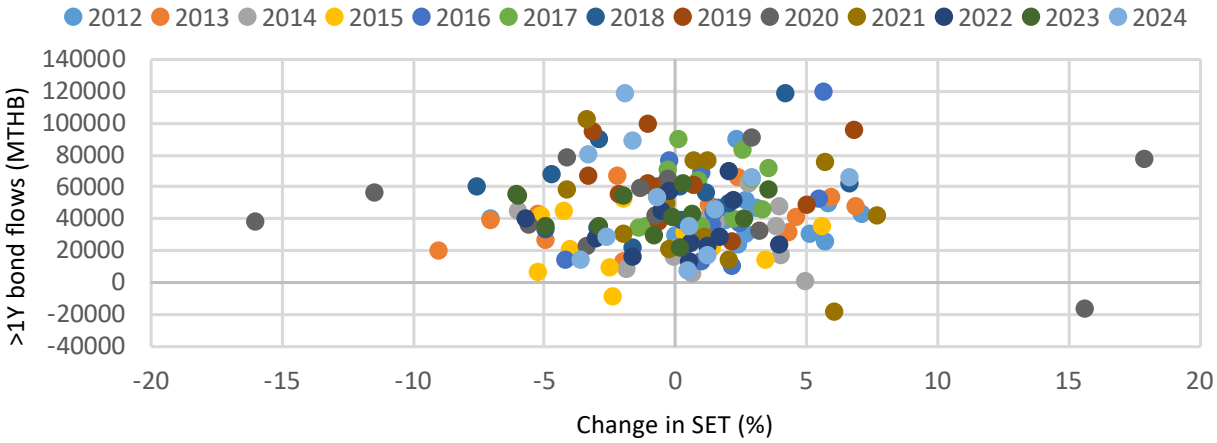


Source: Bloomberg, Authors' calculation.

3.3 Macroeconomic Fundamentals

The impact of economic fundamentals on Thai government bond flows can be twofold (Figure 5). A weak economic outlook may attract NR investor inflows if it raises expectations of further rate cut by the central bank, thereby enhancing the potential for capital gains. On the other hand, it may elevate perceptions of sovereign credit risk, prompting a rise in bond yields as investors demand higher compensation. This repricing can lead investors to reduce their holdings to mitigate valuation losses.

Figure 5: >1Y Monthly NR Bond Flow Against Change in the SET Index in Various Years

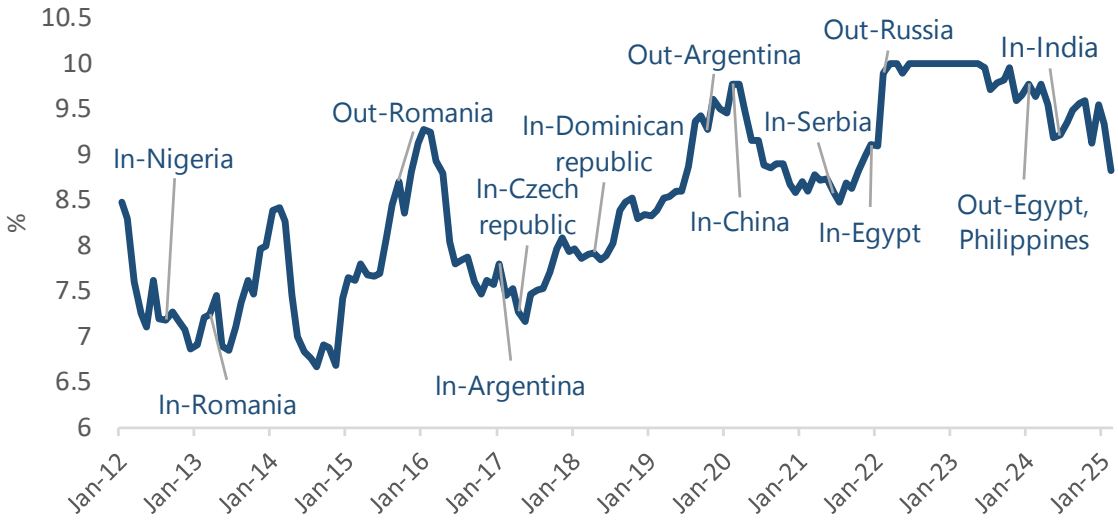


Source: Bloomberg, ThaiBMA, Authors' calculation.

3.4 Weight of Thailand in JPMorgan GBI-EM Index

With AUM of $233 bn as of July 2024, the JPMorgan GBI-EM index is one of most popular benchmarks for emerging market local currency government bonds. Over time, Thailand's weight has fluctuated from a country's inclusion and exclusion (Figure 6). When countries with a large bond market capitalisation, such as China, are added to the index, Thailand's share may decrease. However, this is not guaranteed. For instance, during India's inclusion in 2024, Thailand's weight remained relatively stable because Brazil's investable bond market capitalisation shrank. As Thailand's weight changes, benchmark investors must re-allocate their holdings to accurately track the index.

Figure 6: Weight of Thailand in JPMorgan GBI-EM Index, In indicates Inclusion, Out indicates Exclusion



Source: JPMorgan.

4. Results

The long-run coefficient results from using ARDL model on the monthly and weekly frequency are reported in Table 1.

Table 1: ARDL Regression Result on Monthly Daya (Left) and Weekly Data (Right) from Eviews

ARDL Long Run Form and Bounds Test
Dependent Variable: D(FLOWMT1Y)
Selected Model: ARDL(2, 3, 0, 0, 0)
Case 5: Unrestricted Constant and Unrestricted Trend
Date: 06/03/25 Time: 23:14
Sample: 2012M01 2024M12
Included observations: 156

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	96758.00	28134.03	3.439180	0.0008
@TREND	78.14846	66.82395	1.169468	0.2441
FLOWMT1Y(-1)*	-0.840701	0.098264	-8.555515	0.0000
VIX(-1)	-1678.822	495.2096	-3.390123	0.0009
UST10Y**	-9368.646	2785.307	-3.363596	0.0010
_1MAPPUSDTHBPFR...	-49229.30	15603.10	-3.155098	0.0020
SET**	-7.763280	13.88797	-0.558993	0.5770
D(FLOWMT1Y(-1))	0.154049	0.081443	1.891489	0.0606
D(VIX)	-722.4400	470.0236	-1.537029	0.1265
D(VIX(-1))	-328.8114	465.5837	-0.706235	0.4812
D(VIX(-2))	720.8278	442.2809	1.629796	0.1053
D_GBIEM_THW	181533.3	802882.5	0.226102	0.8214

* p-value incompatible with t-Bounds distribution.
** Variable interpreted as Z = Z(-1) + D(Z).

Levels Equation
Case 5: Unrestricted Constant and Unrestricted Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
VIX	-1996.930	563.3693	-3.544619	0.0005
UST10Y	-11143.84	3149.361	-3.538446	0.0005
_1MAPPUSDTHBPFR...	-58557.41	19078.57	-3.069277	0.0026
SET	-9.234288	16.64799	-0.554679	0.5800

ARDL Long Run Form and Bounds Test
Dependent Variable: D(FLOWMT1Y)
Selected Model: ARDL(4, 0, 0, 0, 1)
Case 5: Unrestricted Constant and Unrestricted Trend
Date: 06/03/25 Time: 23:08
Sample: 1/01/2012 12/29/2024
Included observations: 679

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	19182.58	5558.107	3.451279	0.0006
@TREND	2.465477	3.366209	0.732419	0.4642
FLOWMT1Y(-1)*	-0.800759	0.070104	-11.42243	0.0000
VIX**	-320.4692	78.86060	-4.063743	0.0001
UST10Y**	-2086.995	578.3909	-3.608278	0.0003
_1MAPPUSDTHBPFR...	-11745.67	3507.758	-3.348485	0.0009
SET(-1)	-0.459723	3.017471	-0.152354	0.8790
D(FLOWMT1Y(-1))	-0.122071	0.061783	-1.975782	0.0486
D(FLOWMT1Y(-2))	-0.146199	0.051162	-2.857551	0.0044
D(FLOWMT1Y(-3))	-0.104271	0.038246	-2.726328	0.0066
D(SET)	-34.86759	15.13174	-2.304268	0.0215

* p-value incompatible with t-Bounds distribution.
** Variable interpreted as Z = Z(-1) + D(Z).

Levels Equation
Case 5: Unrestricted Constant and Unrestricted Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
VIX	-400.2070	100.2429	-3.992372	0.0001
UST10Y	-2606.272	711.7551	-3.661753	0.0003
_1MAPPUSDTHBPFR...	-14668.18	4354.826	-3.368258	0.0008
SET	-0.574109	3.772998	-0.152163	0.8791

Of note, NR's long-term bond flow has a very high speed of adjustment at approximately 0.8. This suggests that NR's long-term bond flow can normalise quickly in a period of shock. Aside from that, global uncertainty, high external rate, and expected local currency depreciation are found to be statistically significant push factors with the conformed sign on both monthly and weekly frequency in the long-run (levels equation in Table 1). The change in the JPMorgan GBI-EM index, while having the correct sign, is not statistically significant. The domestic pull factor is also not found to be statistically significant. The interpretation is as follows:

- A high global uncertainty, as proxied by the VIX index, leads to NR investors shifting their flow back to comparatively safer assets to protect their loss.
- A high external interest rate, as proxied by the yield on 10-year US treasury, triggers bond outflow from Thailand as NR investors diverge their investment to seek higher yields abroad.

- Local currency depreciation can lead to sizable losses, especially considering that the currency market is often volatile compared to the bond market. Hence, in a period of continuing Thai Baht depreciation, unhedged NR investors may sell or underweight Thai bond.
- The weight of Thailand in the JPMorgan GBI-EM index not being statistically significant could be due to NR investors' portfolio reallocation behaviour. While the rebalance is supposed to occur at the end of month, actual behaviours may happen across the month from market frictions. Additionally, the weight of Thailand, while seemingly volatile, gradually adjusts over time.
- The domestic fundamentals do not seem to affect NR flow. This is consistent with findings from Arslanap et al. (2020)

For robustness check, the variables in the equation are substituted by other variables that represent the same factors. For example, the US corporate BBB spread, and the Move index were used to represent global risk aversion. For domestic factors on monthly frequency, Thailand CEI (coincident economic indicator) and LEI (leading economic indicator), published by Bank of Thailand, were also utilised.

5. Conclusion

This study reveals that the factors that drive NR bond flow in Thailand are mainly global push factors, in particular, external internal interest rate, risk aversion, and expected depreciation rate of local currency. The weight of Thailand in the JPMorgan GBI-EM index and macroeconomic fundamental are found to be negligible.

Empirical observations generally support these conclusions, except in specific situations—such as shifts in market expectations regarding aggressive central bank rate cuts or the inclusions of certain countries in the JPMorgan GBI-EM index that cause Thailand's weight to decrease significantly.

As a result, in countries where there is a high proportion of NR investors in the bond market, it is imperative for policymakers to monitor these factors and prepare appropriate policy responses to tackle the shock to these factors. One possible method is to monitor the response among different types of NR investors to different factors.

For further study, examining the response from different categories of NR investors to the global and domestic factors can yield further insights into their behaviours. Additionally, comparative studies across countries with different levels of NR participation in bond markets could shed light on effective approaches to enhance market resilience.

References

Arslanalp, S., Drakopoulos, D., Goel, R. and Koepke, R. (2020). Benchmark-driven investments in emerging market bond markets: Taking stock. International Monetary Fund.

Arslanalp, S. and Tsuda, T. (2015). Emerging market portfolio flows: The role of benchmark-driven investors. *IMF Working Papers*, 15(263), p.1. doi:https://doi.org/10.5089/9781513570655.001.

Dittmar, R.F. and Yuan, K. (2008). Do sovereign bonds benefit corporate bonds in emerging markets? *Review of Financial Studies*, 21(5), pp.1983–2014. doi:https://doi.org/10.1093/rfs/hhn015.

Eichengreen, B. and Hausmann, R. (1999). Exchange rates and financial fragility. [online] www.nber.org. Available at: https://www.nber.org/papers/w7418.

Erduman, Y. and Kaya, N. (2016). Time varying determinants of bond flows to emerging markets. *Central Bank Review*, 16(2), pp.65–72. doi:https://doi.org/10.1016/j.cbrev.2016.05.003.

Hong Kong Monetary Authority (2020). Foreign participation in the local currency bond markets of emerging market economies: good or bad for market resilience and financial stability? *BIS Papers chapters*, [online] 113, pp.133–140. Available at: https://ideas.repec.org/h/bis/bisbpc/113-08.html [Accessed 1 Jul. 2025].

Morozumi, A. (2024). Foreign investor trading and spillovers to local-currency bond markets in SEACEN economies.

Peiris, Mr.Shanaka. J. (2010). Foreign participation in emerging markets' local currency bond markets. International Monetary Fund.

Suwanapruti, D. (2013). Looking behind foreign inflows to the Thai bond market. [online] Nation Thailand. Available at: https://www.nationthailand.com/business/30201238 [Accessed 30 Jun. 2025].

Unal, N. (2018). Impact of foreign investor participation on emerging market local currency government bond yields. [online] DG. Available at: https://repository.digital.georgetown.edu/handle/10822/1050870 [Accessed 26 Jun. 2025].

Chapter 5

SOUTH KOREA AND STABILITY IN THE LOCAL-CURRENCY GOVERNMENT BOND MARKET AMID GLOBAL SHOCK TRANSMISSION

By

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1. Introduction

Foreign investors' trading behaviour in the local currency bond markets has been regarded as the source of financial instability in emerging market economies (EMEs). With dramatically increased participation in the local currency bond markets (Morozumi, Bleaney, and Sulistono 2024), foreign investors have been the channel of global shock transmission as they sell bonds, pushing up yields amid high global risks. This risk-averse behaviour is further reinforced by adverse feedback loop that works as follows. The net sales of bonds decrease bond prices (and increase yields), together with local currency depreciations, inducing further net sales by foreign investors. This is because local currency depreciations magnify the loss from bond investment. Hence, the initial decline in bond prices can potentially be amplified. Indeed, local currency long-term bond yields in Asian countries such as Indonesia, Malaysia, Thailand, and the Philippines tend to become more volatile during global stress periods. The recent events include the Global Financial Crisis (GFC) and the Euro Debt Crisis.

In this chapter, we provide a case study for South Korea (hereafter Korea) to examine the role of foreign investors' local currency bond trading behaviour in global shock transmission. Since Korea is one of the small-open economies in Asia, one may expect a large role played by foreign investors as it shares similar market characteristics with other SEACEN countries.[4] However, the data seems to suggest that Korea's local currency bond market is considerably more stable during the high global risk periods.

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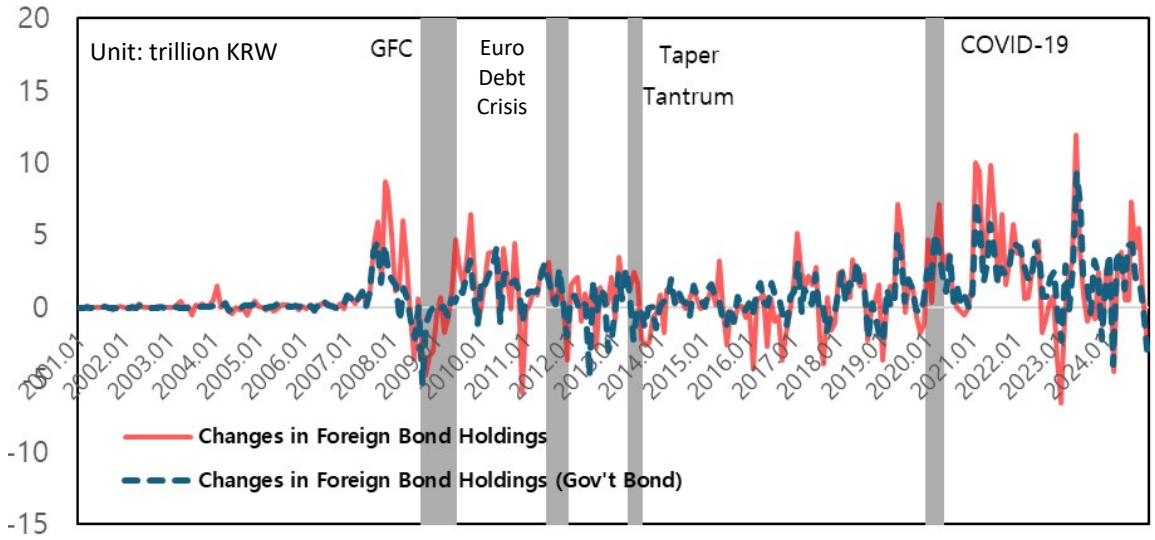
4. Korea's trade openness—defined as the sum of exports and imports relative to GDP—exceeds 80%, surpassing that of other SEACEN economies. Its financial openness registers 1.68 on the Chinn-Ito index, the fourth-highest value among SEACEN members.

Figure 1 illustrates that changes in foreign bond holdings of Korean government bonds have not decreased substantially during the recent three major global risk episodes (Euro Debt Crisis, Taper Tantrum, COVID-19) other than the GFC. In particular, it is worth mentioning that during the COVID-19 pandemic, foreign investors' holdings of Korean local currency bonds actually increased.

Figure 1: Changes in Foreign Bond Holdings in the Korean Local Currency Bond Market



Source: Authors' calculations based on data from the Ministry of Economy and Finance, Republic of Korea.

This observation is confirmed by Table 1 (retrieved from De Leo et al. 2025) below which displays ratios representing relative volatility of foreign investors compared to domestic investors. The median values for emerging markets and advanced economies are 1.27 and 0.74 respectively. The ratio for Korea is 0.46, meaning that the volatility of foreign investors is about a half of domestic agents.

Table 1: Volatility of Foreign and Domestic Investors in Local Currency Bond Market

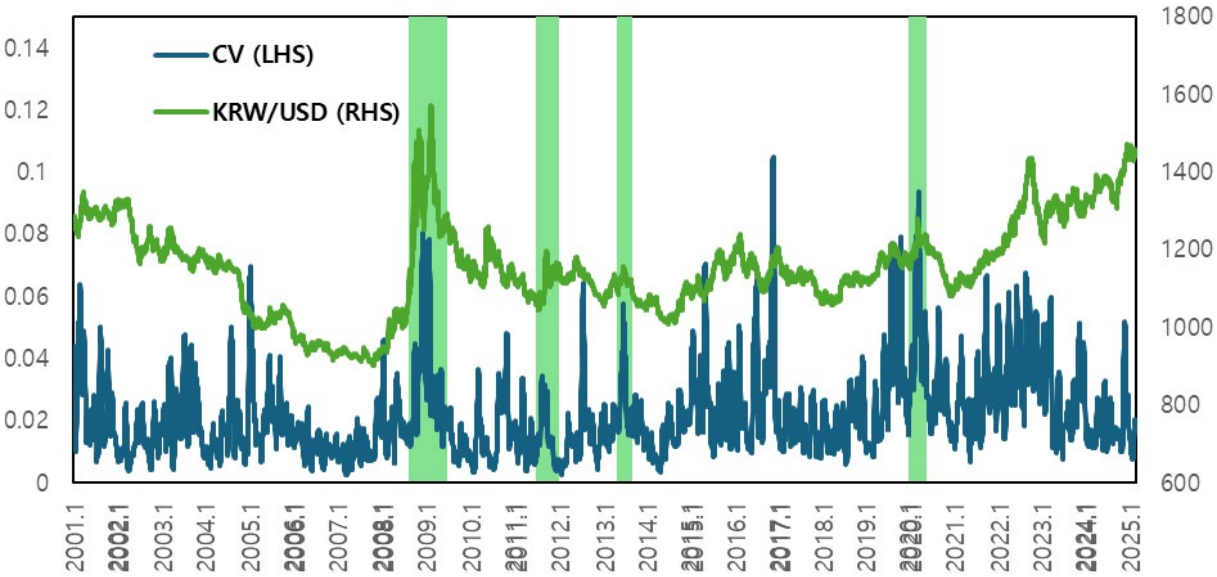
Country	Foreigners (Std. Dev. Share)	Domestic Non-Bank (Std. Dev. Share)	Ratio
Peru	13.71%	4.90%	2.8
China	4.02%	1.46%	2.76
Turkey	6.94%	3.68%	1.89
Indonesia	11.68%	6.63%	1.76
Uruguay	13.09%	7.47%	1.75
Hungary	11.60%	6.70%	1.73
Czech Republic	6.90%	4.10%	1.69
South Africa	9.89%	6.22%	1.59

Country	Foreigners (Std. Dev. Share)	Domestic Non-Bank (Std. Dev. Share)	Ratio
Ukraine	10.36%	6.75%	1.53
Mexico	12.44%	8.85%	1.4
Egypt	11.16%	8.09%	1.38
Malaysia	5.03%	3.94%	1.28
Argentina	10.49%	8.33%	1.26
Slovenia	14.46%	11.84%	1.22
Poland	8.51%	7.47%	1.14
Brazil	3.99%	3.52%	1.13
Thailand	4.22%	3.79%	1.11
Denmark	6.45%	6.05%	1.06
New Zealand	8.74%	8.31%	1.05
Russia	9.55%	9.39%	1.02
Sweden	8.81%	9.05%	0.97
Colombia	7.87%	8.68%	0.91
Norway	9.38%	10.78%	0.87
Switzerland	7.07%	8.83%	0.8
Philippines	3.66%	4.94%	0.74
Australia	6.97%	10.74%	0.65
United States	3.91%	5.82%	0.6
Romania	4.50%	7.67%	0.59
Canada	3.27%	6.15%	0.53
Korea	5.37%	11.68%	0.46
Chile	4.73%	10.81%	0.44
Japan	3.50%	11.80%	0.3
India	1.12%	4.63%	0.24
United Kingdom	2.96%	24.28%	0.12

Source: De Leo et al. (2025).

We further investigate whether government bond yields co-move with exchange rates for Korea. Figure 2 describes the volatility of 10-year government bond yields and the exchange rate (USD/KRW).[5] With stark contrast with other SEACEN economies, both the coefficient of variation (CV) and the exchange rate appear to be relatively stable. The only exemption is the GFC.[6] The coefficient of variation did not exceed 0.1 even during the GFC and the COVID-19 pandemic. The rise in the late 2016 to the level close to 0.1 was not because of global risk but was due to Korea's domestic political uncertainty.

Figure 2: Coefficient of Variation of the 10-Year Korean Government Bond Yield and Exchange Rate (KRW/USD)



Source: Authors' calculations based on data from the Bank of Korea.

In sum, we conclude that the Korean local currency government bond market is less susceptible to global risks, making it an exceptional case compared to other SEACEN economies. What are the primary factors that have contributed to its relative stability amid global risks? In the next section, we address these questions and provide policy implications.

5. It is the price of US dollar in units of Korean Won. It increases (decreases) when Won depreciates (appreciates).

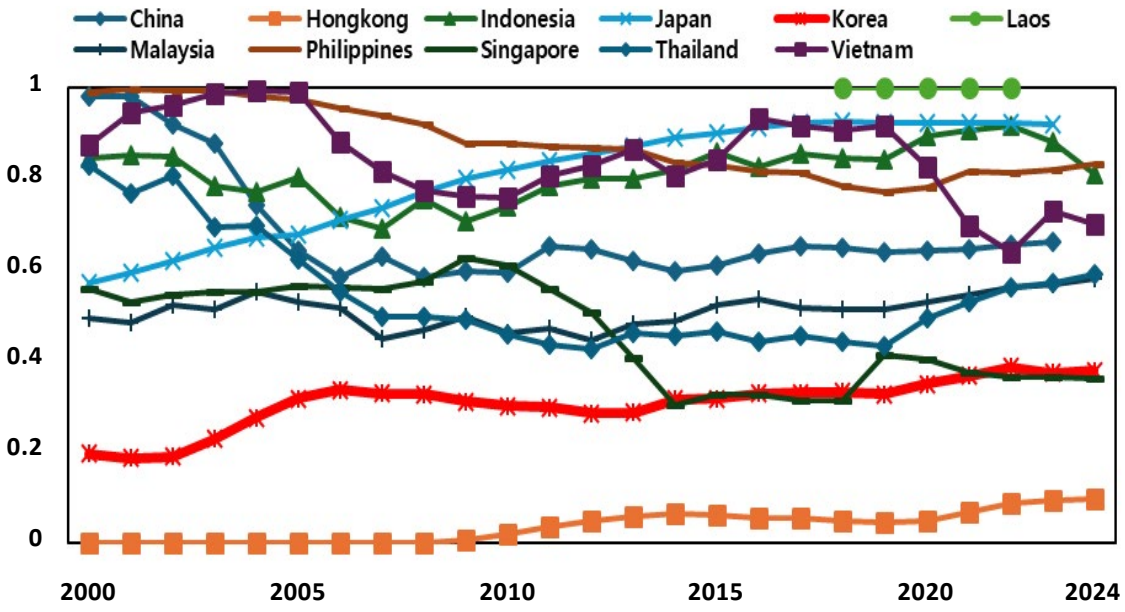
6. One can find a similar observation based on the implied volatility for the exchange rate.

2. Inspecting Possible Reasons

2.1 Small Government-bond Share and Low Foreign Investor Participation Relative to Market Size

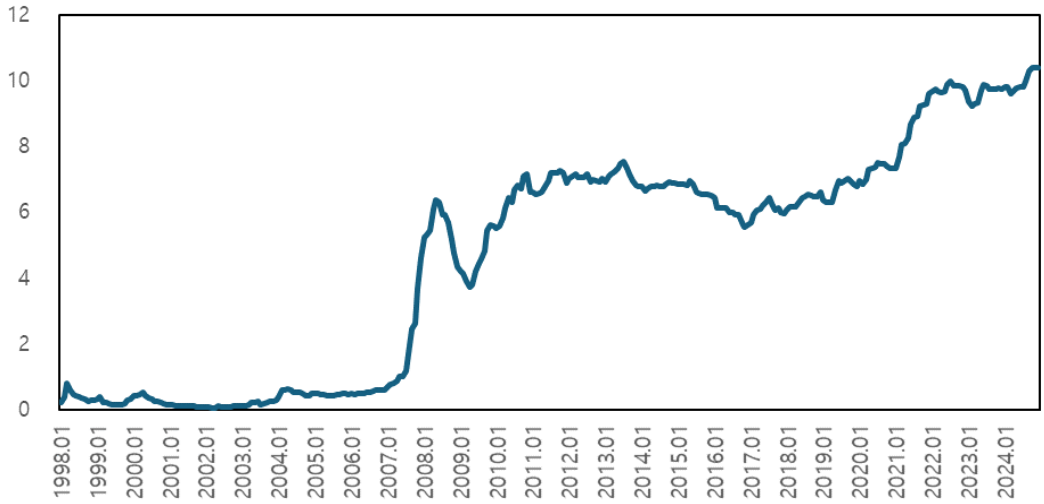
There are two distinct features of Korea's local currency government bond market. First, the size of the local currency government bond market is relatively small compared to the total bond market, particularly when compared to other EMEs (Figure 3). Specifically, among 11 Asian EMEs, Korea ranks the lowest in terms of the relative size of its local government bond market to the total bond market, except for Hong Kong. Second, the share of local currency government bonds held by foreign investors is relatively low. The proportion of foreign holdings rose to around 6% in 2007 and remained approximately at 7% until 2021, which is considerably lower than the levels observed in other SEACEN EMEs, where foreign participation rates exceeded 15% from the mid-2010s through 2021. In this context, Kim, Park, Park, and Tian (2023) document that Korea's local-currency bond-market development—measured by the ratio of local-currency bond liabilities to nominal GDP—ranks second among Asian economies, behind only Japan.

Figure 3: Share of Government Bonds in Local Currency Bond Market



Source: Asian Bonds Online.

Figure 4: Share of Local Currency Bond Holdings Held by Foreign Investors in Korea



Source: Ministry of Economy and Finance, Republic of Korea.

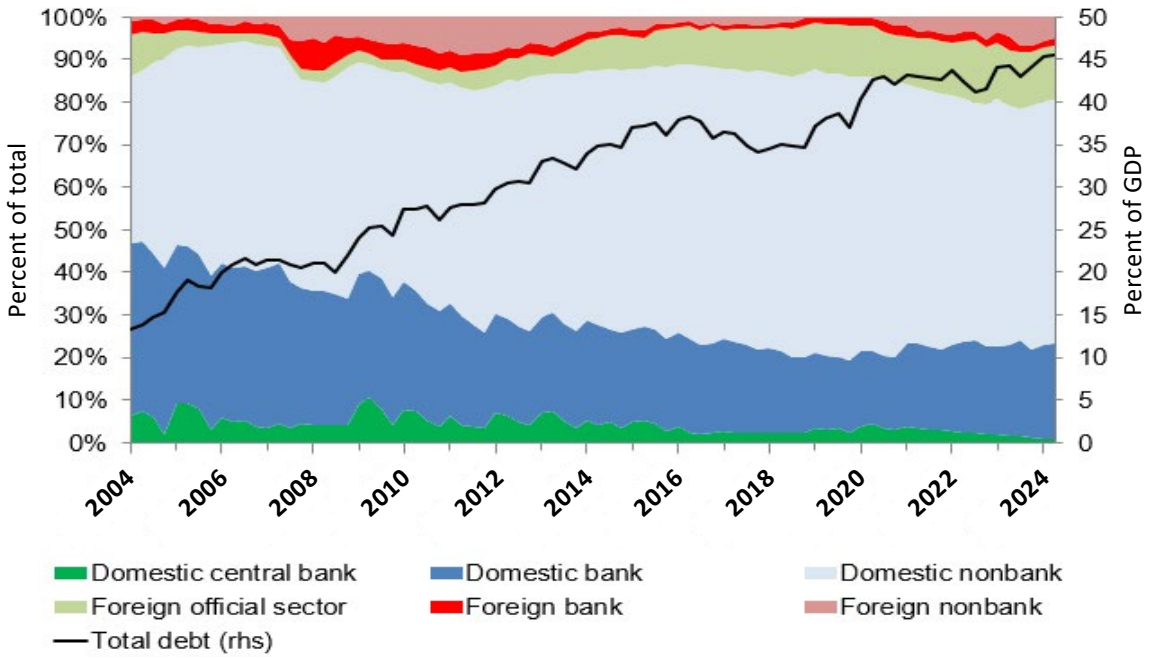
These features critically contribute to Korea's lower vulnerability to global risks. Taken together, the relatively small size of government debt compared to the domestic financial market suggests a lower government debt level relative to the degree of financial development, while the low share of government bonds held by foreign investors implies limited external debt exposure. As noted by Hofmann, Shim and Shin (2020), lower financial market development combined with higher exposure to external shocks—through greater reliance on external debt—can heighten the vulnerability of EMEs' local currency bond markets to global shocks. However, in Korea's case, the combination of a relatively small government bond market and limited foreign participation, compared to its market development, helps mitigate these risks.

2.2 Large Shares of Public Investors (Foreign Central Banks, Sovereign Wealth and Public Funds)

The composition of foreign investors in the local-currency sovereign bond market also affects its stability. Although the empirical literature is still limited, the evidence to date indicates that mutual funds is the investor class most sensitive to global shocks and, therefore, the most likely to cut their exposure to EME bonds during periods of stress. For example, Ng, Shim and Pastor (2019) show that mutual funds withdrew from Asian EME bond markets during the 2013 "taper tantrum". Bertaut, Bruno and Shin (2023) reach a similar conclusion, finding that mutual funds retrench from EME bonds when macro-financial conditions deteriorate. These withdrawal episodes can be amplified by benchmark effects—that is, by the tendency of global investors to track changes in major bond indices such as those produced by J.P. Morgan. When benchmark-driven investors adjust their portfolios in tandem, capital flows become more volatile (Arslanalp and Tsuda, 2015).

Importantly, mutual funds are not the dominant foreign holders of Korean local-currency government bonds, and Korea is not included in J.P. Morgan's GBI-EM indices, the principal benchmarks for EME debt.[7] As Figure 5 shows, foreign non-bank investors, which encompass mutual funds, hold less than 10% of Korean government debt. By contrast, foreign central banks, sovereign-wealth funds and public pension funds represent the lion's share of foreign holdings of Korean won denominated government bonds (about 61% as of April 2021, according to official data). Because such public investors typically pursue longer-term, diversified strategies, they are less inclined to engage in short-term trading. We therefore view their predominance as an additional factor contributing to the relative stability of Korea's local-currency bond market.

Figure 5: Holders of Korean Government Debt



Source: Arslanalp and Tsuda (2014, updated).

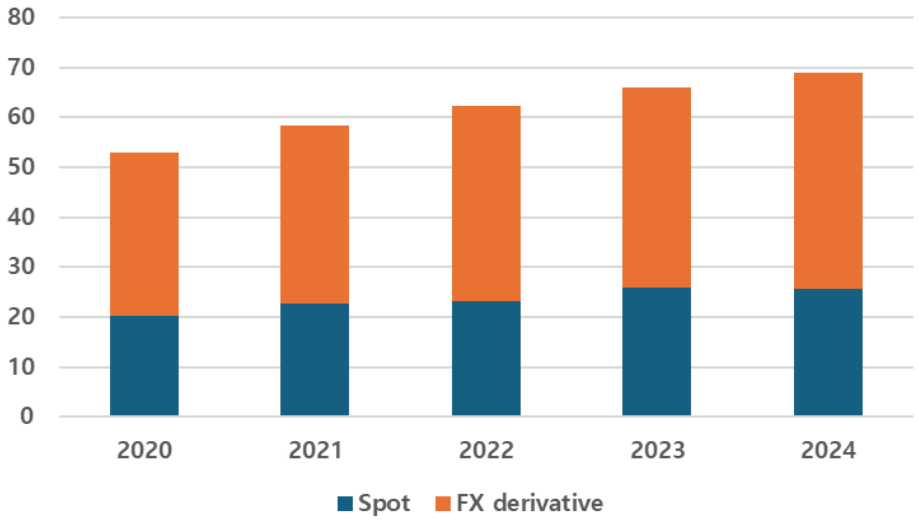
3. Foreign Investors' Hedging Demand

Korea has a relatively large foreign exchange (FX) derivatives market, which allows foreign investors to hedge exchange-rate risk ex ante and thus dampens the impact of expected currency movements on capital flows. It is well-known that foreign investors hedge their position when investing in Korean local-currency bond. To be specific, foreign investors go to the FX derivatives market instead of the spot market to obtain Korean Won. They make a FX swap contract to borrow Korean Won in exchange for US dollars (i.e.,

7. Korea was initially incorporated into the index at its inception but was subsequently removed on the grounds that it no longer satisfied the eligibility criteria for classification as a low- or middle-income economy (Arslanalp & Tsuda, 2015). Indeed, the International Monetary Fund currently classifies Korea as an advanced economy.

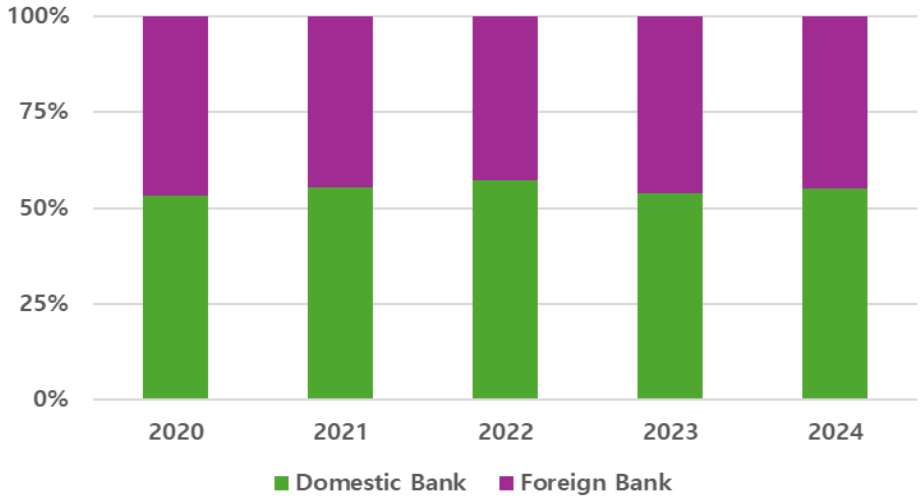
a sell-and-buy swap) and purchase bonds to hedge against possible exchange change risks. By locking in the forward KRW/USD rate in this way, foreign investors greatly attenuate the influence of expected currency movements on their bond-portfolio decisions. Indeed, the data shows in Figure 6 that the size of the FX derivatives market is almost twice that of the spot market in 2024. The average daily trade in the spot market is 25.67 billion dollars, while it is 43.29 billion dollars in the FX derivative market. Foreign investors' transactions are often intermediated by foreign banks which trade mostly in FX derivative markets. Figure 7 shows that foreign banks, which intermediate foreign investors' transactions, account for about half of market participants in Korean FX markets. More importantly, foreign investors trade more in FX derivatives. Out of the 24.97 billion dollars of their daily average trade, 78.3% was done in the form of FX derivatives.

Figure 6: Market Size of Spot and Derivative Markets in Korea (Billions of Dollars)



Source: Bank of Korea.

Figure 7: Market Participation in FX Markets in Korea (Billions of Dollars)

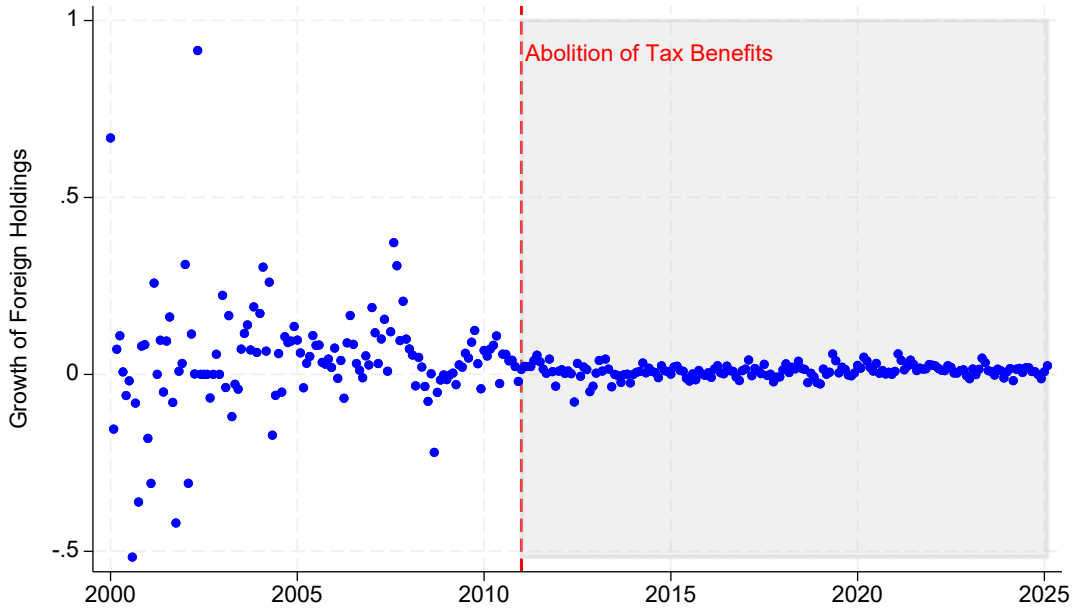


Source: Bank of Korea.

4. Macroprudential Policy Operations

After experiencing capital outflows during the Global Financial Crisis, Korea implemented three macroprudential measures targeting FX-related activities. These were: (i) caps on FX derivatives positions (introduced in October 2010); (ii) a macroprudential levy on banks' non-core foreign-currency liabilities (August 2011); and (iii) the abolition of tax incentives for foreign investors in the Korean sovereign-bond market (January 2011). Among other measures, this third measure is the one that impacted the local-currency bond market most directly. Indeed, Figure 8 corroborates this conjecture by showing that the volatility of the growth rate of foreign holdings declined after the tax benefits were removed.

Figure 8: Growth of Foreign Holdings Before and After Policy Implementation



Source: Authors' calculations based on data from the Ministry of Economy and Finance, Korea.

To examine the policy's effectiveness in reducing the volatility of changes in foreign holdings, we estimate a simple GARCH(1, 1)-X model as follows:

$$\Delta \ln(GB_t) = \mu + \epsilon_t$$

$$\sigma_t^2 = \exp(\lambda_0 + \lambda_1 \ln(GB_{t-1}) + \lambda_2 Post_t)(\omega + \alpha\epsilon_{t-1}^2 + \beta\sigma_{t-1}^2)$$

In this specification, the coefficient λ_2 captures the policy effect, as it reflects the difference in the conditional volatility of the log change in foreign holdings of government bonds before and after January 2011. To control for a potential level effect, we include the logarithm of foreign holdings in period t – 1, because the growth rate generally exhibits lower variance as the holding size increases. The table below shows that the conditional volatility of growth of foreign holdings, measured in log differences, declined significantly after the macroprudential policy was implemented. Specifically, the conditional standard

deviation declined to approximately 37% of its pre-January 2011 level.[8] This result confirms that macroprudential policy change was indeed one of the important factor for the stability of the Korean local-currency government-bond market.

Table 2: Estimation Results of the GARCH-X Model

VARIABLES	(1) Mean Eq.	(2) HET Eq.	(3) ARCH Eq.
$\ln(GB_{t-1})$		-0.48***	
		(0.04)	
Post dummy		-1.97***	
		(0.16)	
ϵ_{t-1}^2			0.07*
			(0.04)
σ_{t-1}^2			-0.19
			(0.28)
Constant	0.01***	0.69*	
	(0.00)	(0.35)	
Observations	302	302	302
LogLik	523.5	523.5	523.5

5. Policy Implications

Based on Korea's experience, several policy implications emerge for enhancing the stability of local-currency bond markets. First, broadening the investor base is crucial: countries that face high volatility in their domestic bond markets should attract a more diverse set of investors rather than relying predominantly on mutual funds. Second, these countries should strengthen their liquidity buffers to bolster resilience during global risk episodes that could trigger large capital outflows. This is particularly important for markets whose sovereign yields are included in global benchmark indices, as they are more exposed to adverse external shocks. Third, developing deep FX derivatives markets that enable foreign investors to hedge exchange rate risk can lessen the influence of expected currency movements on bond flows. Finally, well-calibrated macroprudential measures remain essential for fostering a stable market environment.

8. Employing an Exponential-GARCH(1,1) specification, we find that the post-policy dummy exerts a large and statistically significant effect on volatility (Coefficient = –2.39, p-value = 0.002), indicating that the macroprudential policy markedly reduces the conditional variance of the growth of foreign holdings. Furthermore, guided by the AIC, we adopt the GARCH(1,1)-X specification that excludes the yield-level control; under this preferred model, the macroprudential policy still reduces the conditional standard deviation of the 10-year bond yield to roughly 62% of its pre-policy level. Taken together, these two findings buttress our baseline conclusions regarding the effectiveness of macroprudential policy.

6. Concluding Remarks

We conclude that foreign investors play only a modest role in transmitting global shocks to Korea's local-currency government-bond market. Four structural features underpin this resilience: (i) Limited foreign exposure. Foreign holdings remain small in absolute terms and relative to the size of Korea's overall bond market; (ii) Dominance of public investors. The foreign investor base is led by central banks, sovereign-wealth funds and public pension funds, entities with long horizons and low turnover; (iii) Deep FX-derivatives market. A well-established swap market allows foreign investors to hedge KRW exchange-rate risk efficiently, muting currency-driven outflows; and (iv) Preemptive macroprudential framework. The removal of tax incentives for non-resident bondholders have reduced leverage and short-term funding pressures. Together, these elements show how a diversified investor mix, ample hedging instruments and targeted macroprudential tools can enhance the external resilience of a local-currency bond market, offering a useful template for other EMEs seeking to curb volatility arising from global risk episodes.

References

Arslanalp, S., & Tsuda, T. (2014). Tracking global demand for advanced economy sovereign debt. IMF Economic Review. Palgrave Macmillan. International Monetary Fund, Vol. 62(3), pp. 430-464.

Arslanalp, S., & Tsuda, T. (2015). Emerging market portfolio flows: The role of benchmark-driven investors. IMF Working Papers 2015/263l. International Monetary Funds.

Beirne, J., Renzhi, N., & Volz, U. (2021). Local currency bond markets, foreign investor participation, and capital flow volatility in emerging Asia. ADBI Working Papers No 1252.

Bertaut, C., Bruno, V., & Shin, H. (2023). Original sin redux: Role of duration risk. BIS Working Papers 1109, Bank for International Settlements.

De Leo, P., Keller, L., Simoncelli, G., Villamizar-Villegas, M., & Williams, T. (2025). Global investors in local-currency bond markets: Implications for bond yields and exchange rates. Available at SSRN.

Kim, C., Park, D., Park, J., & Tian, S. (2023). Local currency bond market development and currency stability amid market turmoil. ADB Economics Working Paper Series. 688.

Morozumi, A., Bleaney, M., & Sulistiono, A. P. (2023). Types of foreign investor and local-currency bond markets in emerging economies. Available at SSRN 4586788.

Ng, D., Shim, I., & Pastor, J. (2019). The role of different institutional investors in Asia-Pacific bond markets during the taper tantrum. BIS Paper No. 102m.

Chapter 6

CHINESE TAIPEI AND THE IMPACT OF FOREIGN INVESTOR TRADING ON LOCAL-CURRENCY GOVERNMENT BOND MARKETS

By
Christine (Wei-ting) Wang[1]

1. Introduction

The liberalisation of Chinese Taipei's financial markets since the early 2000s has resulted in increasing participation by foreign investors in its local-currency government bond (LCGB) market. While this trend reflects Chinese Taipei's deeper integration into global capital markets, it also introduces volatility and policy challenges.

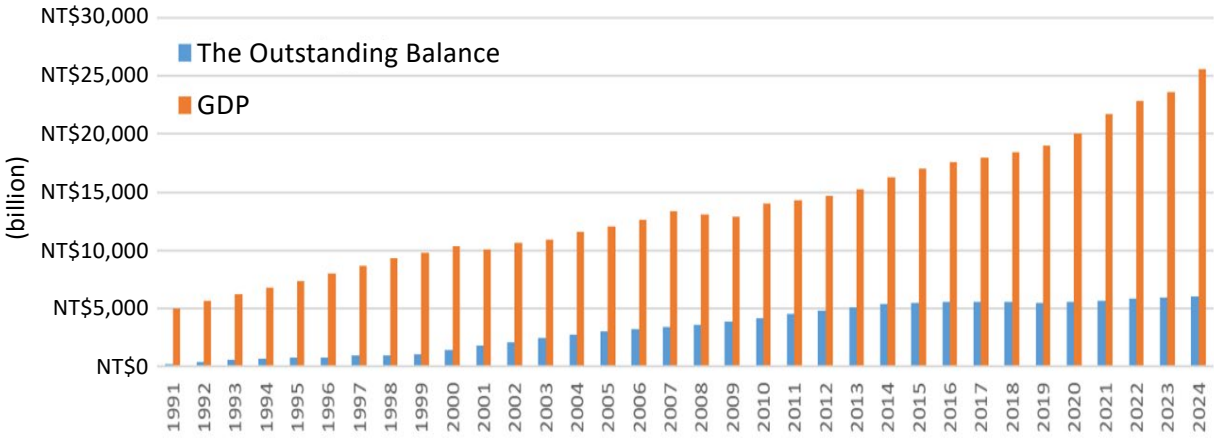
In Chinese Taipei's context, short-term cross-border capital movements have become a significant factor influencing the New Taiwan dollar (NT$) exchange rate. To prevent large capital inflows from leading to excess liquidity being parked in financial markets without being channeled into real investments—thereby exerting downward pressure on domestic interest rates—it is essential to safeguard the effective transmission of the Central Bank's monetary policy. As emphasised by the Boris et al. (2020), emerging market economies (EMEs) with robust monetary policy frameworks—capable of addressing the feedback loop between exchange rate depreciation and capital outflows—are better positioned to weather external financial shocks such as those brought on by the Covid-19 pandemic. Therefore, when designing regulatory responses, financial supervisory authorities must adopt a holistic perspective. In addition to safeguarding financial stability, it is crucial to concurrently support industrial development and uphold investor protection—both of which are foundational pillars of a resilient and well-functioning financial system.

This chapter investigates the evolving structure of Chinese Taipei's government bond market, the underlying drivers of foreign investor behaviour, and the broader implications of their activities on domestic financial stability and monetary policy.

1 The author is an Assistant Research Fellow at the Department of Foreign Exchange, Central Bank, Chinese Taipei (CBCT). The author gratefully acknowledges the guidance and valuable comments provided by colleagues at the Central Bank and by representatives of the commissioning institution. The views expressed in this paper are those of the author and do not necessarily represent the official position of the Central Bank. The use of the term "Chinese Taipei" in this context is not a decision made by the author.

2. Evolution of Chinese Taipei's Government Bond Market

Figure 1: Total Outstanding Balance of Chinese Taipei's Government Bond



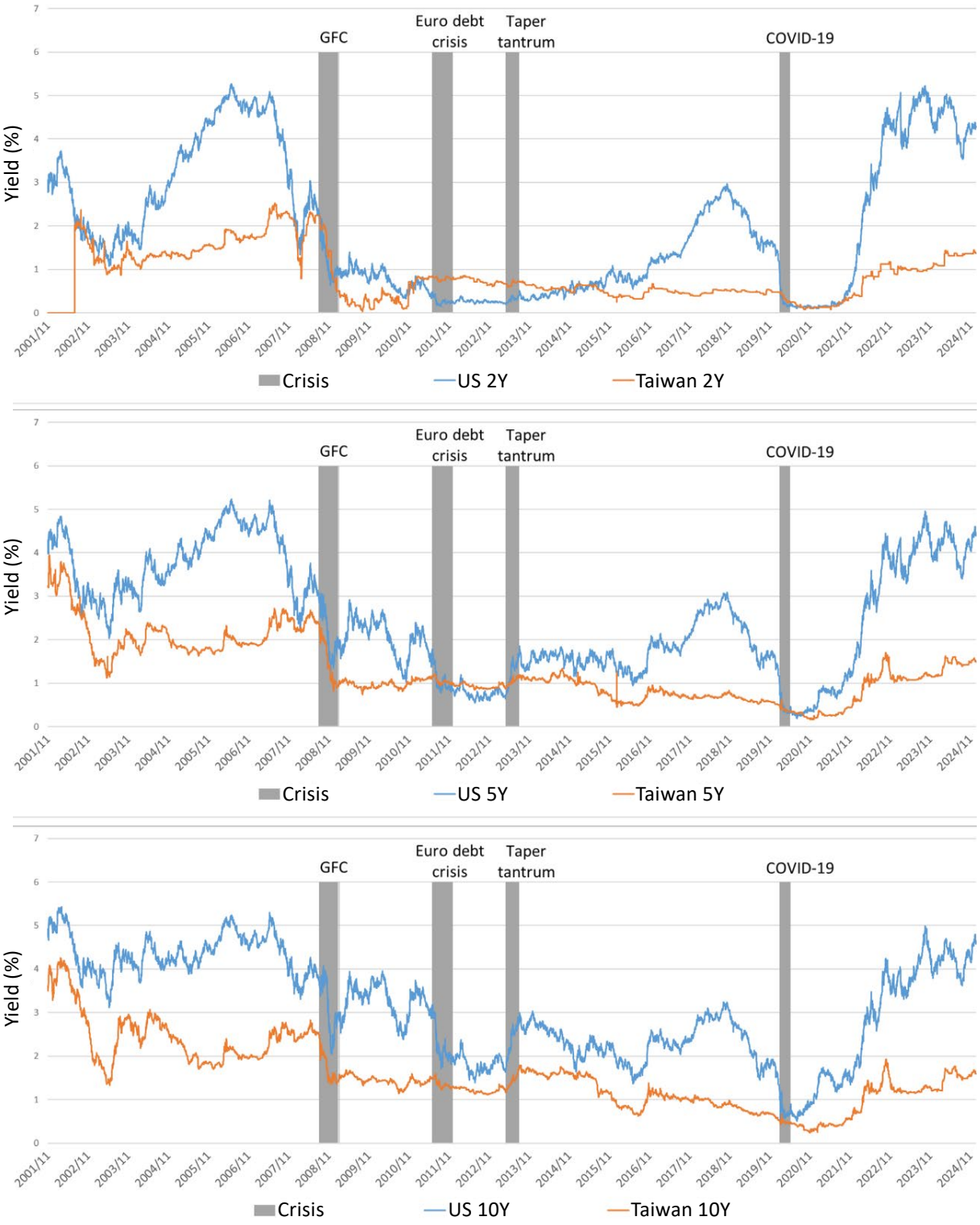
Source: CBCT.

Since the early 1990s, Chinese Taipei's government bond market has expanded significantly. From a total outstanding balance of NT$551.7 billion in 1993, the market had grown to NT$6.03 trillion by the end of 2024. However, this increase in issuance has occurred alongside strong fiscal discipline. According to the Public Debt Act, which sets strict ceilings on central government debt, the outstanding debt must not exceed 40% of the average Gross Domestic Product (GDP) of the previous three years (Figure 1), and the annual net increase in debt must also remain within a specified budgetary framework approved by the Chinese Taipei's Parliament. This fiscal discipline has prevented an oversupply.

In contrast to the supply side, Chinese Taipei's persistent excess savings have been a key factor contributing to the strong domestic demand for the LCGB market. Domestic financial institutions hold roughly half of the outstanding bonds as long-term liquidity reserves, further limiting market liquidity. Strong household savings, cautious corporate investment behaviour, and limited domestic consumption have led to surplus capital being channeled into low-risk government bonds, meaning there has been no need for Chinese Taipei to rely on foreign investors to lower the government's funding costs.

This structural feature has pushed yields lower across both short- and long-term maturities compared to the United States, as shown in Figure 2. Therefore, foreign investors have little to no yield incentive in purchasing Chinese Taipei's LCGB.

Figure 2: Yields of Chinese Taipei's LCGB and U.S. Treasuries



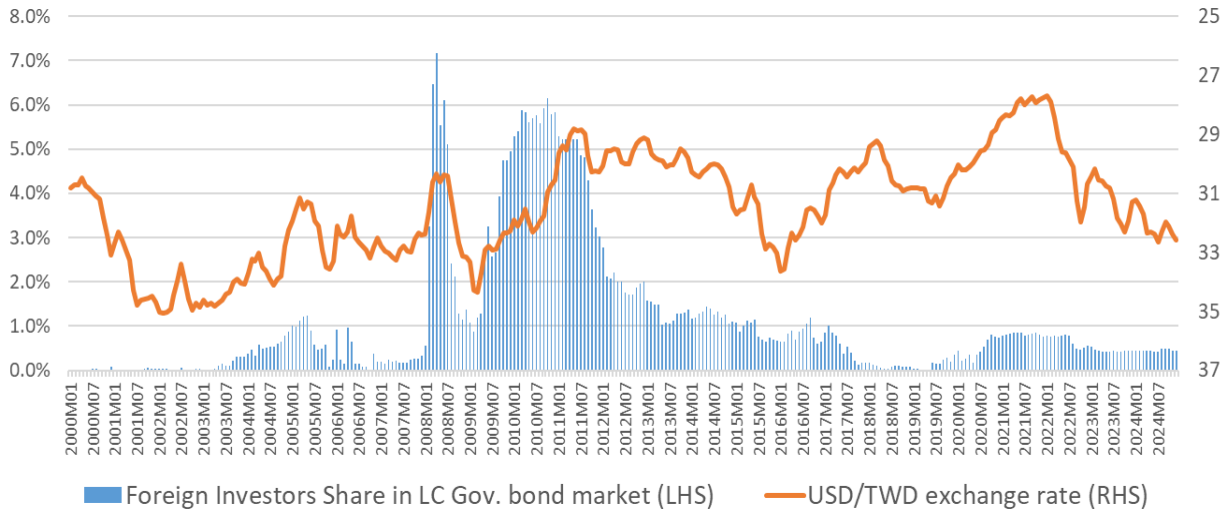
Source: TPEx and Bloomberg.

3. Foreign Investor Participation: Trends and Strategies

Following the abolition of the Qualified Foreign Institutional Investor (QFII) system in 2003 and the removal of investment quotas, foreign investor participation in Chinese Taipei's LCGB market gradually increased. However, the nature of this participation has been largely short-term and speculative.

Figure 3 shows that the proportion of foreign holdings balance of Chinese Taipei's government bonds increased rapidly at the beginning of 2008, reaching a record of 7.16% in April 2008, accompanied by a rapid appreciation of the foreign exchange rate. From July onwards, owing to the bankruptcy of Lehman Brothers and the escalating subprime mortgage crisis, investors tended to hold the US dollar to cope with the high liquidity risk under the crisis. The outflows of foreign capital caused the NT dollar to depreciate to 33.550 against the US dollar on December 4, the lowest level of the year and foreign holdings of domestic government bonds shrank to 1.37% by the year end.

Figure 3: Foreign Investors Share in Chinese Taipei's Government Bond Market

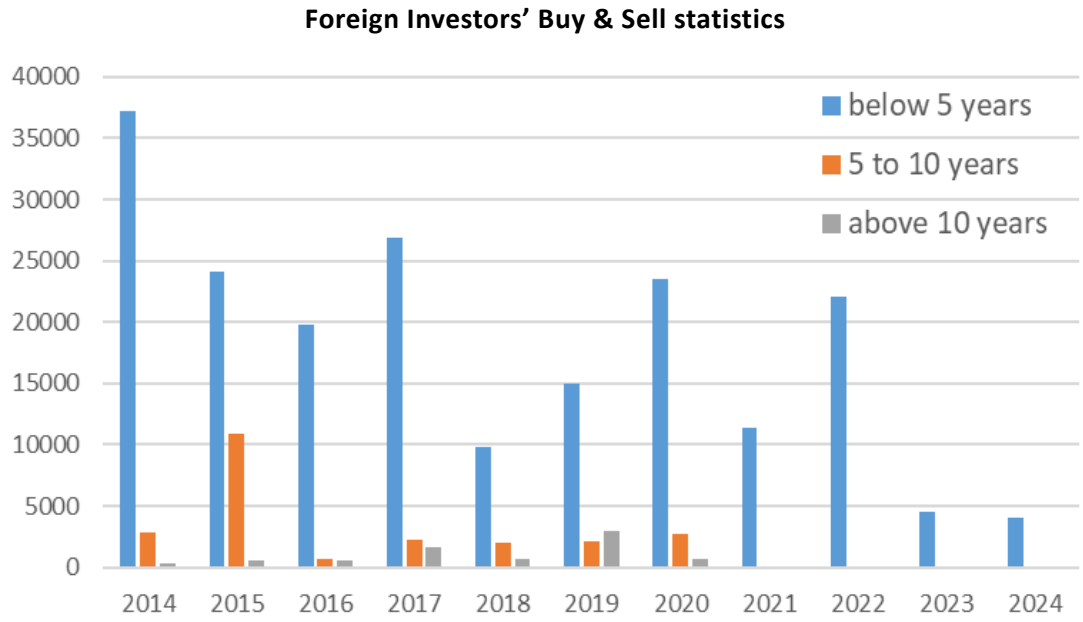


Source: CBCT.

In 2010, the influx of global hot money into emerging market (EM) economies, driven by the Quantitative Easing (QE) monetary policies implemented by major developed nations, led to a significant appreciation of the NT dollar in the fourth quarter. As a result, foreign investors' holdings once again exceeded 5%, and remained relatively high, fluctuating between 4% and 6%. Since 2011, foreign holdings have experienced a declining trend, shrinking to around 2% within one year. Subsequently, foreign investors continued to reduce their holdings. Even though the NT dollar went through a cycle of appreciation and depreciation, foreign ownership remained below 1%.

According to statistics from the Taipei Exchange (TPEx) in Figure 4, more than 80% of foreign-held bonds are of less than five years in maturity, with many investors choosing to sell even longer-term bonds shortly after acquisition. This indicates a preference for tactical trading strategies rather than long-term yield investment.

Figure 4: Foreign Investors' Trading Statistics



Source: TPEx since 2014.

4. External and Domestic Drivers of Foreign Capital Flows

Most studies in the literature identify a strong positive correlation between capital inflows into emerging markets and global commodity prices. Three commonly cited mechanisms underpin this relationship. First, in commodity-exporting emerging markets, rising commodity prices directly boost trade surpluses, thereby improving external balances and attracting foreign capital. Second, both commodity prices and capital inflows may respond to a common driver—namely, accommodative global financial conditions, particularly low interest rates. Third, lower global interest rates reduce sovereign default risk, enhancing the relative attractiveness of emerging market assets. However, these explanations are less relevant in the case of Chinese Taipei, which is a net capital exporter with a strong current account surplus and limited dependence on primary commodity exports.

Instead, this study seeks to identify the key determinants of foreign investor behaviour in Chinese Taipei's LCGB market, with a focus on both external and domestic macro-financial conditions. Previous work by Ho and Yeh (2014) highlights that external factors such as lower U.S. real interest rates and a declining global Consumer Price Index (CPI) tend to stimulate foreign portfolio investment in Chinese Taipei, as investors search for higher real yields. In addition, Arslanalp et al. (2020) emphasise the importance of

the push–pull framework in explaining portfolio flows to emerging markets, particularly under the growing influence of benchmark-driven investments. In this context, push factors (external conditions) such as global risk sentiment or interest rate levels tend to drive synchronised capital flows across benchmark-included countries, while pull factors (domestic fundamentals) explain variation across individual markets.

Guided by this literature, the present research empirically investigates three external "push" factors: (1) the VIX (Volatility Index), as a proxy for global risk aversion; (2) the U.S. 10-year Treasury yield, reflecting global interest rate conditions; and (3) global CPI, indicating inflationary trends that influence real returns. The estimation equation is as follows:

$$Foreign\ Investors'Net\ Purchase_t = \alpha + \beta\ \Delta VIX + \gamma\ \Delta Rate_t + \delta\ \Delta Global\ CPI_t + \varepsilon_t$$

In parallel, seven domestic "pull" factors are examined to capture Chinese Taipei-specific conditions that may influence foreign investor participation. These include: (1) domestic CPI, (2) import price index, (3) export price index, (4) TAIEX stock market returns, (5) the 1-month USD/TWD NDF (non-deliverable forward) rate, (6) FX appreciation rate, and (7) changes in Chinese Taipei's foreign exchange reserves. The estimation equation is as follows:

$$Foreign\ Investors'Net\ Purchase_t = \tilde{\alpha} + \sum_{i=1}^{7} \tilde{\beta}_i\ Domestic_{i,t} + \varepsilon_t$$

Where $\tilde{\beta}_i$ are parameters to be estimated corresponding to $Domestic_{it}$ as the role of economic fundamental variables.

Table 1: Summary Statistics

	Mean	Median	St. Dev	Min	Max
External factors:					
Δ VIX	-0.00020	-0.00285	0.00320	-0.19390	0.21270
Δ US 10y yields (%)	0.00285	0.01215	0.01608	-1.03300	0.89220
Δ Global CPI ex. Oil	0.39358	0.42562	0.20808	-14.5016	11.8973

Sources: VIX and US 10y yield from Bloomberg; Global CPI ex. Oil from IMF Primary Commodity Prices database.

	Mean	Median	St. Dev	Min	Max
Domestic factors: Macro fundamentals, policy variables, and financial market					
Δ Import Price Index	0.11943	0.17	0.10349	-9.3	3.78
Δ Export Price Index	-0.00110	0.07	0.06127	-6.03	2.28
Δ CPI season adj.	0.10292	0.11	0.01695	-0.85	1.26
Δ FX Reserves percentage	0.00476	0.00311	0.00057	-0.03124	0.04394
1M FX appreciation rate	0.00032	0.00053	0.00069	-0.03691	0.03713
1M USD/TWD NDF	-0.05632	-0.05	0.00494	-0.385	0.365
TAIEX return (%)	0.711	0.975	0.274	-18.710	16.210

Sources: Import/Export Price Index and CPI where the base year is 2021 from National Statistics, Chinese Taipei; FX reserve, 1M FX appreciation rate $= (FX_{t-1}$ - $FX_t)/FX_t$ *, and TAIEX return is calculated based on the Taiwan Stock Exchange Capitalisation Weighted Stock Index from CBCT; 1M USD/TWD NDF* $= Forward_{t+1M} - FX_t$ *from Bloomberg.*

The whole regression sample period is monthly data from January 2003 to December 2024. This study also conducts a sub-period regression analysis for the period from March 2006 to December 2014. This time frame is selected due to the relatively high and volatile levels of foreign holdings in Chinese Taipei's LCGB market during these years, which enhances the statistical power and relevance of the empirical tests. This study focuses on the cross-sectional relationship between net foreign holdings of government bonds and the selected macro-financial variables, rather than on their dynamic time-series interactions. Accordingly, a simple linear regression framework is adopted to identify the contemporaneous associations among variables.

To address potential concerns regarding multi-collinearity, a series of robustness checks are conducted. These include re-estimating the baseline models after removing potentially collinear variables. The results of these robustness tests are reported in the Appendix.

4.1 External Factors

Foreign investment in Chinese Taipei's LCGBs is weakly correlated with traditional global macroeconomic indicators. Regression analyses show that variables such as the U.S. 10-year Treasury yield and the VIX (a proxy for global risk sentiment) do not significantly explain the behaviour of foreign investors in Chinese Taipei's bond market. Among the tested global indicators, only global CPI (inflation) demonstrates statistical significance, suggesting that this indicator may potentially serve as a proxy for the monetary policy expectations of major economies or the appreciation and depreciation of the U.S. dollar to some extent.

Interestingly, while lower U.S. real interest rates generally incentivise outward capital flow into higher-yielding markets, the impact on Chinese Taipei LCGB market is muted. In addition, the low R-squared value from the regression analysis suggests that external variables play only a minimal role in explaining foreign investors' decisions to invest in LCGB. Finally, even for the sub-period result with the relatively high and volatile levels of foreign holdings, the conclusion is the same and there is not much improvement on explanation ability.

Table 2: Regression Results on Sensitivity to External Factors

	Period: 2003/1~2024/12		Period: 2006/3~2014/12	
	Coeff.	Std	Coeff.	Std
Δ VIX	-0.2859	0.4606	0.0187	1.1363
Δ US 10y yields (%)	-0.1027	0.0922	-0.2307	0.2190
Δ Global CPI ex. Oil	0.0367 ***	0.0072	0.0645 ***	0.0151
Constant	-0.0126	0.0239	-0.0169	0.0563
R Square	0.0919		0.1517	
Adj-R Square	0.0814		0.1267	
F-statistic	8.77		6.08	
Observation	264		106	

*Note: *, **,*** indicate a significance level of 5%, 1% and 0.5%.*

4.2 Domestic Factors

The regression results indicate that domestic macroeconomic variables such as the CPI, import/export prices, and TAIEX stock market returns do not have a statistically significant impact on foreign investment in Chinese Taipei's government bond market. The most significant domestic driver is the expected depreciation of the New Taiwan Dollar (NTD), for which the 1-month USD/TWD Non-Deliverable Forward (NDF) rate was used as a proxy. Regression results show a strong inverse relationship between the expected depreciation rate and foreign bond holdings. Investors anticipating NTD appreciation tend to park funds in the bond market, seeking to capture both currency gains and returns from government bond yields.

The exchange rate appreciation variable is found to be only weakly significant over the full sample period and statistically insignificant in the sub-period analysis, suggesting that currency movements may not be a primary driver of foreign investor behaviour in Chinese Taipei's LCGB market. In contrast, foreign exchange reserves exhibit a strong and consistent positive correlation with foreign holdings. This likely reflects the central bank's active role in managing exchange rate stability amid capital inflows. In particular, the

accumulation of reserves may serve both as a signal of policy credibility and as a buffer against currency volatility, thereby creating a more favourable environment for sustained foreign participation.

Table 3: Regression Results on Sensitivity to Domestic Factors

	Period: 2003/1~2024/12		Period: 2006/3~2014/12	
	Coeff.	Std	Coeff.	Std
Δ Import Price Index	0.0226	0.0273	-0.0087	0.0509
Δ Export Price Index	-0.0152	0.0445	-0.0165	0.0873
Δ CPI season adj.	0.0468	0.0844	0.1628	0.1805
Δ FX reserves percentage	12.6568***	2.7050	24.0402 ***	5.9016
1M FX appreciation rate	5.4684*	2.5237	12.4367	6.5085
1M USD/TWD NDF	-1.1897***	0.2880	-1.4961 ***	0.5609
TAIEX return	-0.2589	0.5572	-0.4945	1.0755
Constant	-0.1331***	0.0302	-0.1976 ***	0.0618
R Square	0.2896		0.4375	
Adj-R Square	0.2701		0.3973	
F-statistic	14.91		10.89	
Observation	264		106	

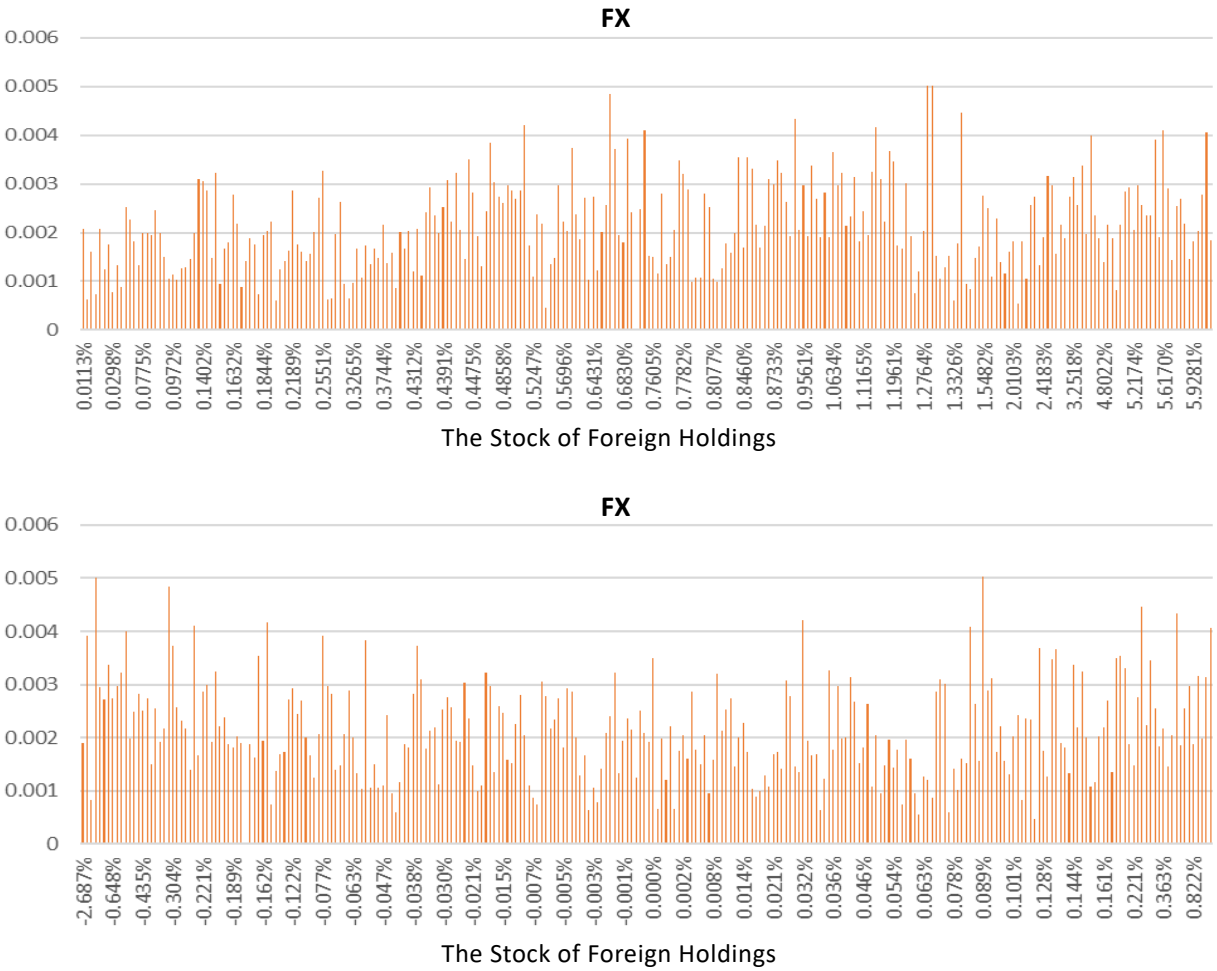
*Note: *, **,*** indicate a significance level of 5%, 1% and 0.5%.*

5. Impacts on Financial Stability and Market Functioning

5.1 Exchange Rate Volatility

Since foreign capital inflows—particularly those driven by currency speculation—can amplify exchange rate volatility, the treatment of LCGBs by foreign investors as temporary parking vehicles may result in abrupt inflows and outflows, leading to fluctuations in the NT dollar. Such volatility poses particular challenges for Chinese Taipei's export-oriented economy, where maintaining exchange rate competitiveness is essential. To evaluate the relationship between foreign investor activity and exchange rate volatility, this section analyses FX movements by sorting both the stock and the flow of foreign holdings in LCGBs.

Figure 5: Foreign Exchange Rate Volatility



Source: CBCT.

The figures indicate that exchange rate volatility exhibits no clear pattern in relation to either the stock or the flow of foreign holdings. This may suggest that Chinese Taipei's central bank operates a managed floating exchange rate regime, actively smoothing excessive short-term fluctuations without altering the long-term trends.

5.2 Interest Rate Volatility

Another important issue is to examine the spillover effects of foreign capital outflows on domestic interest rate volatility, particularly during periods of market stress. Recent studies have highlighted that, under such conditions, foreign investors may choose to liquidate highly liquid government bonds and repatriate funds, rather than reallocating from equities to fixed-income assets. This behaviour has been documented in the IMF Global Financial Stability Report (2020), which shows that during the COVID-19 crisis, even traditionally safe and liquid assets—such as local currency government bonds—were subject to abrupt sell-offs. Such actions not only exacerbate exchange rate volatility but may also impair the effectiveness of domestic monetary policy transmission by disrupting the sovereign bond market.

In Figure 6, we focus on the sample period from January 2008 to December 2014 and sort observations by the level of the VIX index to examine the pattern of yield volatility across different bond maturities. The results reveal a clear pattern: interest rate volatility tends to be higher during periods of elevated global risk, as proxied by the VIX. This finding suggests that global risk sentiment exerts a significant spillover effect on Chinese Taipei's LCGB market.

Figure 6: Interest Rate Volatility

Source: CBCT and Bloomberg.

6. Regulatory and Policy Responses

Chinese Taipei first introduced a regulatory cap on foreign investment in 1995, restricting foreign investors from allocating more than 30% of their remitted funds to domestic bonds and other short-term financial instruments. This restriction, however, was lifted in 1996, as market liberalisation progressed. In 2008, following a sharp increase in foreign participation in the government bond market, the Financial Supervisory Commission (FSC)—established in 2004 as the unified financial regulator—reinstated the 30% cap to strengthen oversight and prevent excessive speculative flows. Since then, the specific provisions of this regulation have been revised multiple times to reflect evolving market conditions and financial development. The key adjustments include:

- **March 2008**: Government Bonds with maturities under one year were included in the 30% cap.
- **November 2010**: The cap was extended to include government bonds of all maturities.
- **2015–2022**: Adjustments were made to include or exempt certain corporate bonds and financial derivatives.

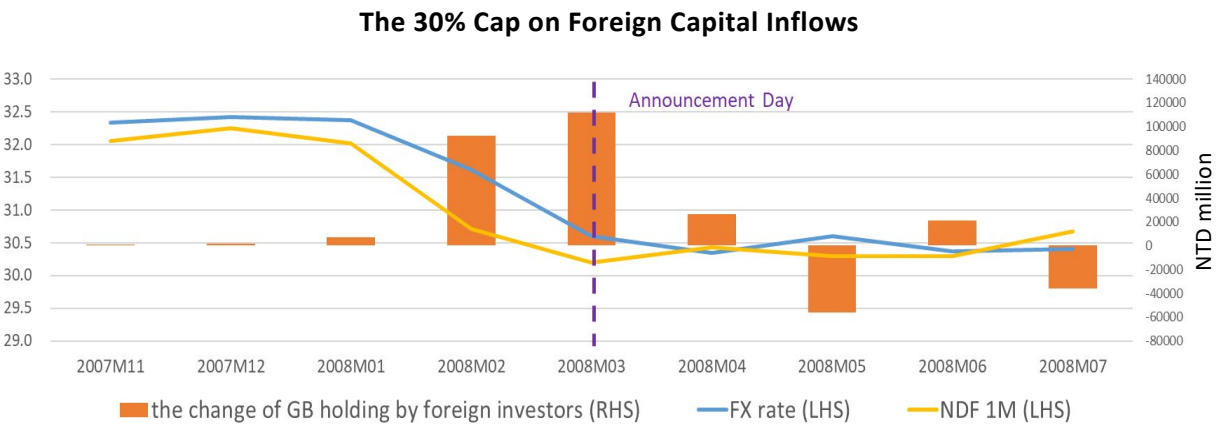
These evolving regulations illustrate Chinese Taipei's continuous effort to balance financial openness with market stability, ensuring effective monitoring of foreign capital movements while adapting to new financial instruments.

6.1 Event Studies: Policy Announcement

To further assess the effectiveness of policy adjustments, this study conducts two event analyses focusing on the relationship between net foreign holdings of government bonds and the 1-month expected exchange rate, proxied by the NDF rate, before and after specific regulatory announcements.

The first episode centres on the policy introduced on March 4, 2008, which restricted foreign investors from allocating more than 30% of their net inward remitted funds into government bonds with a remaining maturity of less than one year. As shown in the data, there was a significant gap between the spot exchange rate and the NDF rate prior to the policy, indicating strong expectations of NT dollar appreciation among foreign investors. This was accompanied by a net increase in foreign holdings of short-term government bonds, suggesting that investors were using these instruments to take advantage of anticipated currency gains.

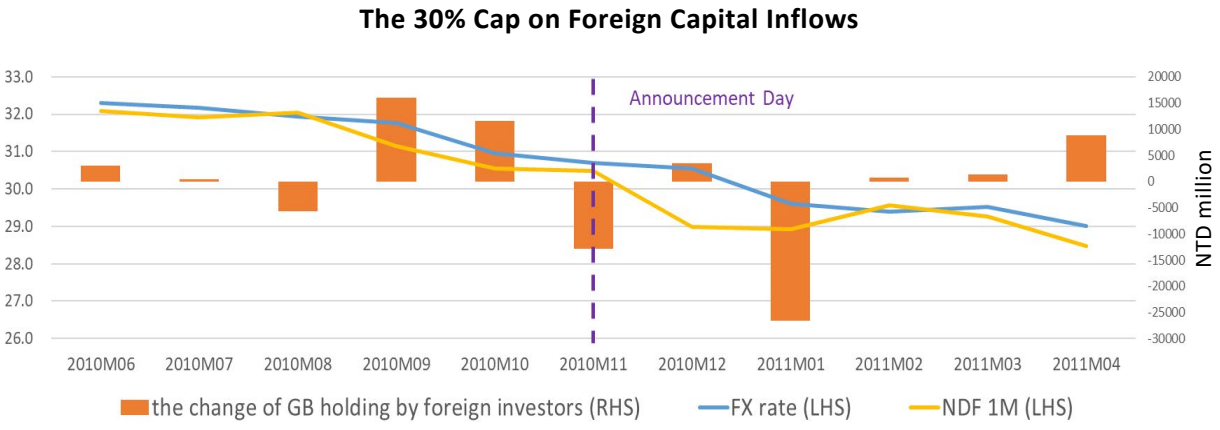
Figure 7: Net Foreign Holding Before and After 2008 Policy Announcement



Source: CBCT and Bloomberg.

The second episode occurred in late 2010, during a period of intensified capital inflows into emerging markets driven by quantitative easing (QE) policies in advanced economies. In the fourth quarter of 2010, the rapid appreciation of the NTD and a surge in foreign investment once again pushed foreign holdings in Chinese Taipei's financial markets above 5% of total outstanding government bonds. In response, on November 11, 2010, the FSC reinstated and expanded the 30% cap to include all maturities of government bonds. Although the NDF rate continued to reflect expectations of currency appreciation following the announcement, the pattern of foreign investors using the government bond market as a temporary parking vehicle for speculative capital gradually diminished.

Figure 8: Net Foreign Holding Before and After 2010 Policy Announcement



Source: CBCT and Bloomberg.

Importantly, the policy allowed investors whose holdings exceeded the cap at the time of implementation to retain their positions until maturity, thereby preventing immediate forced selling and avoiding large-scale capital outflows.

Empirical evidence from both the 2008 and 2010 episodes suggests that these targeted macroprudential measures were effective in mitigating the destabilising effects of volatile capital inflows. The regulations helped reduce short-term speculative activities while preserving overall market openness and stability in Chinese Taipei's financial system.

7. Conclusion

Chinese Taipei's experience with foreign investor participation in its LCGB market illustrates the dual-edged nature of capital market openness. While foreign inflows can deepen markets and improve liquidity, speculative and short-term behaviours—particularly those driven by exchange rate expectations—pose risks to financial stability.

Empirical analysis suggests that foreign investment is weakly responsive to traditional macroeconomic drivers, and is more sensitive to currency-related expectations. The resulting exchange rate and interest rate volatility necessitate vigilant policy responses. Chinese Taipei's managed exchange rate regime and targeted capital control measures have played an important role in mitigating these risks.

As short-term capital movements continue to increase globally, Chinese Taipei must remain proactive in monitoring investor behaviour, adjusting regulatory tools, and maintaining the delicate balance between openness and stability. This is essential not only for effective monetary policy transmission, but also for safeguarding the broader competitiveness of the economy.

References

Ahmed, S., Coulibaly, B., & Zlate, A. (2017). International financial spillovers to emerging market economies: How important are economic fundamentals? *Journal of International Money and Finance*. Vol. 76. September. pp. 133–152.

Arslanalp, S., Eichengreen, B., and Shin, H. S. (2020). Benchmark-driven investments in emerging market bond markets: Taking stock, IMF Working Paper No. 20/192, International Monetary Fund.

Ho, T.-K., & Yeh, K.-C. (2014). The impact of capital inflows on asset prices: Empirical evidence from Taiwan. Quarterly Bulletin of the Central Bank of the Republic of China (Chinese Taipei), 36(1), 3–40.

Hofmann, Boris, Ilhyock Shim and Hyun Song Shin. (2020). Emerging market economy exchange rates and local currency bond markets amid the Covid-19 pandemic. BIS Bulletin 7 April 2020.

International Monetary Fund. (2020). Global financial stability report: Markets in the time of COVID-19, October, Washington, D.C.: International Monetary Fund.

Yang, C.-L. (楊金龍). (2019, September), Strategic considerations on the use of capital in Taiwan. Central Bank of the Republic of China (Chinese Taipei) Quarterly. 41(3).

Appendix

The pairwise correlations among the external variables are relatively low, suggesting that multi-collinearity is not a concern in the regression specifications.

Appendix Table 1: The Correlations among the External Variables

	Δ VIX	Δ US 10y yields	Δ Global CPI ex. Oil
Δ VIX	1		
Δ US 10y yields	0.0366	1	
Δ Global CPI ex. Oil	0.1182	0.1597	1

We conduct pairwise correlation analysis among the domestic variables. The results in Appendix Table 2 indicate that the correlation between the import price index and the export price index is relatively high, at 0.8728, which can be attributed to Chinese Taipei's high dependence on international trade. Additionally, the FX appreciation rate exhibits moderate correlations with several other variables—including the import and export price indices, foreign exchange reserves, and TAIEX returns—with coefficients ranging from approximately 0.45 to 0.47.

To address potential multi-collinearity concerns, we conduct two robustness checks by excluding the Import Price Index and the FX appreciation rate, respectively, from the regression model. The results of these robustness tests in Appendix Table 3 confirm that the exclusion of these variables does not materially alter the main findings, indicating that multi-collinearity is unlikely to bias the baseline results.

Appendix Table 2: The Correlations Among the Domestic Variables

	Δ Import Price Index	**Δ Export Price Index**	**Δ CPI season adj.**	**Δ FX reserves**	**1M FX appre. rate**	**1M NDF**	**TAIEX return**
Δ Import Price Index	1						
Δ Export Price Index	**0.8728**	1					
Δ CPI season adj.	0.3936	0.3594	1				
Δ FX reserves percentage	0.3292	0.2410	0.0210	1			
1M FX appreciation rate	**0.4641**	**0.4533**	0.1317	**0.4636**	1		
1M USD/TWD NDF	-0.2516	-0.2424	-0.0845	-0.2366	-0.3789	1	
TAIEX return	0.3649	0.3437	0.1290	0.3412	**0.4793**	-0.1541	1

Appendix Table 3: Regression Results on Sensitivity to Domestic Factors

	Period: 2003/1~2024/12		Period: 2003/1~2024/12	
	Coeff.	Std	Coeff.	Std
Δ Import Price Index				
Δ Export Price Index	0.0001	0.0003	0.0305	0.0249
Δ CPI season adj.	0.0006	0.0008	0.0568	0.0833
Δ FX reserves percentage	0.1313 ***	0.0264	14.8864 ***	2.5374
1M FX appreciation rate	0.0554 *	0.0252		
1M USD/TWD NDF	-0.0120 ***	0.0029	-1.3641 ***	0.2794
TAIEX return	-0.0023	0.0056	0.1508	0.5318
Constant	-0.0013 ***	0.0003	-0.1530 ***	0.0292
R Square	0.2877		0.2743	
Adj-R Square	0.2711		0.2602	
F-statistic	17.30		19.50	
Observation	264		264	

*Note: *, **, *** indicate a significance level of 5%, 1% and 0.5%.*

Chapter 7

INDONESIA, GLOBAL RISK AVERSION, AND THE IMPACT OF FOREIGN INVESTOR TRADING ON LOCAL-CURRENCY GOVERNMENT BOND MARKETS[1]

By

Atsuyoshi Morozumi and **Arif Sulistiono**[2]

1. Introduction

Building on the proposition from Chapter 2 that an increase in the degree of global risk aversion generally increases foreign investors' net sales of EME LC government bonds, this chapter studies a closely related question. Namely, we now examine how an increase in net sales by foreign investors under a high-risk aversion circumstance may, in turn, destabilise the markets by affecting the bond prices and thus interest rates. Put differently, this chapter discusses the *effects* of foreign investor trading, rather than the *drivers*. By doing this, we aim to shed further light on the mechanism behind the international spillover effects of global shocks to LC government bond markets of emerging SEACEN economies.

Regarding why foreign investors' trading behaviour may impact EME LC interest rates, one argument is simply that to the extent that global shocks affect foreign investors' participation and thus their demand for LC bonds, the bond prices and thus yields may be affected. However, another argument, which is particularly relevant during global stress periods, is about possible *fire sales* of LC bonds by foreign investors. Here, the key type of investor that is worth highlighting is (open-end) mutual funds (IMF, 2022). While they allow end (ultimate) investors to add or redeem investments on any day at the current net asset value, they typically invest in assets that take more than one day to sell without a significant price discount, namely, fire sale price. The bottom line is that mutual funds are typically subject to liquidity mismatch where their liabilities are more liquid than assets.

1. The views expressed herein are those of the authors and should not be attributed to the Ministry of Finance, Indonesia.

2. Ministry of Finance, Indonesia.

Acknowledging this intrinsic feature of foreign mutual funds, suppose that the degree of global risk aversion has suddenly increased due to an adverse financial shock. Such occurrence of market stress, in turn, may induce an increase in redemptions by end investors and thus outflows from funds. Then, to the extent that mutual funds are subject to liquidity mismatch, fund managers may have to respond by selling assets at fire sales price (Morris et al., 2017; Shek et al., 2018; Bush et al., 2021). As a result, asset prices of less liquid assets, likely including EME government bonds, may be depressed, thereby increasing the yields. Given that there has been a substantial rise of international mutual funds' total net assets over the last two decades, this mechanism can potentially have an important impact on EME government bond yields during market stress periods.

Having developed the hypothesis, this chapter examines the impact of foreign investor trading on interest rates of EME LC government bonds by paying close attention to (1) the level of global risk aversion (to separate market stress from normal periods) and (2) the type of foreign investor (to isolate the role of mutual funds who are typically subject to liquidity mismatch). To do this, we consider the case of Indonesia, utilising daily data on foreign mutual funds' net purchases of long-term Indonesian Rupiah (IDR) bonds from 2 January 2008 to 28 December 2024.

We test the hypothesis in the following two ways. First, we examine how a correlation between foreign investors' net purchases of long-term IDR bonds and a change in the long-term yields of the bonds differs depending on the level of global risk aversion. Results show that higher net *sales* of the bonds by foreign mutual funds are strongly associated with a greater increase in the yields particularly under a high global risk aversion environment. Meanwhile, such a distinct role of global risk aversion is not observed when looking at different types of foreign investor, namely foreign commercial banks, and insurance companies and pension funds.

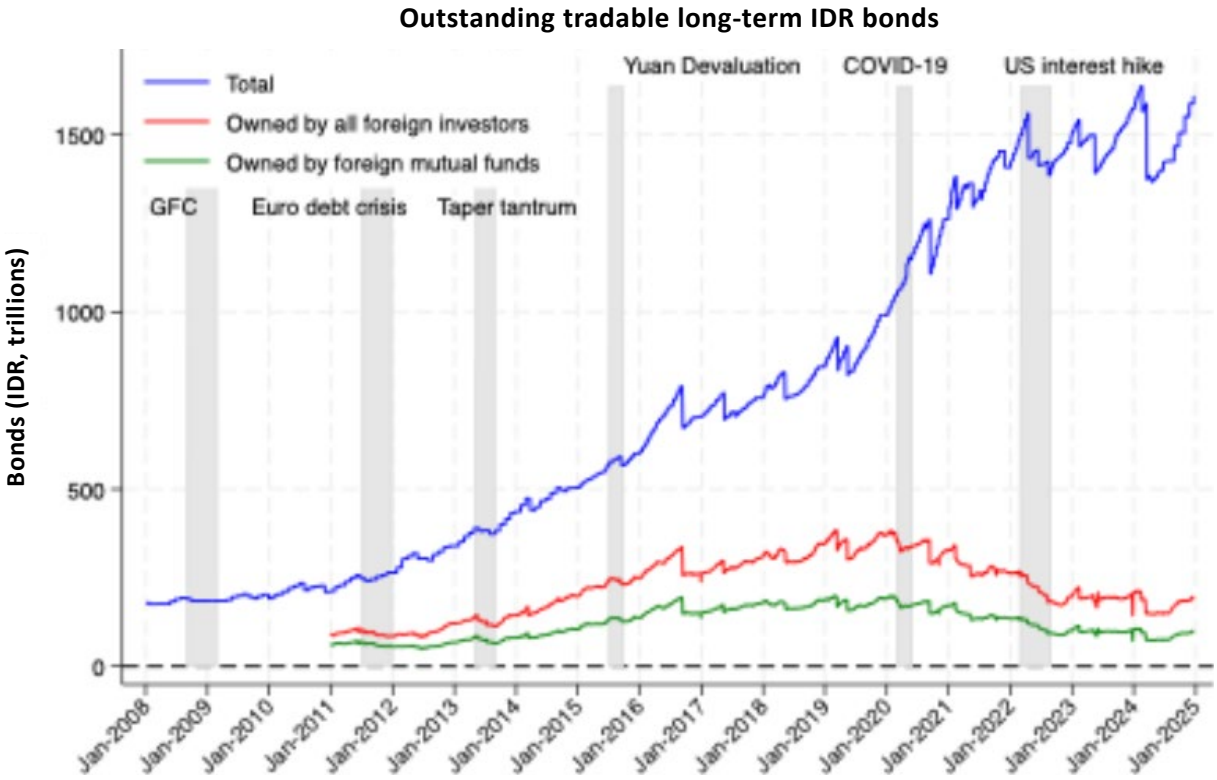
Second, more formally, we use a local projection method of Jordà (2005) to study the dynamic responses of the long-term IDR bond yields to the net purchases across different levels of risk aversion. We find that foreign mutual funds' net sales of long-term IDR bonds lead to a more significant, persistent increase in the bond yields under a high global risk aversion environment than a low risk one. Again, such a distinct role of the level of global risk aversion is not observed when repeating the exercise for the other types of foreign investor. Overall, there is support for the hypothesis that foreign mutual fund trading plays a distinct role in destabilising EME LC government bond markets when global risk aversion is high.

2. Background

2.1 Evolution of Foreign Holdings (Stock)

As some background information for the analysis, the blue line of Figure 1 shows the daily evolution of outstanding tradeable long-term IDR government bonds from 2 January 2008 to 27 December 2024. Here, "long-term" government bonds are bonds that have maturity of greater than ten years. In the same figure, the red line represents the holdings held by foreign investors, while the green line is the part of holdings held specifically by foreign mutual funds. While the foreign investors' (and mutual funds') shares fell particularly after the COVID-19 induced financial crisis of March 2020, their presence has still been solid over the subsequent few years.

Figure 1: Outstanding Tradable Long-term IDR Bonds and Foreign Investor Holdings

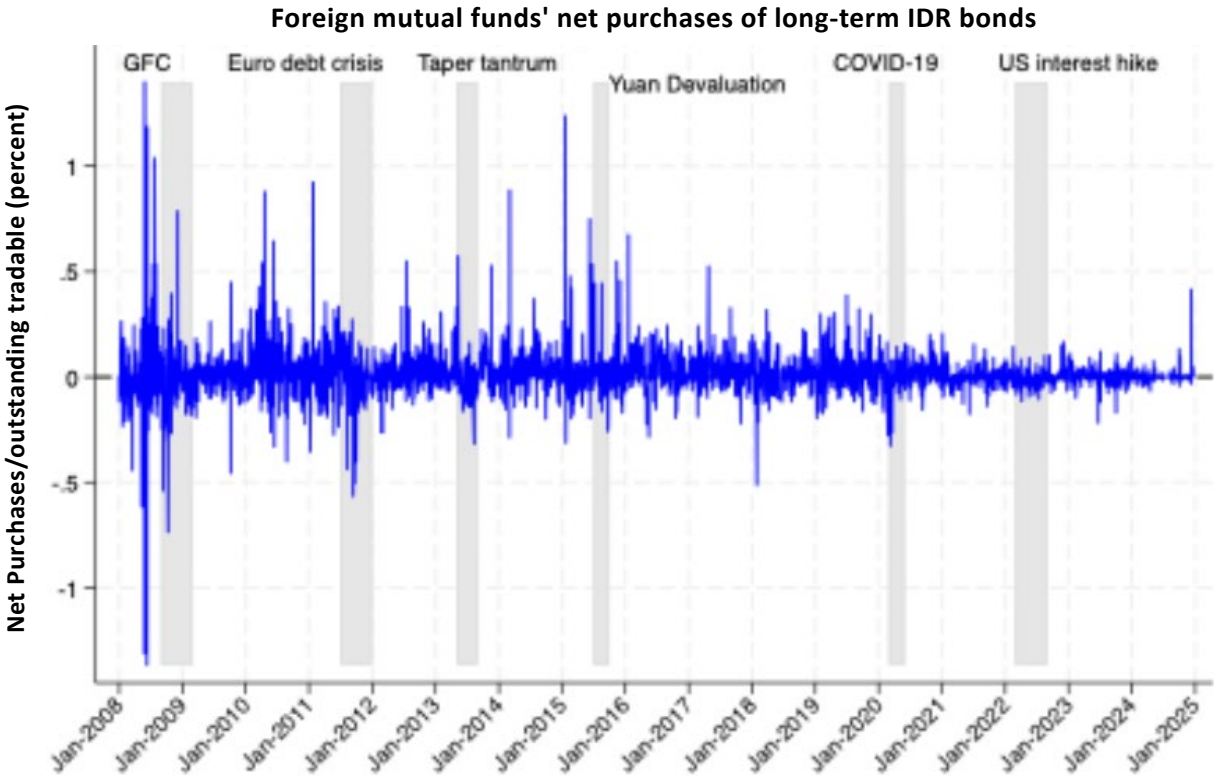


2.2 Net Purchases by Mutual Funds (Flow)

Turning to net purchases of IDR government bonds, the data are based on the transaction record by the universe of individual investors in the secondary market that has been assembled originally for Morozumi et al. (2024). The dataset allows us to categorise foreign investors' buying and selling activities by their types at the daily frequency. Net purchases are calculated as gross purchases minus gross sales.

Figure 2 describes the evolution of daily net purchases of long-term IDR bonds by foreign mutual funds. The net purchase variable here is scaled by the initial outstanding tradable IDR bonds, multiplied by 100 and thus expressed in percent. Shortly before and during the height of the Global Financial Crisis of 2008 Q4 and 2009 Q1, there was a substantial daily transaction of IDR bonds by foreign mutual funds, with the maximum net purchase ratio exceeding 1% (in an absolute value). While the net purchase ratio tends to be relatively smaller in other stress periods due to the rapidly growing outstanding tradable bonds (see blue line in Figure 1), some noticeable decreases in the ratio, namely net *sales* relative to the outstanding amount, are observed, e.g., during the European debt crisis and COVID-19 financial stress periods.

Figure 2: Foreign Mutual Funds' Net Purchases of Long-term IDR Bonds

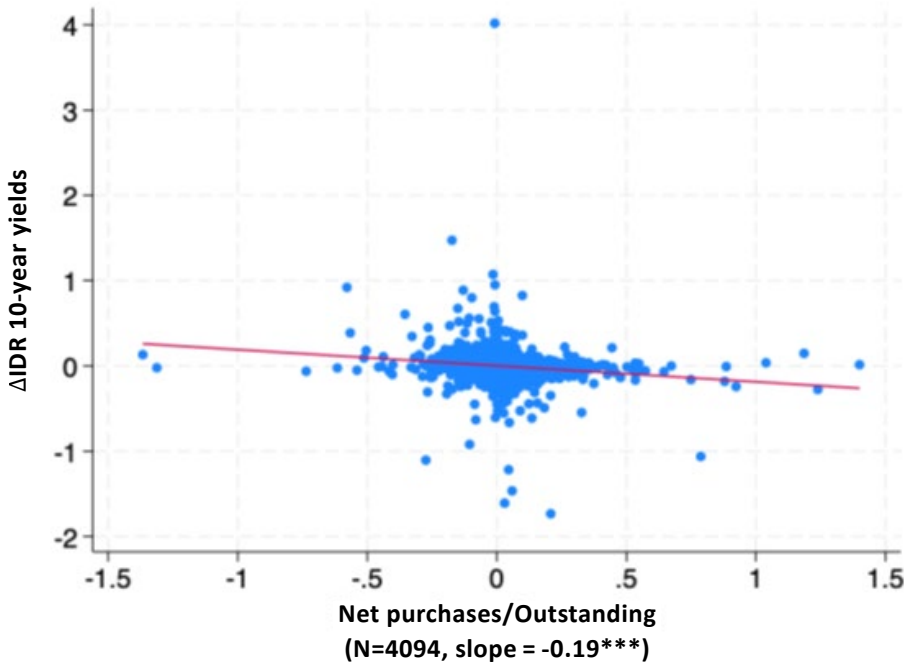


3. Net Purchases, Interest Rates and Global Risk Aversion

Here, we provide stylised facts about the relationship between foreign mutual funds' net purchases of long-term IDR government bonds and the long-term (10-year) interest rates using the daily data over the period between January 2008 and December 2024.

First, Figure 3 indicates that an increase in net *sales*, scaled by the outstanding tradable bonds, is positively associated with a change in the yields (i.e., negatively associated with a change in the bond prices). The association is significant at the 1% level. However, our conjecture is that the association is particularly strong when global risk aversion is high, because fund managers who typically face liquidity mismatch may be forced to sell the bonds at fire sales price amid end investors' demand for redemption.

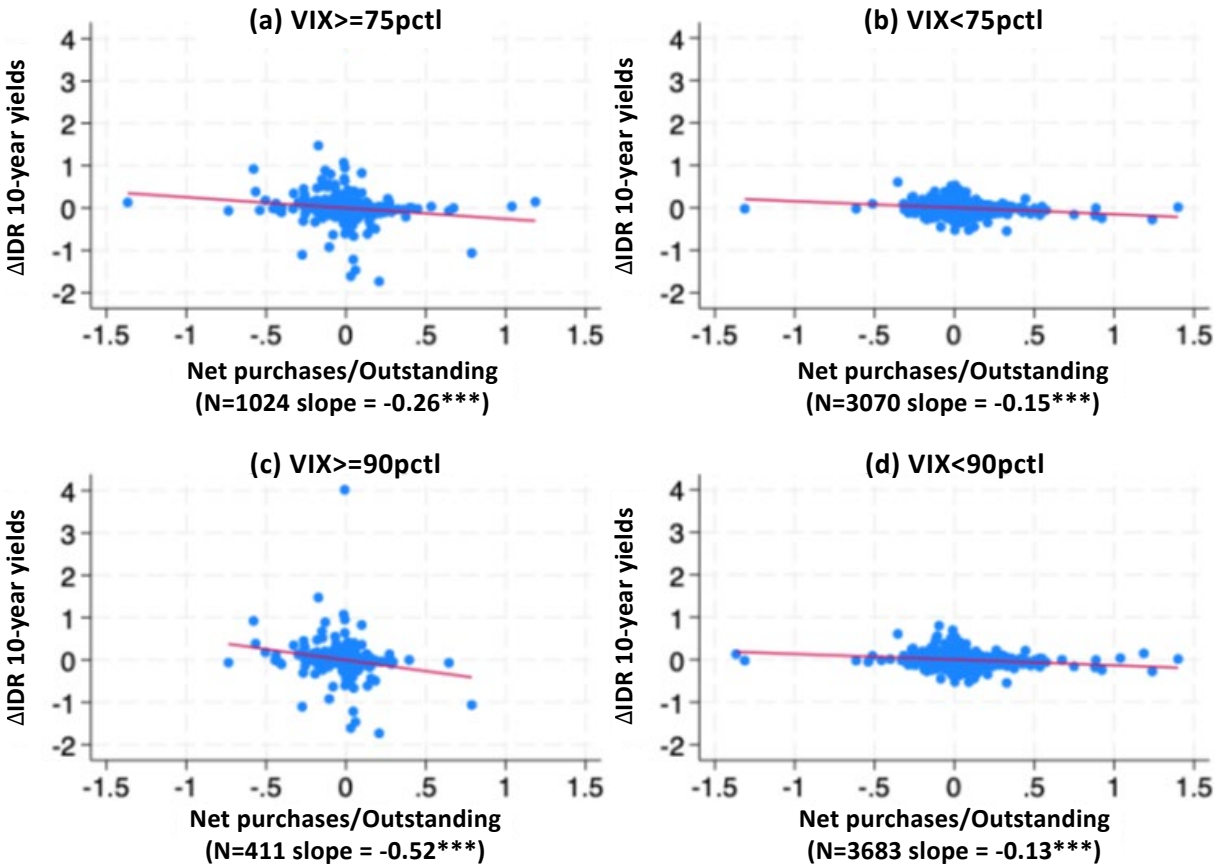
Figure 3: Net Purchases by Foreign Mutual Funds and Interest Rates



Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Hence, Figure 4 examines the association conditional on the level of global risk aversion proxied by the VIX index. Sub-figure (a) examines the correlation when the level of the VIX index is higher than the 75th percentile, while sub-figure (b) shows the correlation when it is below the threshold. Consistent with expectation, the coefficient is much larger (in absolute value) when the VIX index is relatively greater. A similar observation can be made when we use the 90th percentile of the VIX index as an alternative threshold. Moreover, the slope coefficient in sub-figure (c) where the VIX index exceeds the 90th percentile *doubles* relative to the coefficient in sub-figure (a) where the VIX exceeds the 75th percentile. This suggests the possibility of severe fire sale behaviour by fund managers when global risk aversion is particularly high.

Figure 4: Foreign Mutual Funds' Net Purchases and Interest Rates: Role of Global Risk



Next, Figure 5 conducts the same exercise focusing instead on foreign commercial banks' net purchases. When the VIX index is below the threshold, corresponding to a non-stress period, the slope is still negative (see sub-figures (b) and (d)), but when it is above the threshold, the association becomes insignificant, or even positive albeit only at the 10% level (sub-figures (a) and (c)). Figure 6 repeats the exercise for foreign insurance companies and pension funds which are considered to have long investment horizons. The variability of their net purchase ratios is small, suggesting that their trading pattern is stable compared to the other types of foreign investor. Still, we can make a similar observation as foreign commercial banks.

Overall, the take-away message here is that only for foreign mutual funds, a type of investors who are institutionally subject to liquidity mismatch, we observe a strongly significant positive association between the net sales of long-term IDR bonds and a change in the yields under a high global risk aversion environment.

Figure 5: Net Purchases by Foreign Banks and Interest Rates

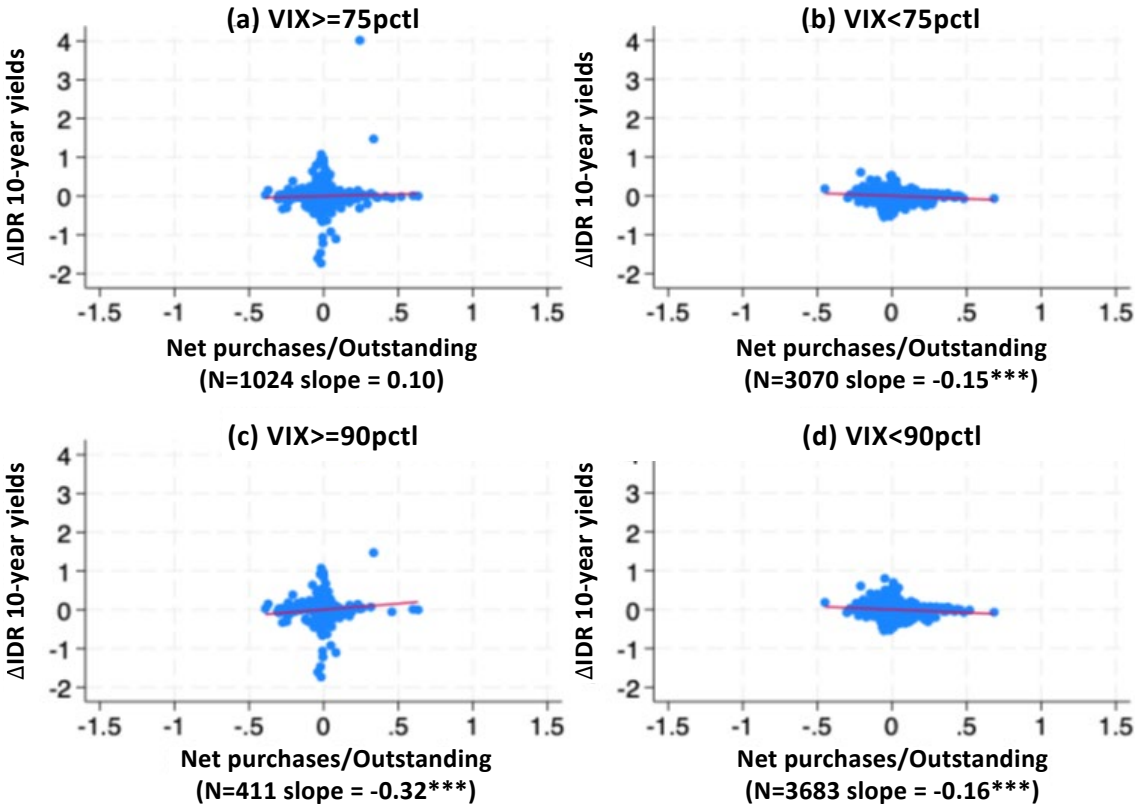
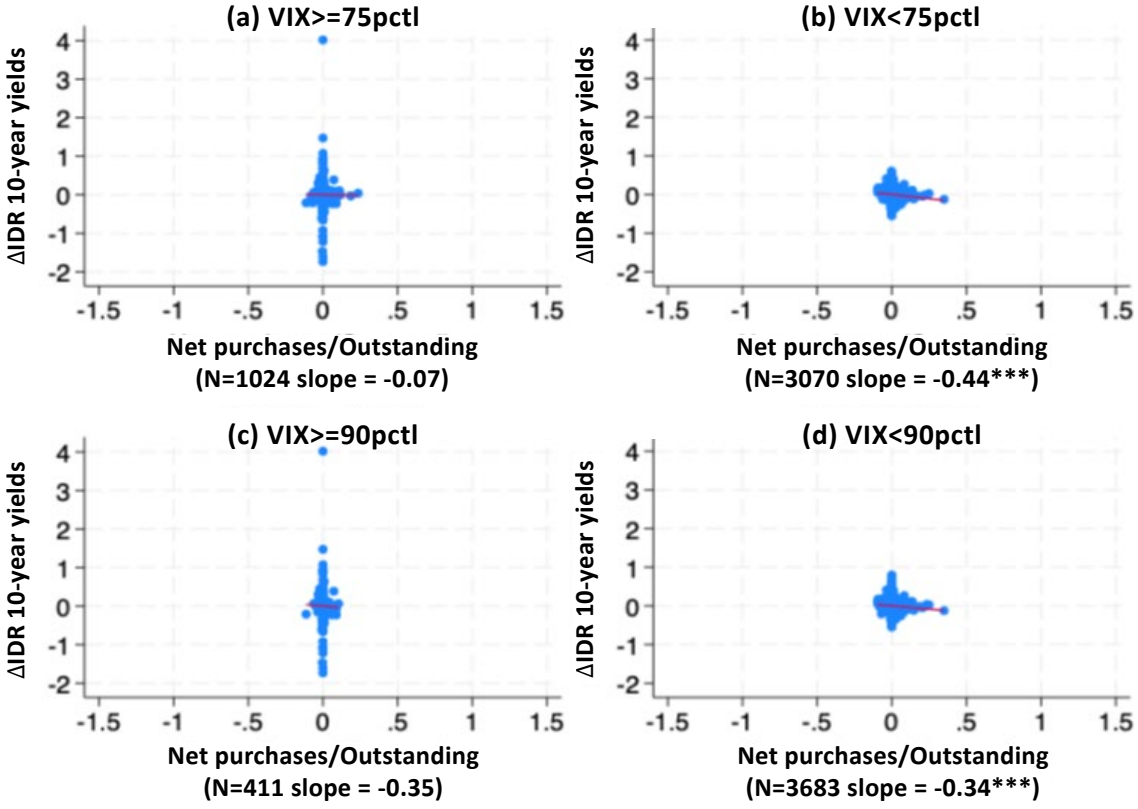


Figure 6: Net Purchases by Insurance Companies and Pension Funds and Interest Rates



4. Analysis Using Local Projection Method

4.1 Model

Taking a more formal approach, this section estimates the impulse response functions in the local projection method (Jordà, 2005). This method, forecasting future values of a variable using a horizon-specific regression, has the advantage of not imposing linear restrictions and thus more amenable to considering state-dependence. This feature is particularly suitable to consider the relevance of the level of global risk aversion to the effects of foreign investor trading on the LC (IDR here) government bond market stability. Specifically, we estimate a series of regressions for investor type g at each horizon h:

$$\Delta Y_{t+h} = \alpha_h^g + \beta_h^g np_t^g + \delta_h^g(L) controls_{t-1}^g + \varepsilon_{t+h}^g \quad (1),$$

where ΔY_{t+h} is a change in long-term (10-year) IDR bond yields over the horizon h from day t to $t+h$ for h=0,1,2,.... On the right-hand side, np_t^g is the net purchase ratio, defined as net purchases of long-term IDR government bonds by foreign investors of type g, scaled by the outstanding tradable bonds and multiplied by 100. β_h^g thus captures the response of interest rates at horizon h to net purchases by foreign investors of the type. $\delta_h^g(L)$ is the lag operator on a set of controls. In what follows, we consider 5 lags of a change in yields and expected depreciation rates (against USD) as controls.

Further, to consider the role of the level of global risk aversion in the effects of foreign investor trading on the IDR bond yields, we extend the model as follows:

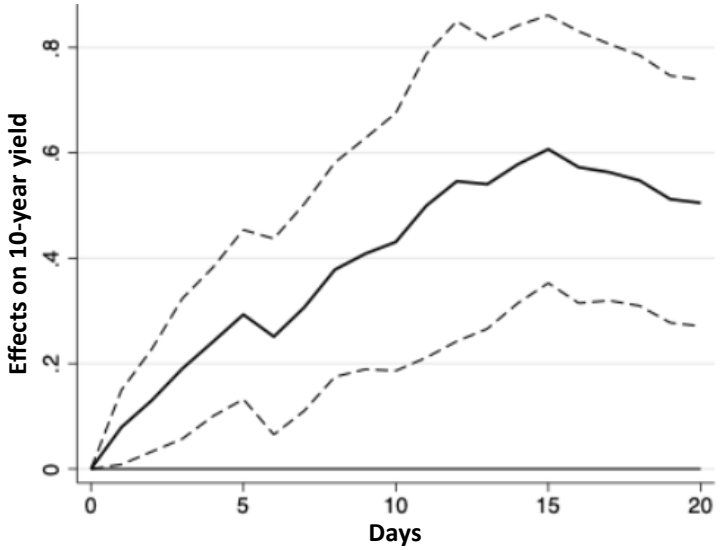
$$\begin{aligned}\Delta Y_{t+h} = {} & I_{t-1}\left[\alpha_{A,h}^g + \beta_{A,h}^g np_t^g + \delta_{A,h}^g(L) control_{t-1}^g\right] \\ & + (1 - I_{t-1})\left[\alpha_{B,h}^g + \beta_{B,h}^g np_t^g + \delta_{B,h}^g(L) control_{t-1}^g\right] + \varepsilon_{t+h}^g \quad (2)\end{aligned}$$

On the right-hand side, the variable I takes the value of one when global risk aversion is high and 0 otherwise. As in the scatter plot exercise above (Figures 4 to 6), we consider the 75th and 90th percentiles of the VIX index as a cut-off value. Hence, our focus here is to compare $\beta_{A,h}^g$ and $\beta_{B,h}^g$, and obtain an insight on how the effects of net purchases of long-term IDR government bonds on the long-term yields may differ depending on the level of global risk aversion.

4.2 Results

Figure 7, estimating Eq. (1), presents results on the unconditional effects of foreign mutual fund trading on long-term IDR government bond yields. In the figures below, we convert net purchases into net sales (by multiplying by -1) for graphical convenience. The dotted lines represent 95% confidence interval. The figure suggests that foreign mutual funds' net sales of the long-term IDR bonds persistently increase the yields over the next 20 working days.

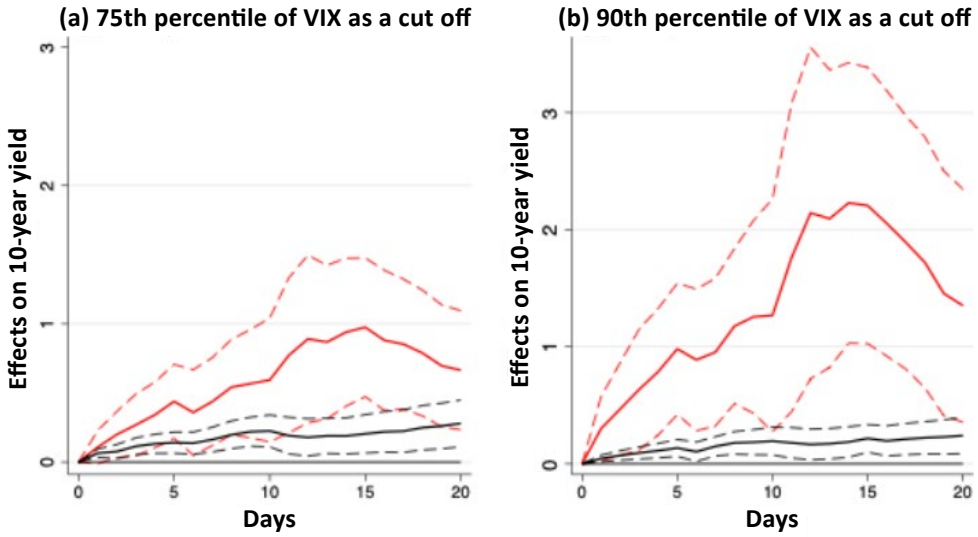
Figure 7: Dynamic Effects of Foreign Mutual Funds' Net Sales on Interest Rates



Note: Dashed line represents a 95% confidence interval.

Figure 8 estimating Eq. (2), highlights how the effects of the net sales differ depending on the levels of the VIX index. Sub-figures (a) and (b) use the 75th and 90th percentiles as thresholds, respectively. Both sub-figures indicate that the effects are greater when the VIX index is high, i.e., when global risk aversion is high. Moreover, when the VIX index is particularly high, being above the 90th percentile, the coefficients are significantly greater over most of the time horizon. They reach 2 after about 10 working days, indicating that an increase in the net purchase ratio by 0.1 percentage points is associated with a 0.2 percentage point increase in the yields over the duration.

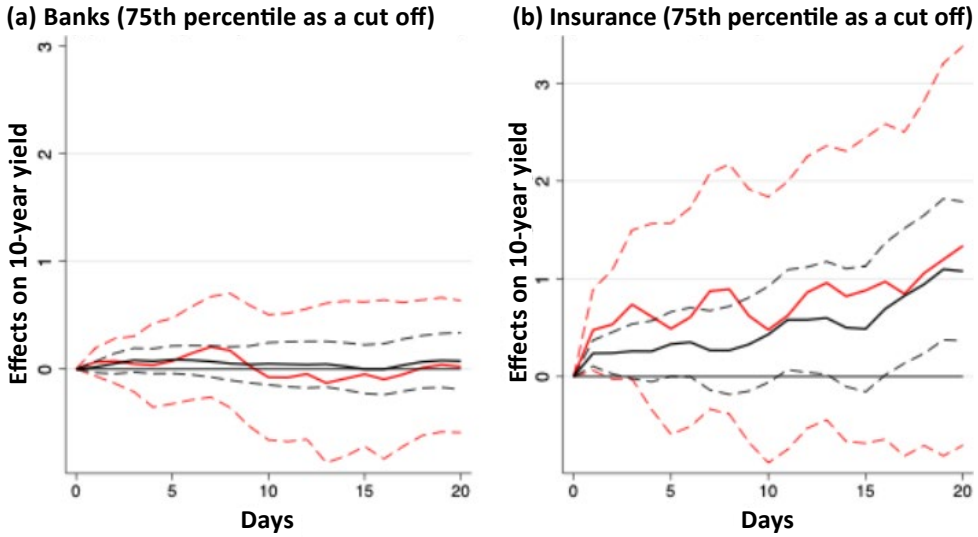
Figure 8: Dynamic Effects of Foreign Mutual Funds' Net Sales on Interest Rates: Role of Global Risk Aversion



Notes: Red (black) line represents the response when global risk is high (low).
Dashed line represents a 95% confidence interval.

Lastly, Figure 9 repeats the same exercise for net sales by foreign commercial banks (sub-figure (a)) and insurance companies and pension funds (sub-figure (b)), using the 75th percentile of the VIX index as a cut off. The results suggest that for those types of foreign investors, net sales barely have a significant impact on long-term IDR bond yields, regardless of the level of global risk aversion. Overall, the indication is that foreign mutual funds play a distinct role in the international spillover effect of global shocks on IDR government bond markets, in that their net sales have a particularly strong positive impact on the yields under a high global risk aversion environment.

Figure 9: Dynamic Effects of Net Sales by Foreign Commercial Banks, and Insurance Companies and Pension Funds, on Interest Rates: Role of Global Risk Aversion



Notes: Red (black) line represents the response when global risk is high (low). Dashed line represents a 95% confidence interval.

5. Concluding Remarks

This chapter examines, using Indonesia as a case study, the effects of foreign investor trading on yields of the long-term LC (IDR) bonds. The results suggest that foreign mutual funds' trading, in particular, has a strong impact on yields when global risk aversion is high. Importantly, this is consistent with the key feature of mutual funds, i.e., liquidity mismatch. The results help deepen our understanding of how global shocks may be transmitted to LC government bond markets of SEACEN economies.

References

Bush, G., C. Cañon, & D. Gray. (2021). Emerging market capital flows: The role of fund manager portfolio allocation. Working Paper No. 2021-13, Banco de México.

IMF. (2022). Global financial stability report: Navigating the high-inflation environment. International Monetary Fund, Washington, DC, October.

Jordà, Ò. (2005). Estimation and Inference Of Impulse Responses By Local Projection. *American Economic Review*, 95, 161–182.

Morozumi, A., M. Bleaney, & A. Sulistiono. (2024). Types of foreign investor and local-currency bond markets in emerging economies. Mimeo. School of Economics. Nottingham University.

Morris, S., I. Shim, & H. S. Shin. (2017). Redemption risk and cash hoarding by asset managers. *Journal of Monetary Economics*, 89, 71–87.

Shek, J., I. Shim, & H. S. Shin. (2018). Investor redemptions and fund manager sales of emerging market bonds: How are they related?. *Review of Finance*, 207–241.

Chapter 8

FOREIGN INVESTORS AS A TRANSMISSION CHANNEL OF EXTERNAL SHOCKS: AN INVESTIGATION OF THE ASEAN LOCAL CURRENCY SOVEREIGN BOND MARKET

By

Pham Thi Tuyet Trinh[a], Trieu Kim Lanh[b], Duong Thi Thuy An[c], and Dang Thi Quynh Anh[d]

1. Introduction

After the global financial crisis (GFC), foreign investors' holding of domestic bonds in emerging markets increased significantly (Ebeke & Lu, 2015; IMF, 2012). Global (exogenous) factors are increasingly seen as determinants that have a significant influence on borrowing costs in emerging markets (González-Rozada & Yeyati, 2008). Therefore, local currency bond yields are also more influenced by external macroeconomic shocks that affect the behaviour of foreign investors in the local currency bond market (LCBM). When global risk appetite is low, domestic bond yields are mainly influenced by inflation and real GDP growth expectations, suggesting that the market focuses more on risk stemming from sensitivity to domestic macroeconomic shocks in a normal development period. However, when global risk appetite is high, creditors' concerns about default risk are the leading factor, and expectations about fiscal deficits and government debt play an essential role in determining domestic government bond yields (Jaramillo & Weber, 2013b, 2013a). Therefore, economies with low levels of financial integration, current account deficits, and trade openness will be less susceptible to external shocks than countries with high levels of financial integration and trade openness. Besides, global liquidity is also a factor of greater concern with global risk aversion that will affect investors' decisions to invest abroad and thus will affect their trade-off between risk and return (Jaramillo & Weber, 2013b).

Since the COVID-19 pandemic, emerging markets have faced increasing global shocks and macroeconomic instability, making the deployment of proactive monetary policies and foreign exchange-related measures to strengthen economic resilience more necessary than ever. Furthermore, global monetary policy synchronisation could lead to more spillovers to emerging markets. On the one hand, greater policy alignment would stabilise yield spreads between advanced and emerging markets. On the other hand, it

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could also increase the sensitivity of bond yields in emerging markets to bond yields in advanced economies (IMF, 2024). To better clarify the level of spillover effects of global shocks through the behaviour of foreign investors in the local currency bond markets in the ASEAN region, this research will attempt to answer the question "What is the role of foreign investors in the domestic bond market in the ASEAN region in the face of external shocks?" with case studies of 5 ASEAN economies including Vietnam.

This paper employs a two-equation panel framework to investigate how external shocks are transmitted to ASEAN local-currency sovereign bond markets via foreign investor behaviour. The first equation models the quarterly share of local government bonds held by foreign investors (FHR) as a function of global factors—U.S. T-bill rate (USR) and VIX—and domestic macro conditions—inflation, exchange rate, local policy interest rate, and a COVID-19 dummy. The second equation links the bond market condition, proxied by the 5-year government bond yield (LCBM), to the same covariates plus FHR. Using data from five ASEAN economies during 2019 Q1 to 2024 Q3, we estimate long-run relationships via Fully Modified Ordinary Least Squares (FMOLS) and Dynamic Ordinary Least Squares (DOLS), with robustness checks and a VECM-based Granger causality analysis to capture short-run dynamics.

The main findings are as follows. First, we find that foreign investors' holdings in ASEAN local-currency government bonds decline significantly in response to higher U.S. 3-month Treasury rates and increased global equity-market volatility, while domestic currency depreciation similarly deters foreign participation but higher local inflation slightly attracts it; the COVID-19 period exerts a pronounced negative effect on cross-border bond flows. Second, in the long-run, elevated foreign holdings compress the 5-year local government bond yield, whereas adverse shocks—including higher U.S. rates, greater volatility, elevated domestic inflation, and the pandemic—widen the yield. Third, short-run dynamics reveal that quarterly fluctuations in ASEAN bond yields are driven chiefly by changes in U.S. rates, global uncertainty, and local monetary policy actions, with foreign investors' portfolio adjustments occurring more gradually.

The rest of the report is structured as follows. Section 2 reviews related studies on the drivers of domestic bond yields in emerging markets, case study countries, and spillovers from global shocks affecting foreign investors participating in domestic bond markets in emerging economies. Section 3 provides the research model and estimation strategy, while Section 4 provides estimation results. Section 5 presents the main conclusions and policy implications.

2. Literature Review

2.1 Related Studies

De Leo et al. (2025) study the relationship between bond yields and exchange rates in emerging and advanced economies and their correlation with foreign investor participation in LCBM. The study then incorporates these correlated flows into a portfolio balance model together with short-term interest rate risk. The equilibrium model explains the coupling of bond yields and exchange rates, the pattern of trading positions and returns in bond and foreign exchange markets, the effects of quantitative easing, and the differences between advanced and emerging economies. Using data from 2006M1 to 2021M12 and evaluating the Columbia LCBM, the results find that lower bond maturity premiums are accompanied by lower currency premiums in emerging economies. Results from the equilibrium model show that foreign investors shape the equilibrium dynamics for the foreign exchange market. Foreign investors participating in the LCBM will also have a corresponding cash flow entering the spot foreign exchange market (not the forward market). Besides, a change in exchange rate policy can affect the net supply of government bonds and foreign currencies because it is provided by local financial intermediaries (for example, quantitative easing policy will reduce the supply of bonds).

Berensmann et al., (2015) discuss the role of LCBMs in financing the long-term sustainable development of economies in sub-Saharan Africa (SSA) and provide an empirical analysis of the factors that may hinder or promote the development of these markets. The results show that the development of LCBM is associated with country size, a larger banking system, a higher level of trade openness, a better legal framework, and a strong rule of law.

Miyajima et al., (2015) assess the role of LCBM in emerging countries during the period 2000 - 2011. First, the study examines domestic and external factors affecting the yields of government bonds in LCBM of emerging countries in a static panel framework. Second, the study tests whether these yields are resilient to shocks in the second half of 2000 in a dynamic panel VAR model. The results show that domestic factors – especially monetary and fiscal policy – played a relatively more important role than global factors, such as US bond yields and VIX (the implied volatility of the S&P 500 stock index), in determining local currency bond yields in EMEs over the past decade. And these bond yields are quite resilient to both domestic and global shocks. US Treasury yields are an important factor in determining domestic currency bond yields of emerging countries, especially during the global monetary easing cycle.

Jaramillo & Weber (2013b) analyse the determinants of domestic bond yields in emerging markets and their vulnerability to global shocks in 26 emerging economies throughout 2007M3–2013M7. The paper shows that domestic bond yields in emerging economies are heavily influenced by two international factors: global risk appetite and global liquidity. Using a new approach, the analysis further shows that the vulnerability

of emerging economies to these factors is not uniform but depends on country-specific characteristics, specifically fiscal fundamentals, financial sector openness, and external current account balances.

Jaramillo & Weber (2013a) evaluate the influence of fiscal variables on domestic bond yields in emerging economies depending on the level of global risk aversion, with 26 emerging economies in the period 2005 - 2011. The results show that when global risk aversion is low, domestic bond yields are mainly affected by inflation and real GDP growth expectations. This suggests that, in normal times, markets focus more on risks stemming from sensitivity to macroeconomic shocks. As global risk aversion increases, investors are more concerned about defaults, so bond yields are likely to rise.

González-Rozada & Yeyati (2008) study the extent to which changes in bond yield spreads in developed countries explain the change in bond yield spreads in emerging markets between 1994 and 2005. The article shows that a large part of the change in emerging market bond spreads is explained by the development of global factors such as risk appetite (reflected in high-yield corporate bond spreads in developed markets), global liquidity (as measured by international interest rates) and contagion (from systemic events such as Russia's default). The results highlight the important role of exogenous factors in the evolution of borrowing costs faced by emerging economies.

Morozumi et al. (2023) examine the role of foreign investors in the propagation of global shocks to LCBMs in emerging economies according to the heterogeneous behaviour of each type of investor. The analysis takes two steps: First, the study analyses the weekly net buying behaviour of different types of foreign investors. Second, it studies whether net selling by foreign investors destabilises IDR bond yields/prices. Weekly data from 2011 to 2021 for Indonesia show that when global risk aversion increases, foreign mutual funds respond by increasing their sales of Indonesian Rupiah (IDR) bonds, which depreciates the IDR price against the US dollar and increases yields (i.e., depreciates IDR bond prices) as mutual funds are subjected to redemption demand from end-user investors, forcing them to sell bonds at a discount. Foreign commercial banks further sell IDR bonds in response to falling prices and exchange rate depreciation, amplifying bond market volatility. Foreign insurance companies and pension funds do not appear to contribute to the propagation of shocks to global risk aversion.

Beirne et al. (2024) examine the role of LCBMs and the participation of foreign investors in capital flow fluctuations in emerging Asian economies during the period 1999 - 2020. The results show that economies with less developed LCBMs are more susceptible to capital flow fluctuations due to the participation of foreign investors in these markets. Furthermore, foreign investors in the LCBMs will react more quickly to changes in global interest rates than domestic investors. From the perspective of financial stability, the study encourages reducing dependence on foreign investors, prioritising the mobilisation of long-term capital to finance investment and sustainable development from domestic

resources through LCBM. Additionally, greater efforts are needed to strengthen foreign exchange hedging arrangements for foreign investors in the LCBM, especially during times of heightened financial stress.

Wang et al. (2023) evaluate the impact of foreign investors' participation on the price fluctuations of two types of Chinese bonds, government bonds, and policy bank bonds, as well as in three stages in the liberalisation of the Chinese bond market. With daily data from January 8, 2002, to June 30, 2022, for the GARCH and TGARCH models and an assessment divided into periods before foreign participation and after foreign participation in China's LCBM, the study finds that foreign participation does not have a significant impact on the volatility of the domestic bond market. Additionally, the study finds that those bonds are more affected by government policies. From a policy perspective, the results of the study highlight the importance of increasing the openness of China's domestic currency bond market, stabilising foreign investors' expectations, and international capital flows.

Ho (2022) examines the impact of foreign participation on local currency government bond (LCGB) market yield spreads in emerging Asian countries. The research shows that the impact of high foreign participation on market stability is non-monotonic: During periods of stability, high foreign participation reduces yield spreads. However, in times of market distress, high foreign participation asymmetrically exacerbates the increase in yield spreads to a larger size, possibly due to currency risk. The results highlight the importance of expanding the domestic investor base in the region and maintaining manageable exchange rate expectations and central bank credibility.

Fonay (2022) determines the impact of foreign investment in the local bond markets of seven Latin American economies from 2004 to 2021. The results show that the presence of foreign investors tends to reduce the yield spread of bonds denominated in local currencies. However, it has also been seen that in harsh and volatile times, having some of this debt in the hands of international holders can widen yield spreads.

Ebeke & Lu (2015) analyse the influence of foreign investors on the level and volatility of LCGB yields in emerging markets with data for the period 2004Q2 – 2013Q2 of 13 emerging markets and a case study of Poland. The results show that the participation of foreign investors in government bond markets in emerging countries in local currencies has an impact on the level and volatility of bond yields (in reducing the level and increasing the volatility of bond yields). LCGB yields rise as global risk aversion increases. Research also shows that in countries with strong macroeconomic fundamentals and healthy debt levels, an increase in foreign holdings can reduce bond yields (lower borrowing costs).

Meanwhile, in Vietnam, research by Le et al. (2015) shows the impact of macroeconomic policies affecting the flow of foreign indirect investment (FPI) into Vietnam in the period 2005 - 2012. The results show that GDP and inflation have opposite impacts on FPI, while exchange rates, money supply, and interest rates are not statistically significant on FPI. This is a sign that the level of efficiency in receiving foreign investment capital in Vietnam in the period 2005 - 2012 is not high.

Tran (2018) uses a set of indicators to assess the level of financial integration to evaluate the level of integration of the Vietnamese bond market according to the quantity index and infrastructure index. Accordingly, as of December 2017, in terms of volume, the proportion of foreign investors holding domestic government bonds is still low compared to some countries in the ASEAN region (6.3% - 8.3% in the period 2015 - 2017). The number of bond issuances for the international market in Vietnam is not many (3 times), with the issuance value being quite small compared to the total value of government bonds issued. Asian investors had a holding rate of about 38% (in 2010), and the rate decreased to 28% (in 2014), but the proportion of American investors has gradually increased.

Le & Nguyen (2024) examine the external shock through the global economic policy uncertainty index GEPU (Global Economic Policy Uncertainty) to the risk of stock price collapse in the Vietnamese stock market. The results show that the impact is in the same direction, and stocks with a large trading scale have a stronger impact, demonstrating the level of disagreement in the reactions of both domestic and foreign investors. However, in Vietnam, the proportion of individual investors is very high (more than 90%) in the total number of stock investors, while the research does not go beyond investors' reactions to the stock market.

2.2 Summary of Related Studies and Research Gaps

Before 2000, domestic bond markets in many emerging Asian countries were still in the nascent stage of development. Therefore, the mismatch in terms and mismatch in currencies has made the level of risk tolerance when a financial crisis occurs for countries quite low (HKMA, 2020; Park, 2016)

After the 2000s, in light of the lessons learned from the Asian financial crisis (AFC) in 1997 - 1998, the size of the domestic bond market increased many times, and the importance of attracting foreign investors into the domestic bond market in emerging countries became increasingly clear. Studies focusing on examining the spillover effects of global shocks and global liquidity that change the behaviour of foreign investors in the domestic bond market are increasingly receiving more attention. Research (De Leo et al., 2025) shows that foreign investors play quite an important role in shaping the equilibrium dynamics of the domestic foreign exchange markets of emerging economies. Therefore, changes in exchange rate policy and the management of the domestic foreign exchange

market will also impact the domestic long-term debt market for countries with significant participation of foreign investors. Volatility in the domestic bond market may be different for countries with different developments in the LCBMs, specifically countries with less developed LCBMs are more susceptible to capital flow fluctuations due to the participation of foreign investors in this market. When there is an external shock, foreign investors will react faster, making financial stability in these LCBMs less sustainable (Beirne et al., 2024; Berensmann et al., 2015). However, in China, the level of impact of foreign investors on Chinese LCBM is insignificant due to the degree of domestic debt market openness (Wang et al., 2023).

Meanwhile, in Indonesia, external shocks spread to the domestic bond market through foreign investors expressed through global risk aversion. When global risk aversion increases, domestic bond yields will increase due to a decrease in bond prices, and the exchange rate between domestic and foreign currencies (especially USD) will also be affected due to the devaluation of the domestic currency. This spillover is observed in foreign mutual funds and foreign banks, while foreign insurance companies and pension funds do not appear to contribute to the propagation of shocks to global risk aversion (Morozumi et al., 2023). This is similar to the research results of (Ebeke & Lu, 2015) for 13 emerging economies and a case study of Poland for the period 2004 - 2013.

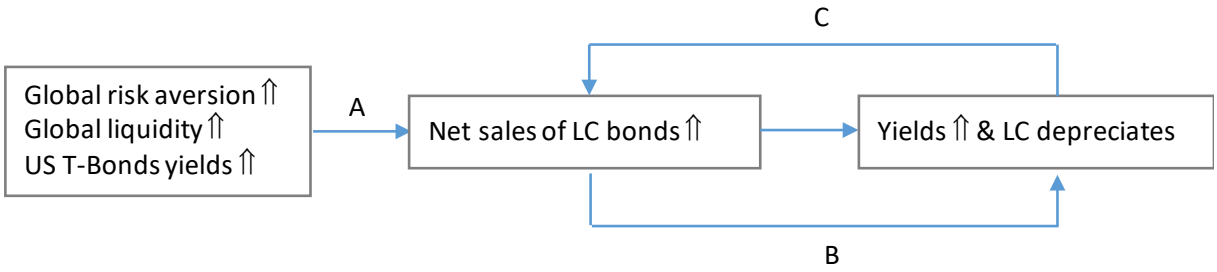
The level of yield spreads in the domestic bond market that can be affected by foreign investors varies depending on external macroeconomic conditions. During periods of stability, the participation of foreign investors can help reduce spreads. However, during difficult market times, foreign investor participation can exacerbate the increase in bond yield spreads (Fonay, 2022; Ho, 2022). The influence on spreads can also be due to global factors such as risk appetite and liquidity (González-Rozada & Yeyati, 2008), in addition to internal national factors such as inflation and economic growth (Jaramillo & Weber, 2013a; Uribe & Yue, 2003). Sometimes, external shocks cause foreign investors to change their behaviour in the domestic bond market, the extent of this impact varies from country to country depending on the fiscal policy, openness of the financial sector, and the external current account balance of those countries (Jaramillo & Weber, 2013b; Miyajima et al., 2015).

In general, foreign investors are more sensitive than domestic investors to external shocks; they react faster which can exacerbate fluctuations in the domestic bond market in times of crisis or instability. However, under normal conditions, the presence of foreign investors can reduce interest rate differentials, contributing to shaping the balance of the domestic bond market, because they contribute to foreign exchange cash flows and ensure more market stability. From an Asian country perspective, case studies in China and Indonesia show similar results. So, how will foreign investors in ASEAN bond markets react to external shocks? This is the motivation for our research.

2.3 Related Theories

The extent of spillover effects from external shocks on the behaviour of foreign investors affecting the domestic bond market according to (González-Rozada & Yeyati, 2008; Morozumi et al., 2023) is described in Figure 1.

Figure 1: Spreading External Shocks to Foreign Investors Affects the Local Currency Bond Market



Source: (González-Rozada & Yeyati, 2008; Morozumi et al., 2023).

Figure 1 describes the transmission of external shocks affecting different types of foreign investors, thereby influencing their behaviour in the domestic bond market.

Arrow A: When global risk aversion increases (e.g., due to the COVID-19 pandemic), foreign investors (e.g., foreign mutual funds) increase the selling of domestic bonds. Or, as US Treasury bond yields rise, bond sales by foreign investors also increase significantly.

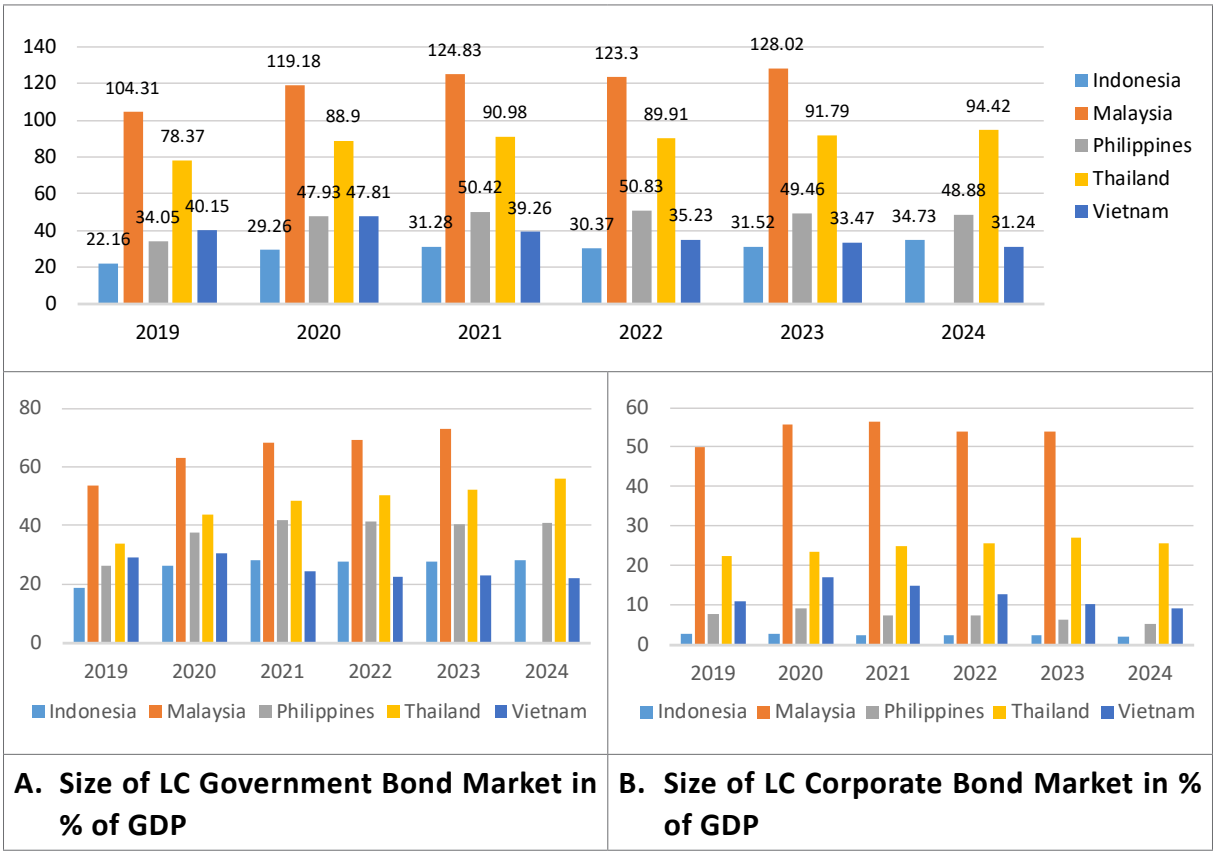
Arrow B: increased net sales of bonds simultaneously decrease the price of the domestic currency relative to the USD and increase the domestic bond yields (decreased bond prices) in week t.

Arrow C: Foreign investors (e.g., foreign banks) reacting to the depreciation of the local currency and falling bond prices in the previous week also increase the selling of domestic bonds in the current week, creating a feedback loop and amplifying the fluctuations in bond prices in the following week. Instability continues to persist.

2.4 A Brief Overview of the ASEAN-5 Bond Market and Foreign Investors Holdings

Indonesia, Malaysia, Philippines, Thailand, and Vietnam are small open economies and emerging markets in Southeast Asia. From Figure 2 which shows the size of local currency bond markets as a percentage of GDP, we can see that during 2019-2024, Malaysia and Thailand have the largest bond markets in the region, both in government (A) and corporate bonds (B). Indonesia and the Philippines have smaller markets, and their corporate bond segments (B) are quite limited in percent of GDP. Meanwhile, Vietnam's bond market is growing, especially in government bonds (A), but the corporate bond segment (B) remains small.

Figure 2: Size of the ASEAN-5 Local Currency Bond Market in % of GDP



A. Size of LC Government Bond Market in % of GDP

B. Size of LC Corporate Bond Market in % of GDP

Source: AsiaBondsOnline.

Figure 3 shows foreign holdings in ASEAN-5 local currency bond markets, including Indonesia, Malaysia, Philippines, Thailand, and Vietnam. You can see that from 2010 to 2019, foreign investor holdings increased. But in the period from 2019 to 2024, the percentage of foreign investor holdings declined, to approximately 20% or lower. Figure 4 shows the details for the same period of 2019–2024. Among the ASEAN-5, Indonesia has the highest percentage of foreign investor holdings, while Vietnam the lowest.

Figure 3: Foreign Holdings (% Total) in ASEAN-5's LCY Government Bonds

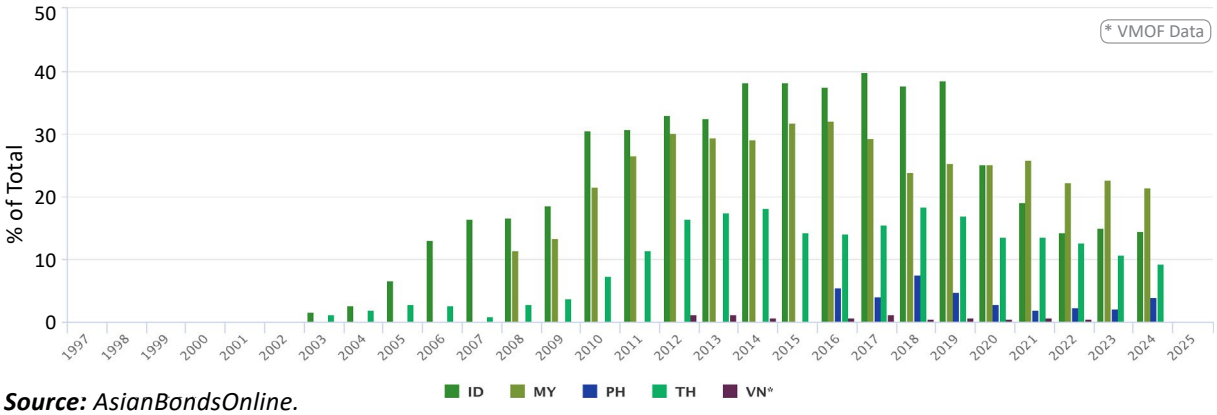


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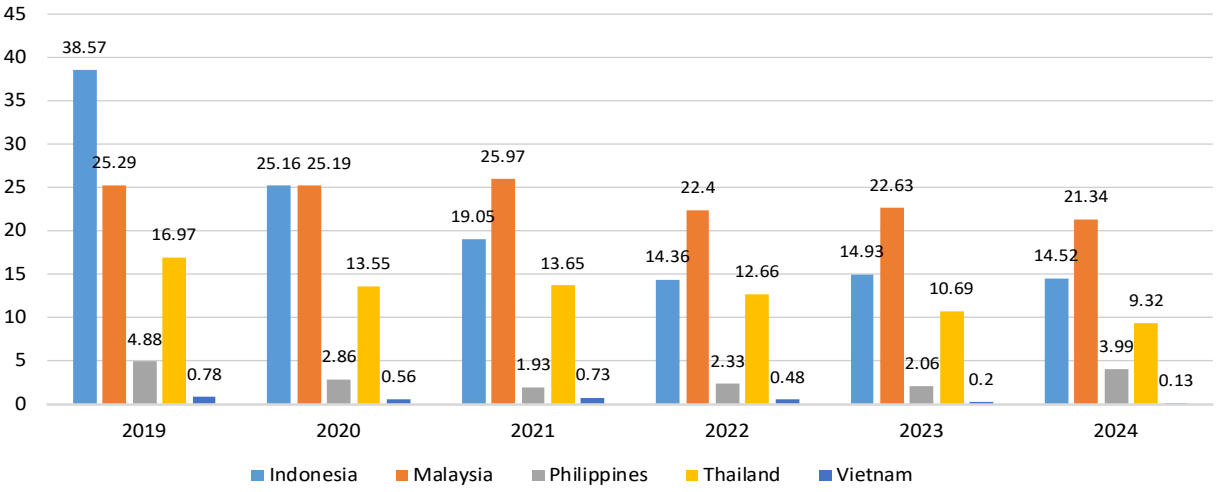
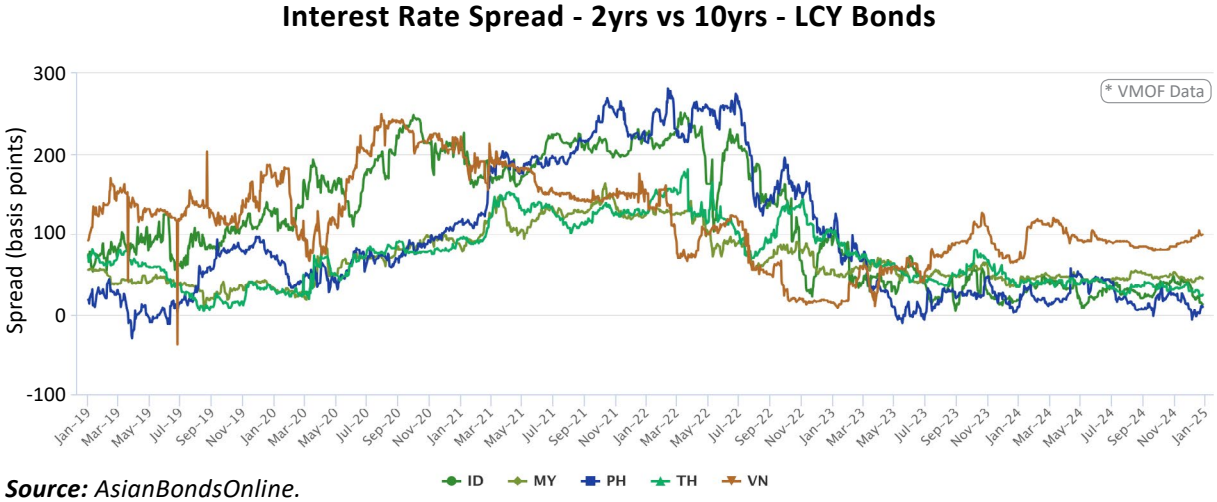
Figure 4: Foreign Holdings (% Total) in ASEAN-5's LCY Government Bonds 2019 - 202



Source: AsiaBondsOnline.

In terms of bond yields, a study by González-Rozada & Yeyati (2008) emphasise that global shocks now have a stronger influence on the cost of borrowing in emerging countries. Looking at the ASEAN-5 in Figure 5, we can see that during the period from 2019 to 2024, the interest rate spread fluctuated quite a lot - especially between 2019 and 2022. But in 2023 and 2024, it became more stable. This may reflect financial instability in the ASEAN-5 markets during times of global shocks.

Figure 5: Interest Rate Spread in the ASEAN-5 LCB Bond 2019 - 2024



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Overall, Malaysia has the most balanced bond market, while the others still rely mostly on government bonds. In terms of bond market size, Malaysia and Thailand are the largest. But when it comes to foreign investor holdings, Indonesia ranks the highest, followed by Malaysia.

3. Research Model and Estimation Strategy

This study investigates the role of foreign investors as a transmission channel of external shocks to the LCGB markets in five ASEAN economies. Specifically, it examines (i) the responsiveness of foreign investors to global shocks, and (ii) the impact of foreign holdings on local bond market conditions. To this end, we employ a panel econometric approach based on the following system of two equations. Equation (1) evaluates the extent to which external and domestic macroeconomic conditions affect foreign investors' holdings of LCB. Equation (2) estimates the impact of foreign investors' holdings on the local government bond market, controlling for external and domestic variables.

Research model

$$FHR_{i,t}=\alpha_0+\alpha_1 USR_t+\alpha_2 VIX_t+\alpha_3 INF_{i,t}+\alpha_4 EXR_{i,t}+\alpha_5 LPR_{i,t}+\alpha_6 LGBM_{i,t}+\alpha_7 C19_t+\varepsilon_{i,t} \quad (1)$$

$$LGBM_{i,t}=\beta_0+\beta_1 USR_t+\beta_2 VIX_t+\beta_3 INF_{i,t}+\beta_4 EXR_{i,t}+\beta_5 LPR_{i,t}+\beta_6 FHR_{i,t}+\beta_7 C19_t+u_{i,t} \quad (2)$$

Where $FHR_{i,t}$ is the share of local government bonds held by foreign investors in country i at time t; USR_t is the United States 3-month Treasury bill rate (percent per annum); VIX_t is the Chicago Board Options Exchange (CBOE) Volatility Index; $INF_{i,t}$ is the inflation rate of

country i at time t; $EXR_{i,t}$ is the logarithm of the average exchange rate (local currency per USD),$LPR_{i,t}$ is local policy interest rate (discount rate or similar); $LGBM_{i,t}$ is local government bond market condition, proxied by 5-year government bonds yield; $C19_t$ is the COVID-19 pandemic dummy variable (1 for 2020Q1–2021Q4; 0 otherwise),and $\varepsilon_{i,t}$, $u_{i,t}$ are the error terms. Equation (1) evaluates the extent to which external and domestic macroeconomic conditions affect foreign investors' holdings of LCB. Equation (2) estimates the impact of foreign investor's holding on the local government bond market, controlling for external and domestic variables. The study uses data from 5 ASEAN countries from the first quarter of 2019 to the third quarter of 2024 due to the availability of data. Table 1 summarises the description of variables and data sources.

Table 1: Description of Variables and Data Sources

Variable		Measures	Source
Foreign holdings	$FHR_{i,t}$	Debt Securities held by foreign investors x 100	AsianBondOnline
US T-bill rate	USR_t	1-Year Treasury Bill yield	Tradingview.com
Stock market volatility	VIX_t	CBOE Volatility Index	Tradingview.com
Domestic inflation	$INF_{i,t}$	Annual inflation rate	International financial statistics (IFS)
Exchange rate	$EXR_{i,t}$	The period average of national currency per US dollar in logarithm	
Local policy rate	$LPR_{i,t}$	Discount rate or monetary policy-related interest rate in percent per annum	
Local government bond market	$LCBM_{i,t}$	5-year local government bond yield	tradingview.com
COVID-19 pandemic	C19	1 for 2020Q1-2021Q4, 0 otherwise	Dummy variable

Source: Authors.

3.1 Estimation Strategy

Given the panel data structure and the time-series nature of the variables, we first test for stationarity to avoid spurious regression outcomes. We use two popular testing methods, including Breitung (2002) test and the Im et al. (2003) (IPS) test, to obtain consistent results. The optimal lag length is selected by the Schwarz Information Criterion (SIC).

Next, to ascertain the existence of a long-run equilibrium relationship among the variables in Equations (1) and (2), we conduct panel cointegration tests. Specifically, to ensure the reliability of the cointegration tests, the study uses the methodologies of Pedroni (2004a) and Kao (1999). Both tests are based on two-step residuals developed by Engle & Granger (1987) with the null hypothesis of no cointegration in the heterogeneous panel.

Furthermore, based on the result of the cointegration test, the long-run relationship between variables is estimated by using the FMOLS. We also employ DOLS as a robustness test. The FMOLS allows the estimation of cointegrating vectors of heterogeneous groups of mean variables. The main advantage of this method is that it corrects for both serial correlation bias and concurrent bias and evaluates differences between selection regions (Pedroni, 2004). Meanwhile, DOLS measures the prediction of a specific cointegrating vector in the system. However, DOLS requires uniformity among long-term coefficients.

Finally, when a long-run relationship is ascertained, a Granger causality test based on the vector error correction model (VECM) can be conducted following the procedure of Engle & Granger (1987) to explore the short-run relationship between variables.

4. Estimation Results and Discussions

4.1 Descriptive Characteristics of Variables

Table 2 shows the descriptive statistics of the variables. The holding share of foreign investors in ASEAN's government bond market (FHR) is 12.59% on average but diverse among countries. The lowest share is 0.15%, for Vietnam, and the largest share is 39.070%, for Indonesia. Figure 1 shows the variety of foreign investors' holdings for ASEAN government bonds. Compared to other countries, Vietnamese government bonds held by foreign investors were very limited between 2019 and 2024. Although Vietnam does not impose restrictions on the holding ratios of foreign investors, their limited holding ratios of Vietnamese government bonds suggest that the country's government bonds are less appealing. Additionally, during the study period, foreign investors' holding ratios in all local government bond markets were sharply declining, reflecting the widespread impact of the COVID-19 pandemic.

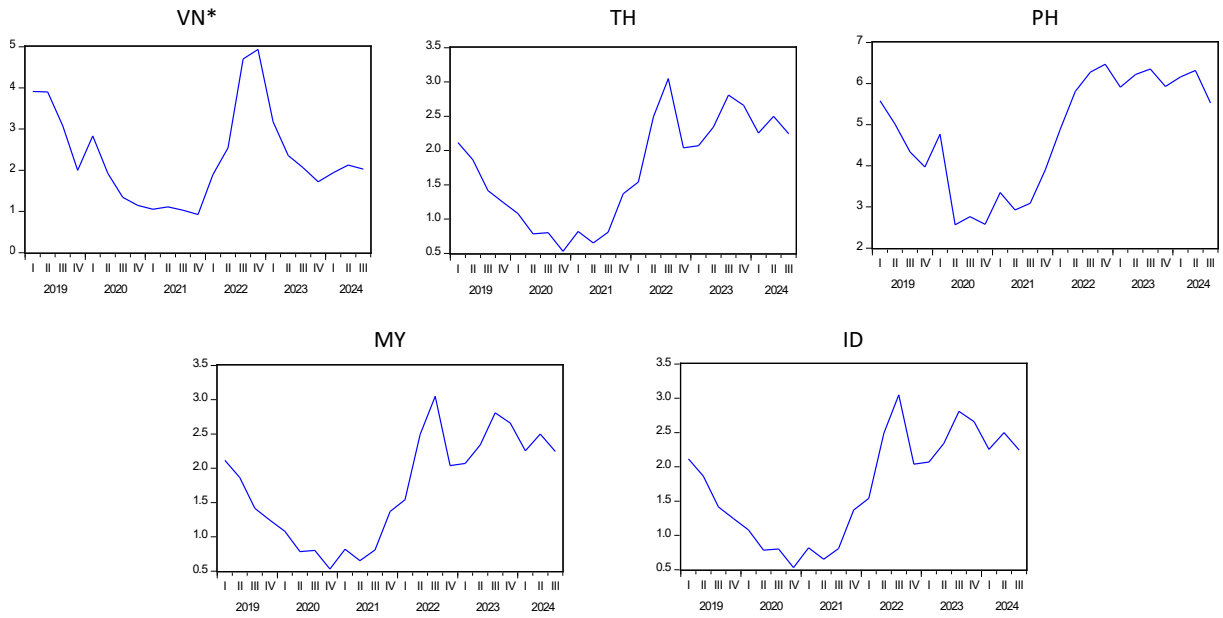
Tables 2: Descriptive Statistics of Variables

	FHR	LCBM	USR	VIX	INF	LPI	EXR	C19
Mean	12.590	2.459	2.422	20.788	2.610	3.578	5.577	0.348
Median	13.390	2.115	1.870	17.520	2.644	3.500	3.942	0.000
Maximum	39.070	6.470	5.190	53.540	8.304	6.500	10.095	1.000
Minimum	0.150	0.530	0.070	12.440	-2.666	1.000	1.402	0.000
Std. Dev.	10.603	1.560	1.987	8.943	2.008	1.640	3.486	0.478
Skewness	0.462	1.106	0.048	2.158	0.109	0.199	0.291	0.639
Kurtosis	2.318	3.467	1.331	8.294	3.550	1.937	1.353	1.408
Jarque-Bera	6.321	24.496	13.396	223.570	1.634	6.178	14.622	19.966
Observation	115	115	115	115	112	115	115	115

Source: Authors' calculation.

The bond yields across ASEAN countries experienced significant fluctuations during this period. Except for Vietnam, all countries showed a horizontal S-shaped fluctuation of yields. Government bond yields have increased dramatically since 2020 and remained high since 2020, reflecting the significant widespread impact of the COVID-19 pandemic. On the contrary, the US T-bill rate stayed low before 2022 and increased significantly afterwards. The movement of the US T-bill rate to a higher level reflected the move of investors from safe assets to high-return, high-risk assets after the pandemic. The expectation of global investors also fluctuated in this period, with a wide range from 12.44 to 53.54. The uncertainty climbed steeply when the pandemic broke out in late 2019, and remained high during this time, before getting lower after 2022.

Figure 6: The Fluctuations in ASEAN Government Bond Yields



4.2 Stationary Characteristics of Variables and Cointegration Tests

Table 3 summarises the results of unit root tests for variables. According to Breitung's test, USR, VIX, and INF are stationary at the level, while the others have a unit root. However, the null hypothesis of a unit root is not rejected for all variables at the level according to IPS's test. All variables are stationary in the first difference according to both tests. These results allow us to explore the cointegration relationship.

Table 3: The Results of Unit Root Tests

Variables	Breitung t-stat		IPS t-stat	
	At level	First difference	At level	First difference
FHR	1.238	-2.140**	1.451	-3.244***
LCBM	-1.396*	-5.083***	-0.012	-5.946***
USR	-2.252**	-3.895**	-0.691	-1.585*
VIX	-5.248***	-13.899***	-1.508	-10.748***
INF	-2.952***	-4.717***	-1.252	-3.734***
LPI	0.374	-2.941***	-0.406	-1.206*
EXR	-0.376	-2.472***	-0.179	-96.137***

****, **, * are significance levels at 1%, 5%, and 10%, respectively. Automatic lag length selection based on SIC*
Source: Authors' estimations.

Table 4 shows the results of the cointegration tests of equation (1) following the methodologies of Pedroni (2004a) and Kao (1999), respectively. Both panel statistics and group mean panel statistics according to Pedrodi's (2004) methodology suggest that the null hypothesis of no cointegration can be rejected regardless of the deterministic components included (intercept/ trend). Kao's (1999) methodology also confirms the long-term relationship between variables at the 1% significance level. Thus, the cointegration relationship between the system of variables in equation (1) does exist, allowing us to estimate the long-run relationship between foreign investors' holdings and the variables of external shocks and local macroeconomic conditions.

Table 4: The Results of Cointegration Tests

	No intercept or trend[a]		No deterministic trend[a]		Deterministic intercept and trend[a]	
Alternative hypothesis: common AR coefs (within-dimension)						
	Non-weighted	Weighted	Non-weighted	Weighted	Non-weighted	Weighted
Panel v-statistic	-1.210	-1.816	-1.411	-1.608	6.355***	-1.029
Panel rho-statistic	1.864	0.812	1.933	1.077	1.859	1.306
Panel PP-statistic	-0.756	-1.786*	-0.959*	-2.303**	-0.560	-4.516***
Panel ADF-statistic	-0.619	-1.630*	-0.339*	0.367**	-0.507	-1.938**
Alternative hypothesis: individual AR coefs. (between-dimension)						
Group rho-Statistics	1.930		2.173		2.559	
Group PP-statistic	-1.352*		-1.495*		-1.691***	
Group ADF-statistic	-1.425*		-0.8262		-0.555***	
Kao residual cointegration test (t-statistic)[c]	-1.545*					

****, **, * are significance levels at 1%, 5%, and 10%, respectively; Newey-West automatic bandwidth selection and Bartlett kernel.*

[a] *Automatic lag length selection based on SIC with lags from 2 to 3.*

Source: Authors' estimations.

4.3 The Response of Foreign Investors to International Shocks in the Long-run

The long-run estimation of equation (1) indicates the response of foreign investors in ASEAN government bond markets to a change in global financial conditions. The results of the estimations by FMOLS and DOLS are consistent in the sign and magnitude, implying the robustness of our models. There is a small difference in the estimations of VIX, which are statistically significant according to FMOLS but not statistically significant according to DOLS.

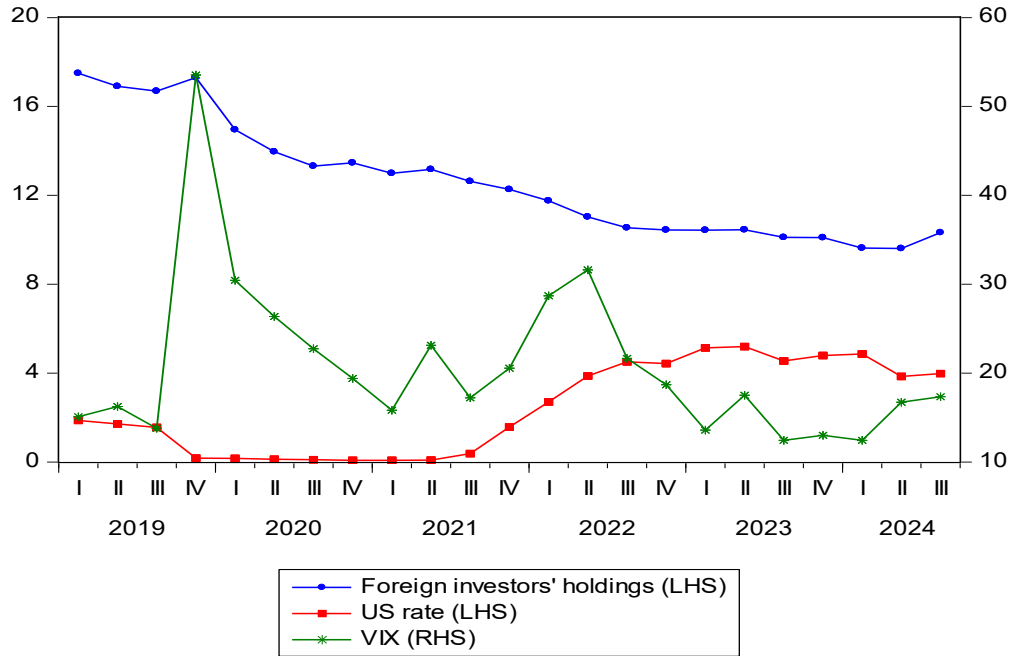
Table 5: The Estimation Result of Foreign Investors' Responsiveness

Variable	FMOLS	DOLS
USR	-2.138***	-2.063***
VIX	-0.027**	-0.025
INF	0.381***	0.345**
LPI	0.174	0.227
EXR	-7.080***	-7.450***
LCBM	1.090***	0.982**
C19	-3.347***	-3.173***
R-squared	0.910	0.923
Adjusted R-squared	0.889	0.915

****, **, * are significance levels at 1%, 5%, and 10%, respectively; Pooled weighted estimation; Bartlett kernel, Newey-West automatic bandwidth, NW automactic lag length.*
Source: Authors' estimations.

As expected, USR is statistically significantly negative, implying a reduction in foreign investors' holding of ASEAN government bonds when there is an increase in the US T-bill rate. This result reflects the sensitivity of foreign investors in the ASEAN government bond market to a change in other global bond markets. Similarly, VIX is negatively associated with foreign investors' holdings. When investors' expectation for uncertainty in the global market increases, they also decrease the holding of high-risk assets, including ASEAN government bonds. Thus, the decreasing attractiveness of ASEAN government bonds to foreign investors post the COVID-19 pandemic is driven by higher US interest rates and global uncertainty.

Figure 7: The Movements of Foreign Investors' Holding Ratios, US Rate and VIX



Source: Foreign investors' holdings: AsianBondOnline; US rate and VIX: Tradingview.com.

Table 5 also indicates that foreign investors' behaviour in ASEAN government bond markets is driven by macroeconomic conditions. Specifically, a depreciation of the local currency (an increase in the exchange rate) is negatively associated with the holding ratio of foreign investors. However, a higher inflation rate induces foreign investors to invest in local government bonds due to the higher nominal interest rate of the local bond yields. The worldwide health crisis also has a negative impact on the cross-border flow into ASEAN's government bond markets.

4.4 The Transmission Role of Foreign Investors in the Local Bond Market

The long-run estimation of equation (2) denotes the transmission role of foreign investors in ASEAN's government bond market. Table 6 summarises the consistent estimation results of Model 2 for both FMOLS and DOLS. A higher holding ratio of foreign investors in total outstanding local government bonds, implying their net purchases, causes their yield to decrease as expected. Although the holding share of foreign investors is small, their sales do cause fluctuations in the local market. This influence indicates the role of foreign investors in local bond markets. In addition, due to the sensitivity of foreign investors to external conditions as evidenced above, the foreign investors' behaviour also plays a role as a channel of external shocks to LCBM in the ASEAN region.

Table 6: The Impact of Foreign Investors on ASEAN's Government Bond Market

Variable	FMOLS	DOLS
USR	0.286***	0.302***
VIX	0.025*	0.036***
INF	0.204***	0.123**
LPI	0.671***	0.637***
EXR	-0.294***	-0.231***
FHR	-0.086***	-0.053***
C19	0.775**	0.656***
R-squared	0.550	0.749
Adjusted R-squared	0.523	0.735

****, **, * are significance levels at 1%, 5%, and 10%, respectively; Pooled weighted estimation; Bartlett Kernel, Newey-West automatic bandwidth selection, NW automatic lag length.*
Source: Authors' estimations.

Additionally, ASEAN's government bond market is also dependent on external and internal factors. Government bond yields in ASEAN countries increase following an increase in the domestic inflation rate, an appreciation of local currency, and a tightening of monetary conditions. Regarding the impact of external conditions, an increase in US interest rates and higher global uncertainty lead to higher yields of ASEAN government bonds as expected.

4.5 The Short-run Relationship in the Local Government Bond Market

Table 7 shows the results of the short-run granger causality test. Purchases by foreign investors causes neither an effect on the ASEAN bond market nor macroeconomic conditions of countries in the region. In return, foreign investors do not respond to changes in the US rate but are significantly sensitive to global risk and changes in the exchange rate of ASEAN currencies. The drivers that lead to fluctuations in the ASEAN bond market in the short-run are the US rate, global risk, and local monetary policy.

Table 7: The Results of Granger Causality Tests

Excluded	Short-run causality ← Causality flow						
	dFHR	dLCBM	dUSR	dVIX	dINF	dLPI	dEXR
dFHR	---	0.168	0.628	17.285***	0.041	0.581	21.703***
dLCBM	0.298	---	14.851***	7.230***	0.618	15.389***	0.093
dUSR	0.075	3.409**	---	2.933*	1.415	0.165	3.007*
dVIX	0.361	1.185	0.825	---	0.129	1.470	7.889***
dINF	1.639	1.328	7.470***	5.885***	---	1.596	0.071
dLPI	0.488	0.912	19.417***	0.652	0.197	---	0.815
dEXR	1.020	4.716**	3.179***	5.267***	0.399	0.254	---

****, **, * are significance levels at 1%, 5%, and 10%, respectively.*
Source: Authors' estimations.

5. Conclusion

This chapter investigates the role of foreign investors as a channel for external shocks into ASEAN local-currency sovereign bond markets. By estimating a two-equation panel model for five ASEAN economies over the period 2019 Q1–2024 Q3, we first examine the determinants of foreign holdings in local government bonds—incorporating global factors such as U.S. T-bill rate, VIX and domestic macro variables including inflation, exchange rate, policy rate, and COVID-19 dummy. We then analyse how these holdings, alongside the same set of covariates, influence the local bond yield. Panel unit-root and cointegration tests establish long-run relationships, which are estimated via FMOLS and DOLS, supplemented by VECM-based Granger causality for short-run dynamics.

Empirical results reveal that higher U.S. rates, greater global equity-market volatility, and local currency depreciation significantly reduce foreign holdings, whereas higher domestic inflation mildly boosts them; the COVID-19 period markedly discouraged cross-border investment. In turn, increased foreign participation compresses the 5-year yield,

while adverse external and internal shocks—higher U.S. rates, volatility, inflation, and the pandemic dummy—widen it. Short-run causality tests indicate that quarterly yield fluctuations are driven directly by changes in U.S. rates, global risk, and local monetary policy, with foreign flows adjusting more gradually.

These findings carry important implications for monetary and financial stability in ASEAN. Although foreign investors can lower borrowing costs and enhance market liquidity under stable conditions, they may amplify yield and exchange rate volatility during stress episodes. To bolster resilience, ASEAN authorities should deepen domestic investor bases, enhance transparency of foreign bond positions, and deploy macroprudential measures—such as limits on foreign holdings or dynamic reserve requirements. Additionally, fostering regional policy coordination and developing local-currency hedging instruments can mitigate spillover effects, helping to balance the benefits of openness with financial stability.

References

Beirne, J., Renzhi, N., & Volz, U. (2024). Local currency bond markets, foreign investor participation and capital flow volatility in emerging Asia. *The Singapore Economic Review*, 69 (02), 517–541. https://doi.org/10.1142/S0217590821410083

Berensmann, K., Dafe, F., & Volz, U. (2015). Developing local currency bond markets for long-term development financing in Sub-Saharan Africa. *Oxford Review of Economic Policy*, 31(3–4), 350–378. https://doi.org/10.1093/oxrep/grv032

De Leo, P., Keller, L., Simoncelli, G., Villamizar-Villegas, M., & Williams, T. (2025). Global investors in local-currency bond markets: implications for bond yields and exchange rates. SSRN Scholarly Paper No. 5133549. Social Science Research Network. https://doi.org/10.2139/ssrn.5133549

Ebeke, C., & Lu, Y. (2015). Emerging market local currency bond yields and foreign holdings – A fortune or misfortune? *Journal of International Money and Finance*, 59, 203–219. https://doi.org/10.1016/j.jimonfin.2015.07.006

Fonay, I. B. (2022). The effects of foreign investors' holdings on the local currency sovereign bond markets in Latin America. IDB Publications. https://doi.org/10.18235/0004240

González-Rozada, M., & Yeyati, E. L. (2008). Global Factors And Emerging Market Spreads. *The Economic Journal*, 118(533), 1917–1936. https://doi.org/10.1111/j.1468-0297.2008.02196.x

HKMA. (2020). Foreign participation in the local currency bond markets of emerging market economies: Good or bad for market resilience and financial stability? *B*IS Papers, No 113. Hong Kong Monetary Authority.

Ho, E. H. C. (2022). Foreign participation in local currency government bond markets in emerging Asia: Benefits and pitfalls to market stability. *Journal of International Money and Finance*, 128, 102699. https://doi.org/10.1016/j.jimonfin.2022.102699

IMF. (2012). Global financial stability report, October 2012: Summary version. In Global Financial Stability Report, October 2012. International Monetary Fund. https://www.elibrary.imf.org/display/book/9781616353902/9781616353902.xml

IMF. (2024). *Global* financial stability report, October 2024 - Steadying the Course: Uncertainty, Artificial Intelligence, and Financial Stability. https://www.imf.org/en/Publications/GFSR/Issues/2024/10/22/global-financial-stability-report-october-2024

Jaramillo, L., & Weber, A. (2013a). Bond yields in emerging economies: It matters what state you are in. *Emerging Markets Review*, 17, 169–185. https://doi.org/10.1016/j.ememar.2013.09.003

Jaramillo, L., & Weber, A. (2013b). Global *spillovers into domestic bond markets in emerging market economies*. IMF Working Papers, 2013(264). https://doi.org/10.5089/9781484328446.001.A001

Le H. T., & Nguyen T. T. (2024). Tác động của bất ổn chính sách kinh tế thế giới tới rủi ro sụp đổ giá trên thị trường chứng khoán Việt Nam. *Tạp chí Kinh tế và Phát triển*, *Đặc biệt*, Article Đặc biệt. https://js.ktpt.edu.vn/index.php/jed/article/view/1681

Le, T. L., Huynh, T. C. H., & Le, T. H. M. (2015). Tác động của các chỉ số kinh tế vĩ mô đến dòng vốn đầu tư gián tiếp nước ngoài (FPI) tại Việt Nam. *Tạp Chí Phát Triển & Hội Nhập*, *20*(30). https://vjol.info.vn/index.php/HVNH-KHDAOTAONH/article/view/72774/61703

Miyajima, K., Mohanty, M. S., & Chan, T. (2015). Emerging market local currency bonds: Diversification and stability. *Emerging Markets Review*, *22*, 126–139. https://doi.org/10.1016/j.ememar.2014.09.006

Morozumi, A., Bleaney, M., & Sulistiono, A. P. (2023). Types of foreign investor and local-currency bond markets in emerging economies. SSRN Scholarly Paper No. 4586788. Social Science Research Network. https://doi.org/10.2139/ssrn.4586788

Park, C. (2016). Developing local currency bond markets in Asia. ADB Economics Working Paper Series, 495. Asian Development Bank (ADB), Manila.

Tran T. T. H. (2018). Sử dụng bộ chỉ số đánh giá mức độ hội nhập tài chính để đánh giá mức độ hội nhập thị trường trái phiếu Chính phủ Việt Nam. *Tạp chí Khoa học và Đào tạo Ngân hàng (Tên mới: Tạp chí Kinh tế - Luật và Ngân hàng)*, *192*, Article 192. https://vjol.info.vn/index.php/HVNH-KHDAOTAONH/article/view/72774

Uribe, M., & Yue, Z. V. (2003). *Country spreads and emerging countries: Who drives whom?*

Wang, Q., Gao, S., Li, J., & Leibrecht, M. (2023). Do foreign investors affect the volatility of local currency bond prices? Empirical evidence from China. *Heliyon*, 9(6), e16658. https://doi.org/10.1016/j.heliyon.2023.e16658

CHAPTER 9

CAMBODIA AND PREPARATION FOR FOREIGN INVESTOR PARTICIPATION IN THE GOVERNMENT BOND MARKET[1]

By
Sophea Eng and **Vibunrith Long**[2]

1. Introduction

In preparation to move from a less developed country to be an upper middle-income country by 2030, Cambodia needs to strengthen its capacity and diversify financing sources to meet public investment needs as the sources of finance from concessional loans and grant sources will gradually decline. To address this circumstance, developing government securities market is a key mechanism to tap sources from both local and international investors. The Cambodia government bond market is now still at a nascent stage of development as the market just had its first issuance in 2022. Despite of the late issuance, Cambodia is determined to develop its market following the Policy Framework on the Development of Government Securities 2023-2028, which serves as a roadmap for developing a robust and comprehensive system for managing the issuance and trading of government securities. Currently, there are still limitations for market growth stemming mainly from the narrow investor base combined with the lack of a primary dealer system. As a response, two regulations were enacted in 2024 to allow securities firms to act as intermediaries, giving them direct access to participate in the auction in the primary market and invest for their clients. By allowing them to be intermediaries, it helps bring in more potential investors and enhances the openness of the market to global investors. Given the potential of foreign participation in the market, this study aims to assess foreign investors' spillover within the local currency government bond market (LCBM), explore the practices and implementation in 5 regional bond markets (Indonesia, Malaysia, Thailand, Vietnam, and Cambodia) and discuss policy responses to maintain market resilience and ensure financial stability while having foreign investor participation. This study is organised as follows. Section 2 reviews existing literature regarding the benefits and costs of foreign investor participation in the bond market, previous studies and findings related to the impact of foreign investors on the LCBM and measures for managing foreign investors' spillover. Section 3 presents an overview of Cambodia's current government bond market and its action plan for developing the market further. Section 4 compares Cambodia's bond market with the other 4 regional economies. Section 5 provides considerations for further development based on literature review and market comparison.

1. The views and analysis expressed in this paper are those of the authors, and do not necessarily represent the views of the National Bank of Cambodia.
2. From the National Bank of Cambodia.

2. Literature Review

2.1 Benefits and Costs of Foreign Investors' Participation in the Bond Market

According to ADB (2013), foreign investors contribute positively to the development of bond markets. Key factors that drive their participation in supporting the market, include increasing the demand which will then lower the pressure on the local interest rate, improving liquidity by broadening the investor base, creating more trading strategies, introducing higher standards of governance, transparency, promoting more global awareness of the opportunities in the markets, encouraging more professionalism of the market and adoption of global best practices with the presence of high-quality professionals, bringing in more financial innovation and contributing to a culture of investment as the capital is used for valuations and expected returns. While looking at the benefits of foreign participation, the study also analyses the important factors for attracting foreign interest, which include sound economic fundamentals such as high yields, sustainable government debt, high potential for currency appreciation, political stability, regulatory openness and consistency, free capital flow, high liquid market, exemption of taxes on investment income and capital market transactions, efficient clearing and settlement systems, available market for interest rate and currency hedging instruments, and benchmark factors related to the demand for bonds of a particular country due to its inclusion in an index.

Sienaert (2012) mentions that foreign investor participation in local currency bond markets is generally beneficial to the growth of the domestic bond market by bringing more diversification and expanding the demand while also resulting in lower borrowing costs. However, while the participation from foreign investors may bring benefits to local bond market development, there are also threats to the market when the number is too large and volatile.

Berensmann, Dafe, and Volz (2015) suggest that the participation of foreign investors in developing LCBMs should proceed with careful consideration. While these markets can benefit from a reduction in currency mismatch risks and an enhancement in financial stability, less developed markets tend to be more vulnerable to sudden shifts in capital flow. The "taper tantrum" of May 2013 when foreign investors suddenly withdrew from emerging markets following the U.S. Federal Reserve's announcement of plans to reduce its bond purchases posts threats associated with a heavy reliance on foreign capital. Beirne, Renzhi, and Volz (2021) also found that the increase in participation of foreign investors in LCBMs tends to increase capital flow volatility. This impact is especially pronounced in economies where LCBMs are less developed. However, as LCBMs grow and strengthen, the influence of foreign investor participation on volatility decreases, making these markets less sensitive to external shocks linked to foreign ownership.

2.2 Related Studies on the Impact of Foreign Participation in Bond Market

Peiris (2010) conducted a study to examine the impact of foreign participation in government bond markets on the volatility of long-term bond yields in 10 emerging markets (Korea, Malaysia, Mexico, Turkey, Brazil, the Czech Republic, Hungary, Indonesia, Poland and Thailand) from 2000 to 2009. The analysis suggests that greater foreign inflows do reduce government bond yields, with a 1-percentage-point rise in the bond share held by foreign investors resulting in a decrease in yields of approximately 6 basis points. The author also uses a time series approach to check the impact of foreign participation on the fluctuation of long-term bond yields in EMs. The results reveal that having greater foreign participation significantly increases yield volatility in one country (Korea) but constrains it in other countries, such as Malaysia, Mexico, and Turkey, while being an insignificant explanatory variable in the remaining cases. Ebeke and Lu (2014) found similar results. The authors analysed the relationship between foreign investor involvement in LCBM markets and its effects on bond yields and volatility across EMEs, particularly in the aftermath of the 2008 Global Financial Crisis. Their sample presents a diverse group of EMEs across Latin America (Brazil, Mexico), Central & Eastern Europe (Czech Republic, Poland, Hungary), and Asia (Indonesia, Malaysia, Korea, Thailand, Turkey). The study found that foreign holdings of LCBM in EMs have decreased bond yields. Their result shows that for each 10-percentage point increase in the share of government bonds held by foreign investors, bond yields decreased by about 90 basis points. Another study from Ebeke and Kyobe (2015) investigated the impact of foreign participation for 17 emerging markets economies from 2004 to 2023. The authors looked at two areas, the first was to examine whether the role of foreign participation causes any global financial shocks to the EM government bond markets. Second, they analysed whether the impact of foreign participation in foreign-currency denominated bond yields differs from local-currency denominated bond yields. The results show that higher foreign participation in LCB increases the transmission of global financial shocks, especially when a threshold reached a certain level (foreign holding above 30%). However, this result only applied to foreign holdings of local-currency denominated but not for foreign holdings of foreign-currency denominated (e.g., Eurobond) bond markets.

2.3 Studies for Recommendations on Policy Measures in Managing Foreign Investors' Spillover

Ho (2019) stated that foreign participation provides a "double-edged sword" effect in local currency (LC) bond markets. While lowering yield by increasing demand and liquidity during stable conditions, the LC bond yield's spread widen during market stress when there is high expected risk of currency deprecation, which will likely lead to a raise in the borrowing cost, causing capital flight. The paper gives two suggestions, first is to develop and advance the FX derivatives market for foreign investors to hedge against currency risks. This helps prevent the sudden shift in capital outflow when global financial stress arises. The evidence from the study shows that economies with higher developed FX derivatives markets with higher turnovers in OTC derivatives tend to experience lower increase in bond

yield spread during market stress, even when the market have large foreign participation. Second is to expand the domestic investor base by focusing on attracting more long-term saving, particularly from pension reforms. When the market consists of a stronger base of domestic investors, the market is more stabilised during periods of shock.

HKMA (2020) found that while increasing foreign participation leads to a narrowing of local currency government bond yield spreads in EMEs in Asia, foreign investors are sensitive to currency risk which causes the yield spread to widen when market distress happens. The volatility impact on local currency bond funds appears to get greater than hard currency bond funds. Two policy implications are recommended which include developing foreign exchange derivatives markets and diversifying the investor base of the EME market, particularly focusing on domestic investors.

Sienaert (2012) shared perspectives of debt managers that foreign investors differ notably from most domestic investor - that local currency sovereign bonds in any tenor are considered risky assets. This raises concern about abruptions or reversals in demand of foreign investor during internal or external shocks. Therefore, strategic measures should consider, among others, the improving of market monitoring, preparing statistics that contains timely availability and quality of ownership, building good investor communication, and providing better outreach to build a strong network with key investors.

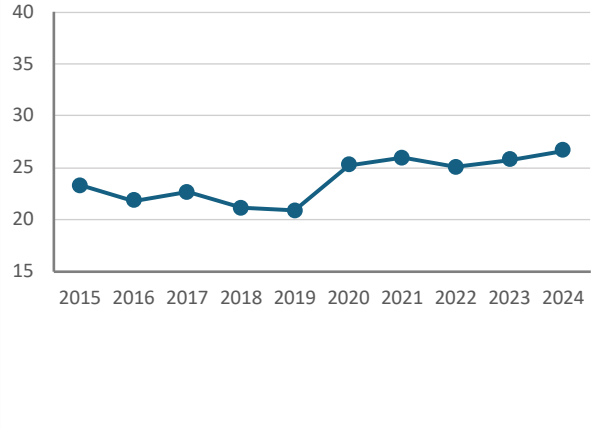
The CGFS (2007) cautioned that when there is an increase in foreign participation, it might also cause vulnerabilities especially in the market that has weak infrastructure or small investor base. Sudden outflows of capital or shifts in investor sentiment can lead to heightened volatility, especially in countries lacking robust derivatives and risk management tools. The paper points out the need for sound regulatory frameworks, well-developed market infrastructure, and a strong base of domestic institutional investors to ensure stability while benefiting from foreign investment in local bond markets. Countries with sound macroeconomic fundamentals appeared to be resilient during the time of financial market instability.

Beirne, Renzhi, and Volz (2021) provided policy implications to ensure financial stability, by emphasising that the markets are not encouraged to put much reliance on foreign investors but rather strengthening the local investor base and mobilising domestic resources. Developing FX hedging tools is also essential in reducing risk related to investment from foreign countries in LCBM, which is necessary during a financial stress period when high volatility of the exchange rate leads to sudden capital outflow. Strengthening these areas will help emerging markets mitigate the vulnerability of their bond markets to destabilising spillovers from foreign capital movements.

3. Overview of the Government Bond Market in Cambodia

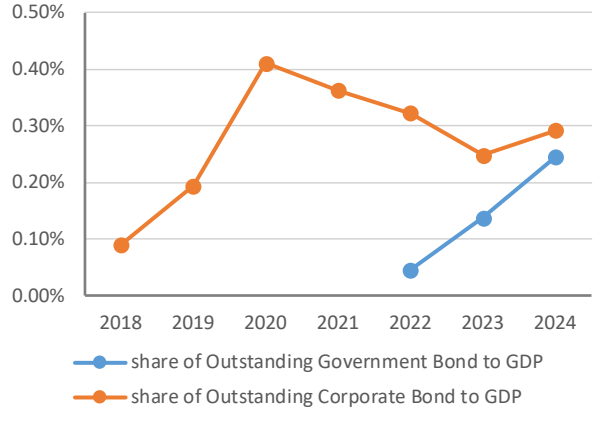
In Cambodia, the local currency bond market encompasses government bonds and corporate bonds. Corporate bonds were initially issued in 2018 while Government bonds entered the market in 2022. The market for corporate bonds remains small as the share of corporate bonds to GDP stood at 0.29%. The Government bond market is relatively young compared to many other SEACEN economies as the bonds have been issued for only 4 years while the market size is also small currently due to limited participants and limited bond issuance volume (annual issuance plan is around 100-125 million USD). The outstanding balance of government bonds remains low, accounting for just 0.24% of GDP in 2024. This is especially clear in comparison with neighbouring country of Vietnam, where government bonds account for 23% of GDP. The reasons behind the late issuance of government bonds are due to several historical and macroeconomic factors. As Cambodia has been largely provided with foreign aid and concessional financing from developing partners like the World Bank, ADB and bilateral donors, this has made Cambodia less reliant on other financing sources. It likewise helps the country maintain a low cost of debt repayment and buffer the country from volatile debt cost. Moreover, the level of Cambodian public debt has remained below 30% of GDP in 2024. Along with less demand from the Government to finance sources issuing bonds, KHR-denominated bonds appear to be unattractive as the economy is highly dollarised while some potential investors' investment sources are in USD.

Figure 1: Cambodia Gross Debt, Percent of GDP



Source: IMF.

Figure 2: Share of Cambodia Outstanding Government Bond and Corporate Bond to GDP



Source: CSX and NBC.

The issuance of government bonds was carried out in accordance with the law on government securities and the Prakas on issuance of government securities where the National Bank of Cambodia (NBC) is appointed as the fiscal agent. As of May 2025, KHR 759.4 billion (USD 189.85 Million) had been issued for different maturities including, 1 year, 2 years, 3 years, 5 years, 10 years, and 15 years in local currency. The issuance of the government bonds has shown a progressive growth for the past three years. However,

currently only local investors from the banking sector and few from fund and insurance companies are the primary sources of financing while the secondary market remains inactive. The majority of the outstanding bonds are short-term which also constraints the market from building a benchmark yield curve.

Figure 3: Issuance Amount of Cambodia Local Currency Corporate Bond and Government Bond

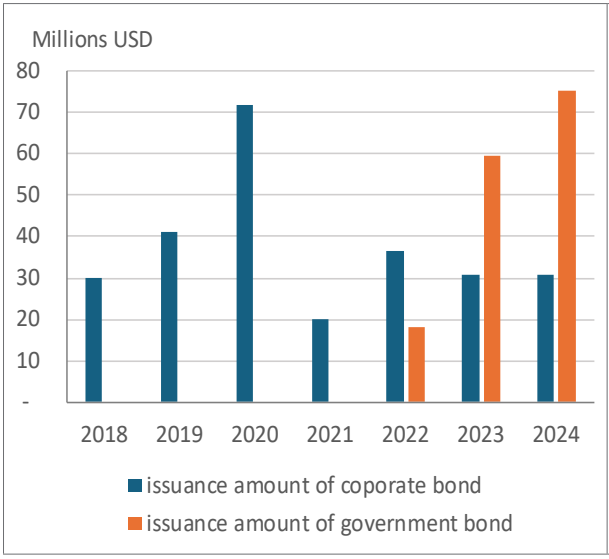
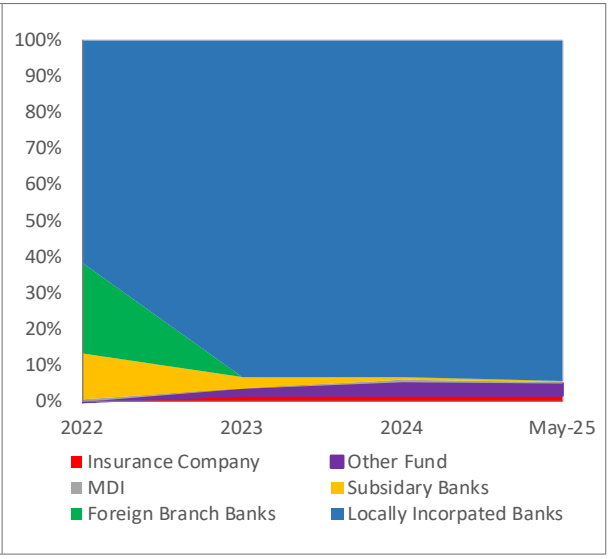


Figure 4: Share of Type of Investors Holding Government Bond



Source: NBC and CSX.

From domestic investors' perspective, banks and MFIs mainly find that bond yields and coupon rates are not competitive, as their cost of funds is higher than the returns from investing in government bonds, discouraging them from investing,

Figure 5: Average Coupon Rate of Government Bond

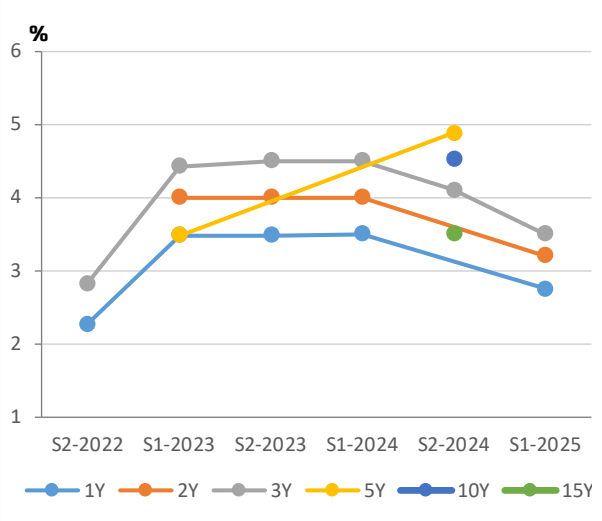
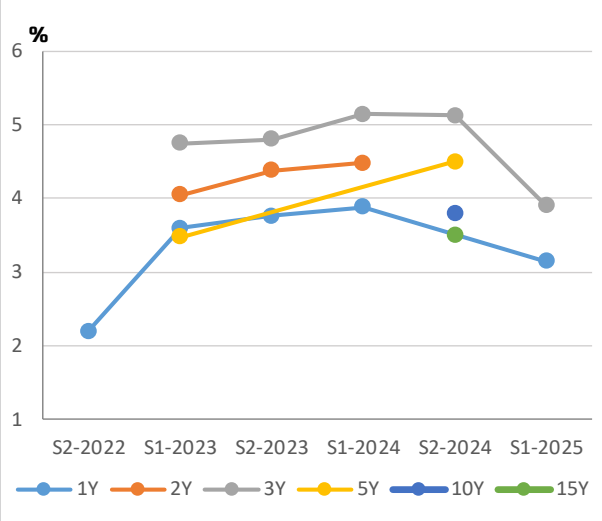


Figure 6: Average YTM of Government Bond



Source: NBC.

** Tenor 10 and 15 years were issued in private placement.*

Despite issuing government bonds for just four years, there is anticipated growth as the Government has been trying to expand the investor base. From 2022 to late 2024, only banks and financial institutions licensed by NBC have been permitted to participate in the auction, while a few specific institutions are allowed to subscribe to government bonds through private placements. Similar to some other SEACEN member economies which have implemented various policy measures and incentive schemes to attract more investors, Cambodia has offered favourable treatment including tax exemptions on capital gains and 50% reductions on withholding taxes for government bonds as part of enhancing the attractiveness of local currency government bonds. Additionally, NBC issued a Circular on the Treatment of Government Securities held by Banks and Financial Institutions, which recognises government bonds as a 0% risk weight in calculating the solvency ratio and as high-quality liquid assets.

While investors can benefit from tax incentives, Cambodia's investment environment, in general, has maintained an open and investor-friendly regulatory framework for foreign capital flows, primarily governed by the Law on Investment (2021).The key policies and legal framework include: 1) Free repatriation of funds including capitals, all types of incomes and settlements, 2) Foreign Ownership where foreign investors can own up to 100% of businesses, except for land ownership, and 3) Guarantee and Protection for which the law ensures no nationalisation and expropriation of private assets, no discrimination between foreigner and locals, and protection against unfair treatment. The Law on foreign exchange (1997) also sets no restrictions on foreign exchange operations including buying and selling of foreign exchange, transfers, international settlements, and capital flows in foreign or domestic currency, albeit they have to do the transactions through intermediaries.

In addition to policies promoting incentives and liberal investment, there are additional key indicators that contribute to Cambodia's economic resilience to external shocks and enhance the attractiveness of its investment environment. Cambodia has maintained a very stable exchange rate for over 20 years with daily fluctuation typically within a narrow band of 2% or less. Meanwhile, foreign reserves remain substantial, maintaining 7 months of the imports in 2024.

Figure 7: FX Volatility-KHR (2005-2024)

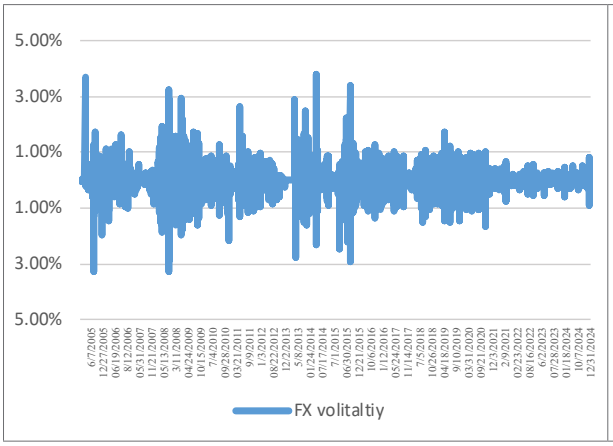
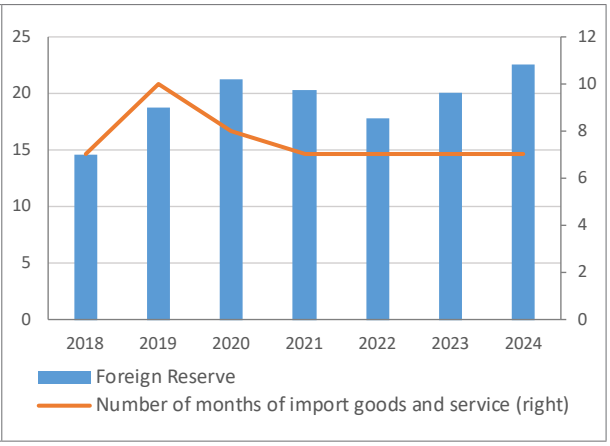


Figure 8: Cambodia Foreign Reserve (in billion USD, 2018-2024)



Source: NBC.

3.1 Further Steps in Improving Cambodia's Government Bond Market

To support ongoing market growth, the Ministry of Economy and Finance has developed the "Policy Framework on the Development of Government Securities (PFDGS) 2023 – 2028" to serve as a roadmap for developing a robust and comprehensive system for managing the issuance and trading of government securities. In the PFDGS, policy measures are implemented in two phases, comprising: Phase 1 (2023 - 2026) establishing a complete management system for issuance and trading of government securities domestically; and Phase 2 (2027 - 2028) to review and improve the management system for issuance and trading of government securities domestically and continuing to prepare for the issuance of international bonds internationally when needed. Cambodia has been working on improving its bond market with the support from the ADB through technical assistance to further develop the market. This support includes a comprehensive assessment of market intermediaries, infrastructure, product design, demand analysis, and channel strategies for the General Department of International Cooperation and Debt Management (GDICDM). The key developments will be placed in both primary and secondary markets, including the development of an internal primary market pricing tool and tools for monitoring markets, the establishment of an investor relations website, and raising awareness by creating scalable market education content through various platforms. The project will also provide further enhancements to secondary market regulations, as well as establishing performance indicators and reporting mechanisms, and assessing risks. After fully enhancing the market, the project will continue supporting the evaluation of trading infrastructure for the secondary market, advising on strategies for pre- and post-trade data management, and market valuation methods for financial instruments in collaboration with GDICDM, Securities and Exchange Regulator of Cambodia (SERC), and the NBC.

From the current issuance experience, we have noticed that although the investment climate in Cambodia's government bond market is generally open, the only investors in the market are from the banking sector. More effort should be put into attracting a wider range of investors to engage in the market. In the effort of expanding the investor base, two regulations were enacted in late 2024, 1) Prakas on permitting non-banks using NBCP for conducting government securities transactions, and 2) Prakas on the management of government securities intermediaries, which allow non-banks to participate in the auction directly. Through these two regulations, other types of investors, including foreign investors, can also participate through a government bond intermediary approved by the NBC and accredited by SERC.

4. Market Comparison

4.1 Market Size Comparison

Cambodia's local currency government bond market, launched in 2022, is the youngest among its regional peers, with a total capitalisation of USD 0.12 billion. The size of the three-year-old market is still small compared to its more established neighbouring markets, including Indonesia (USD 387 billion), Thailand (USD 297 billion), Malaysia (USD 273 billion), and Vietnam (USD 99 billion). In terms of market size relative to GDP, Cambodia stands at 0.26%, compared to 74% in Malaysia, 54% in Thailand, 28% in Indonesia, and 22% in Vietnam, reflecting the limited scale and activity of its market. Unlike Malaysia (21%), Indonesia (15%), and Thailand (9%), Cambodia's bond market has no foreign investor participation to date. However, it is still in the foundational phase, gradually building the infrastructure, regulatory framework, and investor confidence for future growth and integration into the regional financial system.

Table 1: Market Size Comparison

Data as of 2024

	Indonesia	Malaysia	Thailand	Vietnam	Cambodia
Market Launch	1946	1970	1998	2000	2022
LCY Gov't Bond Capitalisation (USD Bil.)	387	273	297	99	0.12
GDP (USD Bil.)	1375	369	545	552	47
LCY Gov't Bond in % of GDP	28%	74%	54%	22%	0.26%
Foreign Holding	15%	21%	9%	0.13%	0%

Sources: ABO, IMF, NBC, ThaiBMA, BIS, BNM.

4.2 Foreign Access, Capital Flow Management, and FX Control

Table 2: Entry Requirement, Capital Flow Management and FX Control

Indonesia	2012 Status • No approval or registration is required for the non-resident investors for investing into Indonesia. • There is no restriction for non-resident investors in Indonesia. 2017 Updates • Like a domestic investor, foreign investor must obtain a Single Investor Identification (SID) via their selected custodian bank or broker. • FX transactions shall be undertaken with underlying transaction (the real demand principle). • Repatriation of sale proceeds may occur without restriction but the proceeds in rupiah will need to be exchanged for foreign currency before remitting them to another jurisdiction. 2021 No update
Malaysia	2012 Status • Foreign investors are free to invest in Malaysia. • Investment of ringgit assets by foreign investors may be funded from i. foreign investors' own ringgit accounts ii. sale of foreign currency with licensed onshore banks; or iii. borrowing from licensed onshore banks • There is no restriction for foreign investors to repatriate funds. However, repatriation must be made in foreign currency other than the currency of Israel. 2016 Update • There are no specific market entry and exit requirements for foreign investors in the Malaysian bond market. • There is no restriction on the amount of foreign currency remitted into or out of Malaysia by nonresidents. • Foreign exchange conversions from Malaysian ringgit must be transacted with a licensed onshore bank or an appointed overseas office of a licensed onshore bank with a back-to-back arrangement. • The purchase or sale of foreign currency or hedging involves foreign currency is widely available with licensed onshore banks.

Thailand	2012
	• No market-entry requirements to foreign investors except a few notable restrictions on foreign exchange control.
	• Foreign currencies can be brought into Thailand without any limitations; however, they shall be sold for Thai baht to or deposited with an authorised financial institution within 360 days.
	• Measures to Prevent Thai Baht Speculation
	  ○ *Thai baht liquidity:* Thai baht liquidity provided to a nonresident shall be undertaken with underlying trades or investments (so-called 'real demand principle'), otherwise it shall be limited to THB300 million per group of non-residents.
	  ○ *Capital Inflows:* Borrowing by banks from non-residents shall not exceed THB100 million per group of NRs.
	  ○ *Baht Account:* Non-resident Baht accounts are limited to a balance not exceeding THB300 million per non-resident. No interest payment to non-resident baht accounts
	  ○ *Non-deliverable forward (NDF):* NDF transaction is not allowed for non-residents
	
	2016 Updates
	• Thai baht liquidity provided to a nonresident shall be undertaken with underlying trades or investments (so-called 'real demand principle'), otherwise it shall be limited to THB600 million (an increase from THB300 million) per group of NRs.
	• Borrowing by banks from non-residents shall not exceed THB10 million (a reduction from THB100 million) per group of NRs. The same amount applicable to the issuance of Baht denominated debt securities by banks to non-residents.
	
	2021 Updates
	• A new market entry requirement for nonresident investors is the Bond Investor Registration (BIR) with the BOT
	• Thai baht liquidity provided to a nonresident shall be undertaken with underlying trades or investments (so-called 'real demand principle'), otherwise it shall be limited to THB200 million (a reduction from THB600 million) per group of NRs.
	• Non-resident Baht accounts are limited to a balance not exceeding THB200 million (a reduction from THB300 million) per non-resident.

Vietnam	2012 • Foreign investors without a legal presence in Viet Nam are prohibited from investing in and trading of T-bills. • Foreign investors need to obtain a securities trading code prior to being allowed to invest in the securities market. • There is no limit imposed on investments in government bond instruments for foreign and domestic investors, both institutional and individual. 2018 • There are no specific market exit requirements for nonresident investors. Upon the sale of debt securities, foreign investors are free to repatriate proceeds, including interest and investment gains. • The disposal of debt securities is subject to applicable taxation on a transaction. Foreign investors must complete the declaration and payment of personal income tax. • Nonresident investors are able to freely execute foreign exchange transactions. • Online STC registration system for foreign investors, launched on 1 January 2016, shortened Securities Trading Code (STC) issuing time from 3-5 days to only 1 day. Foreign investors can then open securities trading accounts and make investments right after STC issuance.
Cambodia	• Foreign investors can invest in government securities either in the primary market or secondary market via an authorised government securities intermediary. • There is no entry requirement for foreign investors investing in government securities while the regulations governing the trading of government securities and code of conduct of the government securities intermediary are being developed. However, both local and foreign investors investing in non-government securities under the supervision of the Securities and Exchange Regulator of Cambodia (SERC) are required to have an investor ID provided by SERC and to open a securities trading account with a licensed securities broker, as a perquisite. • There is no limitation or restriction on foreign investment in government securities. • There is no restriction on capital repatriation by non-residents. • Foreign investors must conduct FX transactions within permissible amounts as determined by the NBC. • Larger transactions often necessitate a declaration and may be subject to additional scrutiny to prevent illicit activities, such as money laundering or terrorist financing.

Note: The data derives from specific periods of market evolution as reported in the Bond Market Guide published by the Asian Development Bank for Indonesia (2012, 2017, 2021), Malaysia (2012, 2016), Thailand (2012, 2016, 2021), Vietnam (2012, 2018).

The current framework on market entry capital flow management and FX control is relatively open and less restrictive for foreign investors in Cambodia's government securities market. They are allowed to invest in both the primary and secondary markets via a licensed securities broker without prior approval or restriction. There's freedom in repatriating funds, easing foreign investors' accessing and exiting the market. FX transactions are generally allowed within a level set by the NBC, with bigger transactions requiring declaration for reporting purposes on anti-money laundering and counter-terrorism financing. While investors of non-government securities are subject to having an Investor Identification (Investor ID) from the SERC, it is not clear whether the requirement shall be applicable for government securities. Since this system is already in place, there is thus an advantage for Cambodia to align itself with regional practices, contributing to investor monitoring, if it is adopted for government securities.

Despite of the above advantages, Cambodia's regulatory and infrastructure framework has some limitations. The lack of sufficient regulation governing government securities for example, regulations and guidelines relevant to securities trading in the secondary market create legal and operational uncertainty, particularly for institutional investors seeking long-term investment horizons. Moreover, the uncertainty of applying centralised investor registration system for government bondholders would put into question the authorities' ability to effectively monitor foreign ownership, capital flows, and systemic risk exposure in the future. In contrast to its regional peers, Cambodia also lacks FX and capital management related tools to cope with short-term speculative inflows and outflows. Without mechanisms such as the real demand principle, transaction caps, or liquidity limits, Cambodia would be vulnerable to sudden and potentially destabilising shifts in foreign investor behaviour.

There are several lessons that Cambodia could learn from the experience of its regional peers. Thailand Indonesia and Vietnam utilise a system of gradual tightening through the introduction of Single Investor Identification, to improve the monitoring and surveillance. Thailand stipulates how FX and liquidity are carefully managed to avoid Thai baht speculation such as liquidity cap, account balance limits, and real-demand principles and restriction on non-deliverable forward transactions by non-residents. Vietnam illustrates the advantages of early utilisation of a digitalised investor registration system and the importance of procedural clarity for market participation.

4.3 Tax and Investment Incentives

Table 3: Tax and Investment Incentives

	Malaysia	Thailand	Indonesia	Vietnam	Cambodia
Tax on Government securities on foreign investors / Non-residents	• No capital gains tax • No WHT • No Stamp Duty	• Capital gains tax: 15% (exempt for individual) • WHT: Exempt • No Stamp Duty	• No capital gains tax • WHT: 10% (reduced from 20%) • No Stamp Duty	• No Capital gains tax • Interest Income: 5% • Stamp Duty: 0.1% • Corporate income tax not applicable	• No Capital gains tax • WHT: 7% (50% off from 14% as an incentive) • No Stamp Duty

Source: ABO, ThaiBMA, VBMA.

Compared to its regional peers, Cambodia offers a relatively competitive tax environment for foreign investors in its government bond market. Similar to Malaysia, Indonesia, and Vietnam, Cambodia does not impose capital gains tax or stamp duty on government securities held by non-residents. However, Cambodia applies a 7% withholding tax (WHT) on interest income—lower than Indonesia's 10% and Vietnam's 5%, though Malaysia imposes no WHT at all. In contrast, Thailand enforces a 15% capital gains tax (with exemption for individuals) but provides WHT exemptions. Overall, while Cambodia's tax regime is not the most favourable in absolute terms, it remains attractive by regional standards, particularly due to the absence of capital gains tax and stamp duty, and a reduced WHT rate, which supports its appeal as a growing destination for foreign investment in government bonds.

4.4 Yield and Fundamental Indicators

Table 4: Yield and Fundamental Indicators

Data as of 2024

	Malaysia	Thailand	Indonesia	Vietnam	Cambodia
Market Yield*					
3-year	3.48%	2.05%	6.57%	1.93%	5.125%
5-year	3.62%	2.10%	7.01%	2.15%	4.50%
10-year	3.82%	2.30%	7.00%	2.88%	3.80%
Sovereign Credit Rating	**Fitch** **BBB+** **Stable** **2024-06-27**	**S&P** **BBB+** **Stable** **2024-11-24**	**S&P** **BBB** **Stable** **2024-07-30**	**Fitch** **BB+** **Stable** **2023-12-08**	**Moody's** **B2** **Stable** **2024-05-16**
Inflation (%)	1.8%	1.2%	1.6%	3.6%	0.8%
Interest Rate	1D KLIBOR 3.000%	1D BIBOR 1.750%	1D INDONIA 5.188%	1D VNIBOR 1.425%	1D MLF** 5.5%

Data as of 2024

	Malaysia	Thailand	Indonesia	Vietnam	Cambodia
Exchange Rate Volatility* **	0.0242	0.0225	0.0243	0.0090	0.0073
Foreign Reserve / Imports	5.0 months	7.9 months	6.5 months	2.5 months	7 months
Currency Risk Hedging Instrument					
- Onshore FX forward	- Avg daily FX forward vol: USD 1.1bn 1mo spread: 30 pips Avg daily FX swap vol: USD 6.4bn 1–12mo spread: 3-30pips	- Avg daily FX forward vol: USD 1.5bn Up to 3mo spread: 2-4 pips 6–12mo spreads: 4-6 pips	- Avg daily FX forward volume: USD 500m Spread: 10 pips Avg daily onshore NDF (DNDF) volume: USD 500–700m Spread: 5 pips	- N/A	- N/A
- Non-resident access to onshore FX hedging	- Yes, with underlying commitment (via a licensed onshore bank or appointed overseas office); institutional investors are also eligible for the Dynamic Hedging Programme without documentation.	- Yes, unlimited with underlying commitment. If no underlying, amounts are restricted.	- Yes, with underlying documentation (above a threshold)	- N/A	- N/A
- Offshore market	- The central bank does not recognise offshore trading in MYR, including NDFs	- N/A	- Avg daily options volume: USD 50m	- N/A	- N/A
Government Bond Trading Turnover	0.82	1.47	2.09	1.23	N/A

** Market Yield for Malaysia, Thailand, Indonesia, and Vietnam extracted from BNM, ThaiBMA, World Government Bond and VBMA for the date as of Dec 2024. For Cambodia, since market yield is not yet available, average yield at issuance is used (3-year tenor comprises of all auctions. 5-year tenor comprises of one auction and one private placement. 10-year tenor comprises of one private placement.)*

*** MLF – Marginal Lending Facility is an on-demand overnight lending facility from NBC to banks and FIs.*

**** Standard deviation of monthly change percentage of exchange rate based on author's calculations*

Source: ABO, CEIC, Trading Economics, IMF, WB, NBC, Investing.com.

Based on regional comparison, Cambodia's government bond yields across all tenors including 3-year, 5-year, and 10-year are relatively attractive in 2024 at 5.125%, 4.50%, and 3.80% respectively, higher than those in Malaysia, Thailand, and Vietnam, but below Indonesia's. However, this higher return should be viewed in the context of Cambodia's sovereign credit rating (Moody's B2), which is lower than its regional peers, all of whom are rated investment grade. Cambodia also maintains low inflation at 0.8%, suggesting real positive returns for investors. In terms of currency value, Cambodia has a very low exchange rate risk given its low FX volatility and substantial foreign reserve. Vietnam also maintains a low-risk profile, with limited VN Dong volatility due to a managed exchange rate regime and a fixed trading band. However, its lower reserve level lessens its ability to respond to external shocks. In contrast, Malaysia Thailand and Indonesia face higher exchange rate risk, showing higher FX volatility despite having solid to strong reserves to absorb external pressures. Despite low currency risk, the absence of a FX derivative market in Cambodia may give foreign investors slight concern on currency risk management compared to countries like Thailand Malaysia and Indonesia, where hedging tools are advanced and diverse. On macroeconomic stability, Cambodia is comparable to Malaysia and is even better than Vietnam, supporting a degree of macroeconomic resilience. Overall, Cambodia's bond market offers high nominal and real yields in a low-inflation environment, albeit with higher credit and currency risks, reflecting its nascent market status relative to more mature regional peers.

5. Considerations for Further Development

As Cambodia needs foreign participation to expand and develop the government bond market, it must implement a policy framework that is strategic and balanced by promoting capital inflows, while at the same time, maintaining the stability of the local currency government bond market against potential external shocks. Foreign investors are one of the key players in market development by enhancing liquidity, lowering yields, and fostering improved transparency and infrastructure. Thus, there are certain areas that Cambodia should consider in improving its attractiveness to foreign investors, drawing lessons from regional practices. However, as evidenced by empirical studies, their participation can also increase capital flow and yield volatility, especially in small and less developed markets, if not carefully managed. To ensure market resilience and stability while attracting foreign participation, the following key measurements can be considered:

A. Continuing to develop sound regulatory framework and robust infrastructures

Sound and transparent regulations are essential for building investor confidence. As Cambodia is still at the early stage of government bond market development, many regulations are still missing or under development such as regulations on secondary trading, settlement, depository, investor rights, disclosure, code of conduct of the government securities intermediary, and clear guidelines and procedures on foreign access and investment. Cambodia should prioritise the completion and enforcement of a comprehensive legal and regulatory framework to attract long-term foreign investors.

Equally important is building a robust infrastructure to ease foreign investor participation. One of the infrastructure improvements that has been discussed, for policy makers to consider in this study, is the adoption of single investor identification like Indonesia, Thailand and Vietnam which use the Investor Identification scheme that is applicable to investors in non-government securities in order to track foreign bondholding at individual levels and their capital movement and FX activity, which is crucial for regulators in managing market volatility in the case of external shocks.

B. Improving sovereign credit rating

On top of providing a competitive market yield, Cambodia's low sovereign credit rating which is B2 by Moody's creates a significant obstacle for many institutional investors who generally do not invest in non-investment grade government securities. Improving the country's credit rating will not only attract larger, long-term institutional investors, including those with rating thresholds for investment eligibility but also help to reduce borrowing costs.

C. Developing the FX derivative market

Despite the fact that Cambodia has maintained stable exchange rate for the last 20 years, the absence of FX hedging instruments may be an area of concern for foreign investors in the future especially when the market grows, and foreign participation reaches a certain limit that could swing the exchange rate and bond price by sudden bulk sales of local currency bonds as they are sensitive to external shocks. The FX derivative market would be supportive not only of foreign investors but also of domestic institutional investors like insurance companies and banks whose fund holdings are mostly in US Dollars (Cambodia being a dollarised economy). The FX derivatives market will protect investors from currency risk and hence support the growth of the local government bond market.

D. Introducing managing tools for capital flow volatility

Cambodia may consider designing tools to manage and mitigate the risk of volatile capital flows arising from external stocks when foreign participation in local currency bond market reaches a certain level. Existing studies find that higher foreign participation in LCB increases the transmission of global financial shocks, especially when a threshold reaches a certain level; for example, above 30%. The threshold could serve as an indication that balances between openness to foreign investment and safeguarding market stability from absorbing spillover effects. Drawing from experiences of Thailand and Indonesia, potential measures include enforcing real demand principles for FX transactions, imposing caps on FX transactions without underlying trade or investment, and imposing caps on non-resident account balances. In addition, determining minimum holding periods for non-resident investors, or setting limits on capital flows may also be considered. Such restrictions can reduce speculative flows, maintain financial stability, and avoid disruptive withdrawals, while still allowing long-term capital to enter the market.

E. Diversifying and strengthen the investor base

While having foreign investor participation can help develop the government bond market, building a strong and diverse investor base is essential for sustainability of the market. A more balanced mix of both domestic and foreign investors will reduce vulnerability and risk exposures to global financial shocks. A key action that Cambodia's market should include is promoting more openness and providing regulatory reforms and tax incentives to domestic institutional investors such as insurance companies, asset managers and pension fund and retail investors. As suggested by previous studies, a strong and diverse investor base plays an important role in stabilising markets, especially in emerging economies. This insight is highly relevant to Cambodia's market where many of the potential domestic investors remain underemployed. From the survey that MEF conducted with potential investors, institutions such as the National Social Security Fund (NSSF) which holds investible funds, has yet to participate, and at the same time, the market also has yet to tap available long-term funds from insurance companies. Unlocking this domestic capital is an initial step to expand participation and reducing reliance on volatile foreign inflows.

F. Strengthen macroeconomic fundamentals to support investor confidence

Maintaining sound macroeconomic fundamentals is a key indicator in mitigating the risk associated with foreign investors participation in Cambodia's local currency government bond market and building confidence from investors, especially during the global financial shocks. The Cambodian government should pursue price stability and low inflation, while maintaining adequate foreign reserves and a credible monetary policy framework. As indicated by existing studies, the economies with robust macroeconomics are supported by substantial reserves, controlled credit growth and price stability with inflation kept within targeted. Cambodia has made a steady progress by stabilising its exchange rate, building strong foreign reserves, and maintaining a low debt obligation. Continued effort should be put into achieving sound macroeconomic management.

References

Asian Development Bank. (2012). ASEAN+3 bond market guide.

Asian Development Bank. (2013). Broadening the investor base for local currency bonds in ASEAN+2 countries (publication No. RPT15462-2).

Asian Development Bank. (2016). ASEAN+3 bond market guide: Malaysia.

Asian Development Bank. (2016). ASEAN+3 bond market guide: Thailand.

Asian Development Bank. (2017). ASEAN+3 bond market guide 2017: Indonesia.

Asian Development Bank. (2018). ASEAN+3 bond market guide: Viet Nam.

Asian Development Bank. (2021). ASEAN+3 bond market guide: Indonesia update.

Asian Development Bank. (2021). ASEAN+3 bond market guide: Thailand update.

Asian Development Bank. (2023). Support for revenue mobilization—Development of a government bond market and strengthening of subnational revenues (TA 56048-001).

Beirne, J., Renzhi, N., & Volz, U. (2021) Local currency bond markets, foreign investor participation, and capital flow volatility in Emerging Asia. Tokyo

Berensmann, K., Dafe, F., & Volz, U. (2015). Developing local currency bond markets for long-term development financing in Sub-Saharan Africa. *Oxford Review of Economic Policy*.

Committee on the Global Financial System (CGFS). (2007). Financial stability and local currency bond markets. CGFS Paper No. 28. Bank for International Settlements.

Ebeke, C. H., and Lu, Y. (2014). Emerging market local currency bond yields and foreign holdings in the post-Lehman period – A fortune or misfortune? IMF Working Paper No. 14/29. International Monetary Fund.

Ebeke, C. H., and Annette J. K. (2015). Global financial spillovers to emerging market sovereign bond markets. IMF Working Paper 2015/141, June 26. Washington, DC: International Monetary Fund.

Ho, E. (2019). The doubleedged sword of foreign participation in local currency government bond markets. HKMA Research Memorandum RM14/2019. Hong Kong Monetary Authority.

Hong Kong Monetary Authority. (2020). Foreign participation in the local currency bond markets of emerging market economies: Good or bad for market resilience and financial stability?

Law on investment of the Kingdom of Cambodia (2021).

MEF. (2023). Policy framework on the development of government securities 2023–2028.

National Bank of Cambodia. (1997). Law on foreign exchange.

Peiris, S. J. (2010). Foreign participation in emerging markets' local currency bond markets. IMF Working Paper No. 2010/088. International Monetary Fund.

Sienaert, A. (2012). Foreign investment in local currency bonds – considerations for emerging market public debt managers. The World Bank.

Abbreviations

ABO	AsianBondsOnline
ADB	Asian Development Bank
BIR	Bond Investor Registration
BIS	Bank for International Settlements
BNM	Bank Negara Malaysia
BOT	Bank of Thailand
CEIC	CEIC Data (economic and financial database)
CGFS	Committee on the Global Financial System
CSX	Cambodia Securities Exchange
DNDF	Domestic Non-Deliverable Forward
EM	Emerging Market (Economy)
FX	Foreign Exchange
GDICDM	General Department of International Cooperation and Debt Management
IMF	International Monetary Fund
KHR	Khmer Riel
LCBM	Local Currency Bond Market
LCY	Local Currency
MEF	Ministry of Economic and Finance
MLF	Marginal Lending Facility
NBC	National Bank of Cambodia
NBCP	National Bank of Cambodia Platform
NDF	Non-Deliverable Forward
NR	Non-resident
NSSF	National Social Security Fund
OTC	Over The Counter
PFDGS	Policy Framework on the Development of Government Securities
SERC	Securities and Exchange Regulator of Cambodia
SID	Single Investor Identification
STC	Securities Trading Code
USD	United States Dollar
VBMA	Vietnam Bond Market Association
VND	Vietnamese Dong
VNIBOR	Vietnam Interbank Offered Rate
WB	World Bank
WHT	Withholding Tax
YTM	Yield to Maturity