Tun Ismail Ali Chair (TIAC) Webinar

# The U.S. Balance Sheet Policy and Capital Flows: Time-varying Evidence from Emerging Markets

Date: November 7, 2022 | Time: 10:00am | Venue: Microsoft Team

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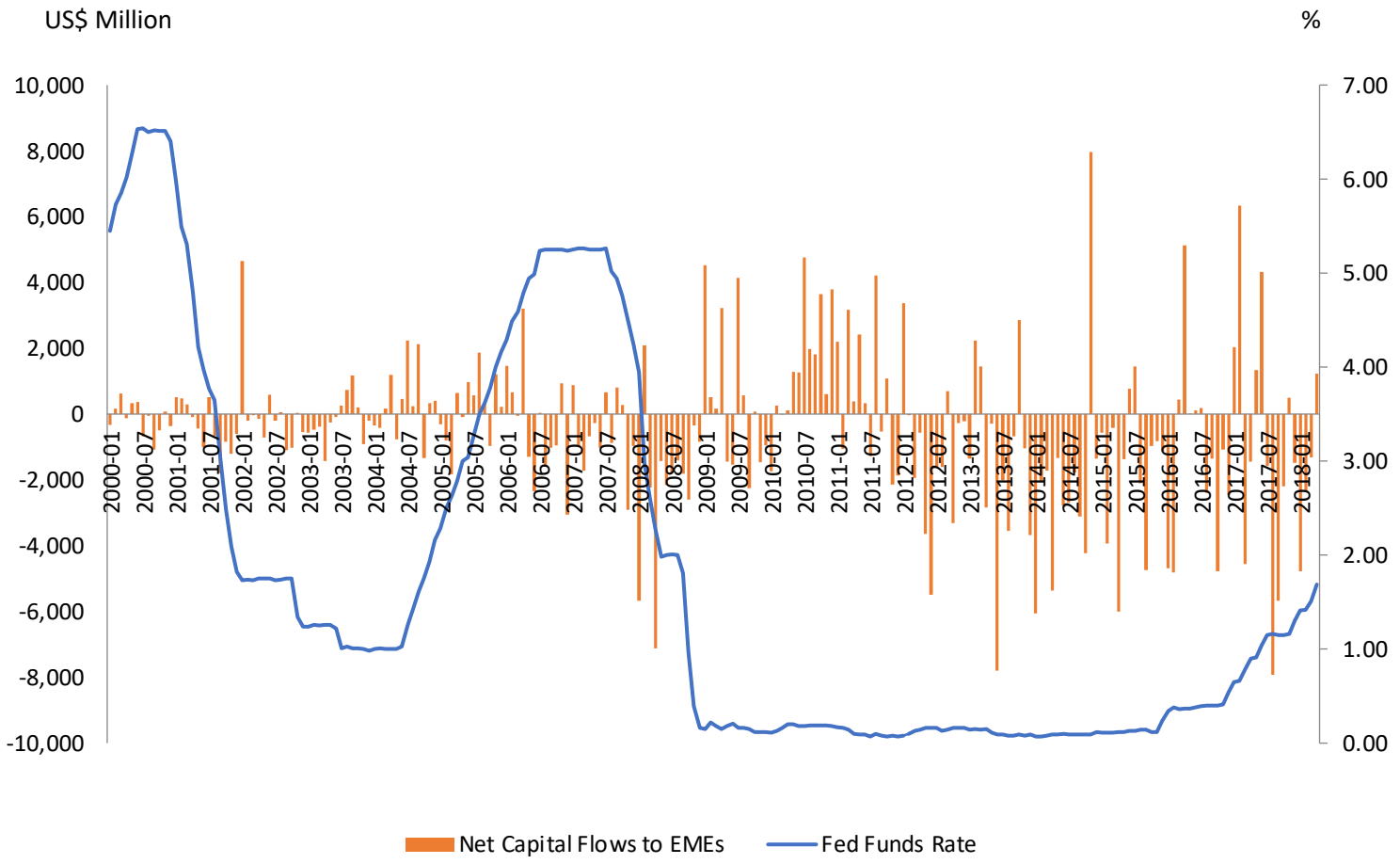
# Introduction

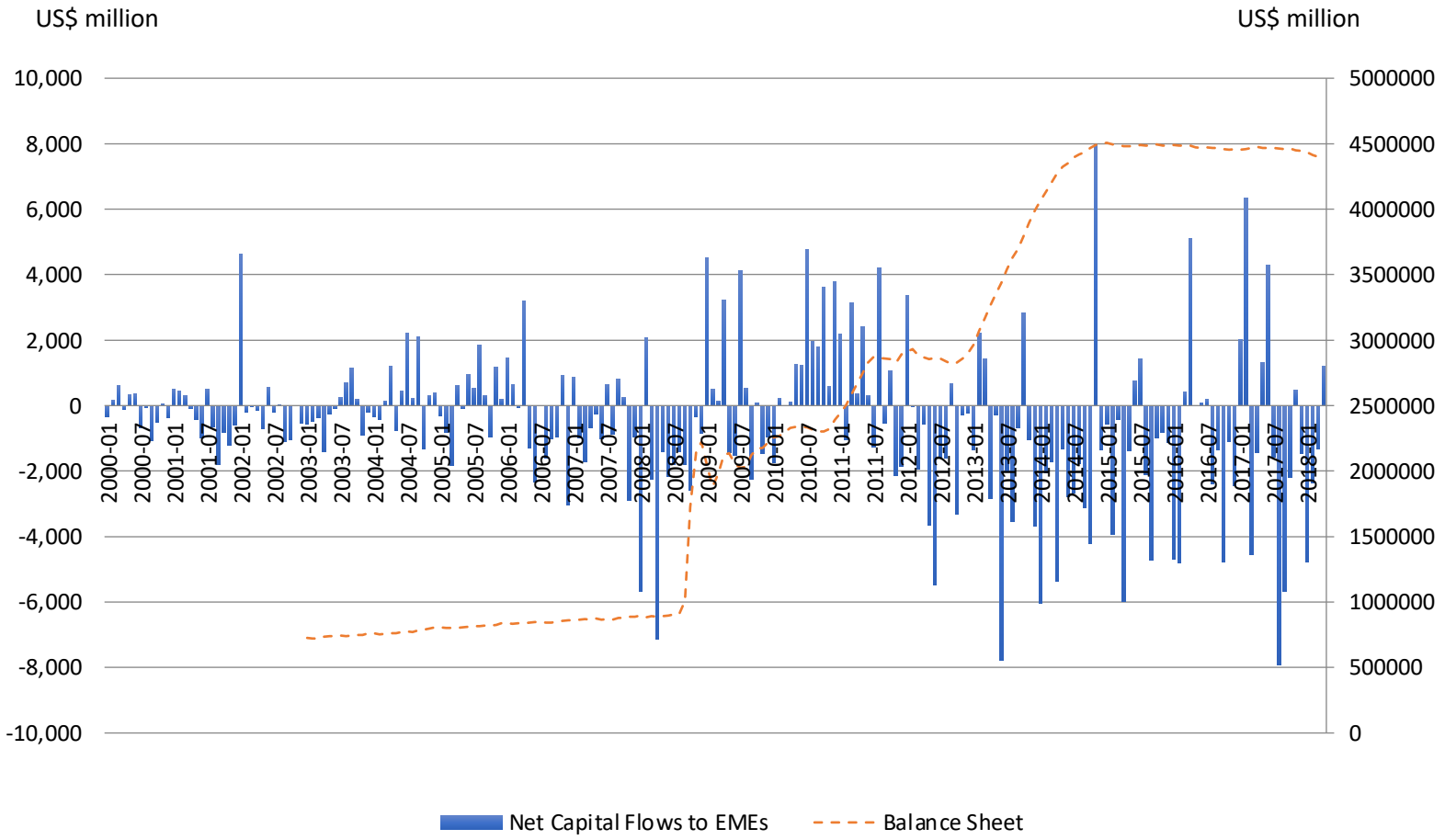
- The rise in capital flows to emerging economies (EMEs) after the global financial crisis of 2008–2009 coincided with the aggressive loosening of monetary policy in advanced economies.

- Recently, concerns were also raised that once monetary policy in the US and other advanced economies began to normalize.

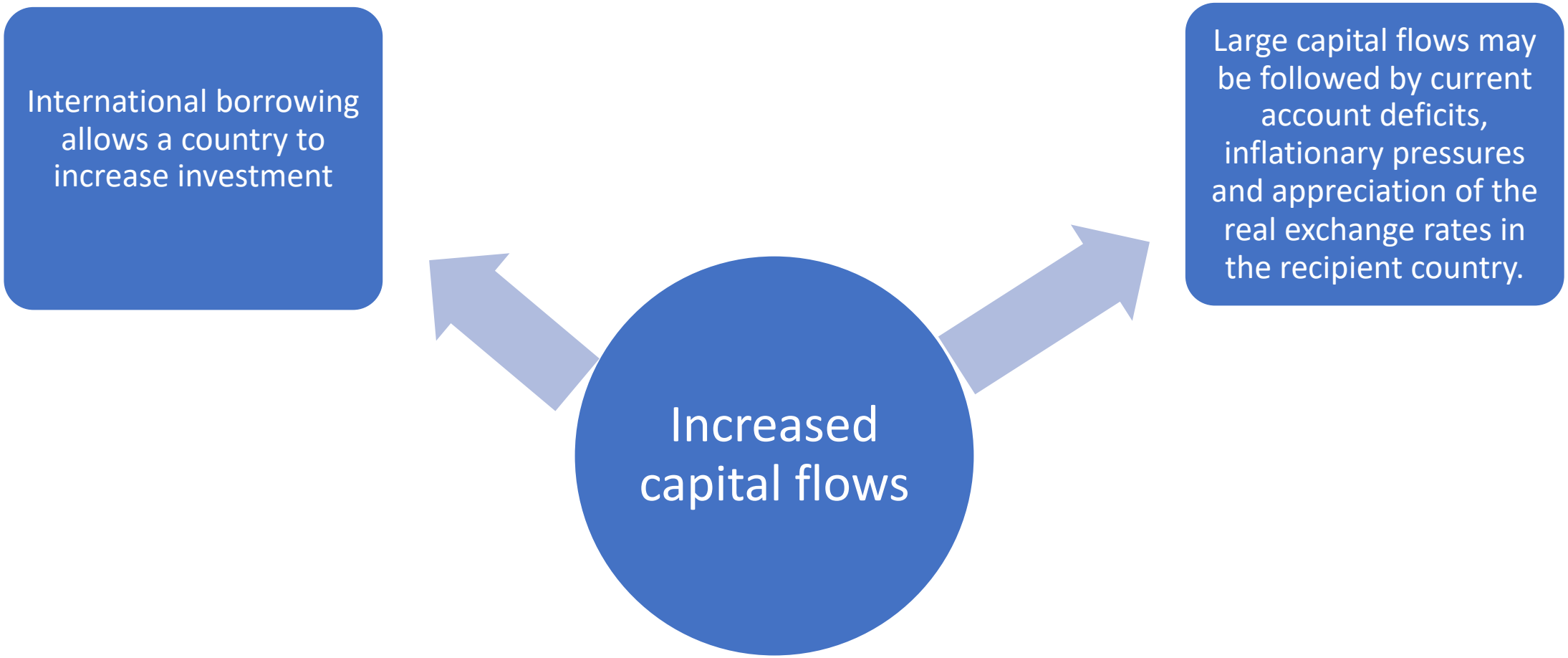
# Figure 1. Net Monthly Capital Flows to EMEs and the Fed's Federal Funds Rate



# Figure 2. Net Monthly Capital Flows to EMEs and the Fed's Balance Sheet Size



# How do capital flows affect EMEs



# Pull Factors vs Push Factors

- Thus, the surge and fall in capital flows have renewed the interest about the key determinants of capital flows.
- This has occurred because of their effects on the real economy, the exchange rate and asset price.
- Pull factors - country specific characteristics
- Push factors - external common conditions

# Contribution to the Literature

- A complication when assessing the relative importance of the drivers of capital flows is that their importance changes over time.
- Although literature indicates that capital flow determinants' influence could shift over time, practically no studies have explicitly estimated the time-varying causal relationship running from US MP to capital flows.
- Understanding how the flows' drivers evolve over time is an original contribution of this paper to the existing body of research.
- It does this by employing a model in which the regression coefficients continuously and endogenously vary over time.

# Objectives of this Research

- In this research, we aim to examine how capital flows to EMEs have changed in relation to the Federal Reserve's balance sheet policy.
- We specifically present a case for the notion that the role of the balance sheet policy has changed over time.

# Why Test for Time-varying Causality?

- The time-varying causality makes a contribution to the investigation of the factors that determine the flow of capital mainly in four different ways:

i. it can endogenously detect the relative importance of the US balance sheet size

ii. it has causal relationships that can shift in a continuous manner.

iii. it facilitates a more accurate quantification of the key drivers.

iv. it is able to identify risks and anomalies

# The Data

- The research uses the monthly data of the size of assets in the Fed's balance sheet, and the amount of capital flows in selected 11 EMEs **(China, India, Indonesia, Malaysia, the Philippines, South Korea, Thailand, Argentina, Brazil, Chile, and Mexico)** from January 2004 to April 2019.
- The Fed's balance sheet is obtained from the Federal Reserve Bank of St. Louise database (FRED).
- The capital flows data are obtained from the U.S. Treasury International Capital (TIC) System.

# The Data

- Net portfolio flows are constructed as the difference between portfolio inflows and outflows.
- While inflows are measured as net purchases and sales of domestic assets (stocks and bonds) by foreign residents,
- Outflows are defined as net purchases and sales of foreign assets (stocks and bonds) by domestic residents.
- Therefore, positive numbers indicate portfolio inflows toward the US or outflows from EMEs.

# Time-Varying Causality

- To allow for time variation in Granger causal orderings and to date-stamp the timing of the changes, recursive estimation methods are required (Shi et al. 2018; Shi et al., 2020).
- There are three algorithms that generate a sequence of test statistics:

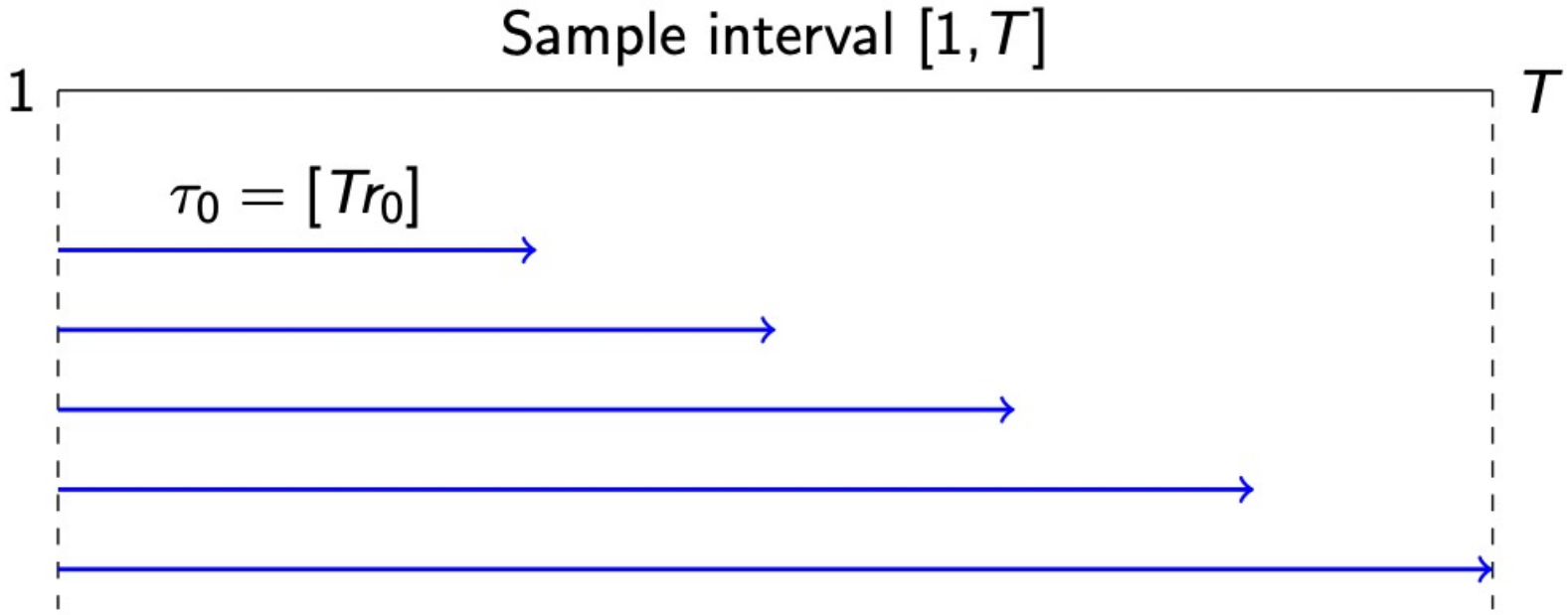
i. the forward expanding (FE) window,

ii. the rolling (RO) window,

iii. the recursive evolving (RE) window.

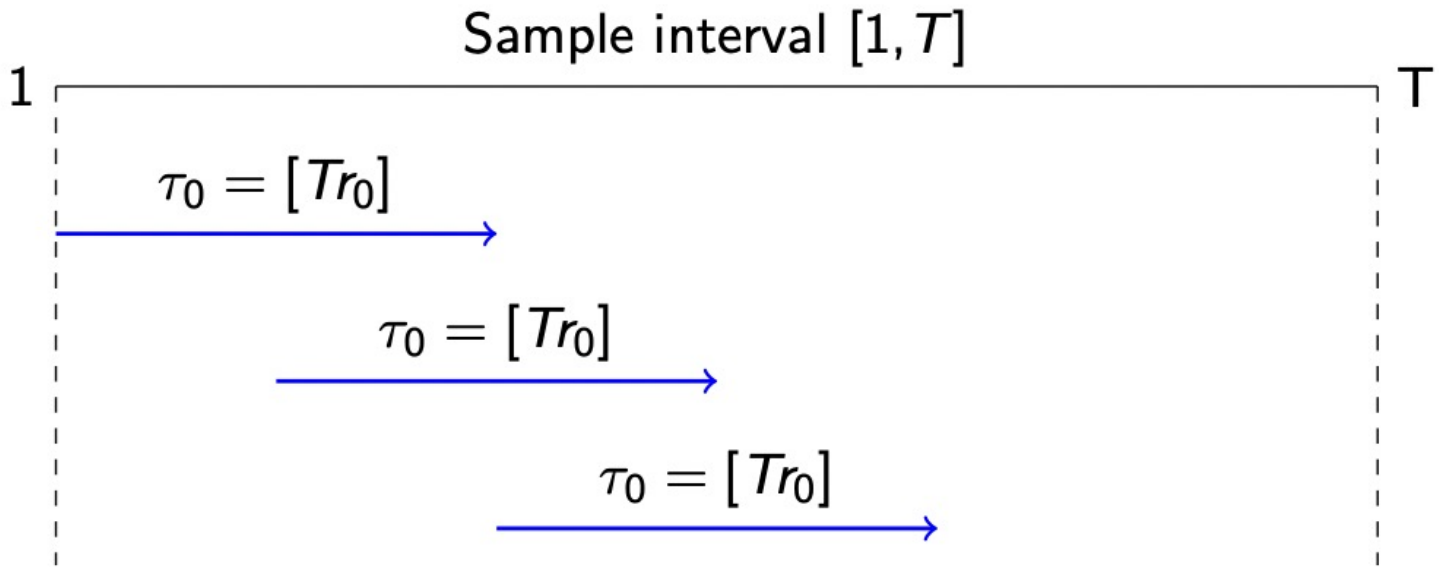
# Time-Varying Causality

Figure 3. Forward Expanding (FE) Window



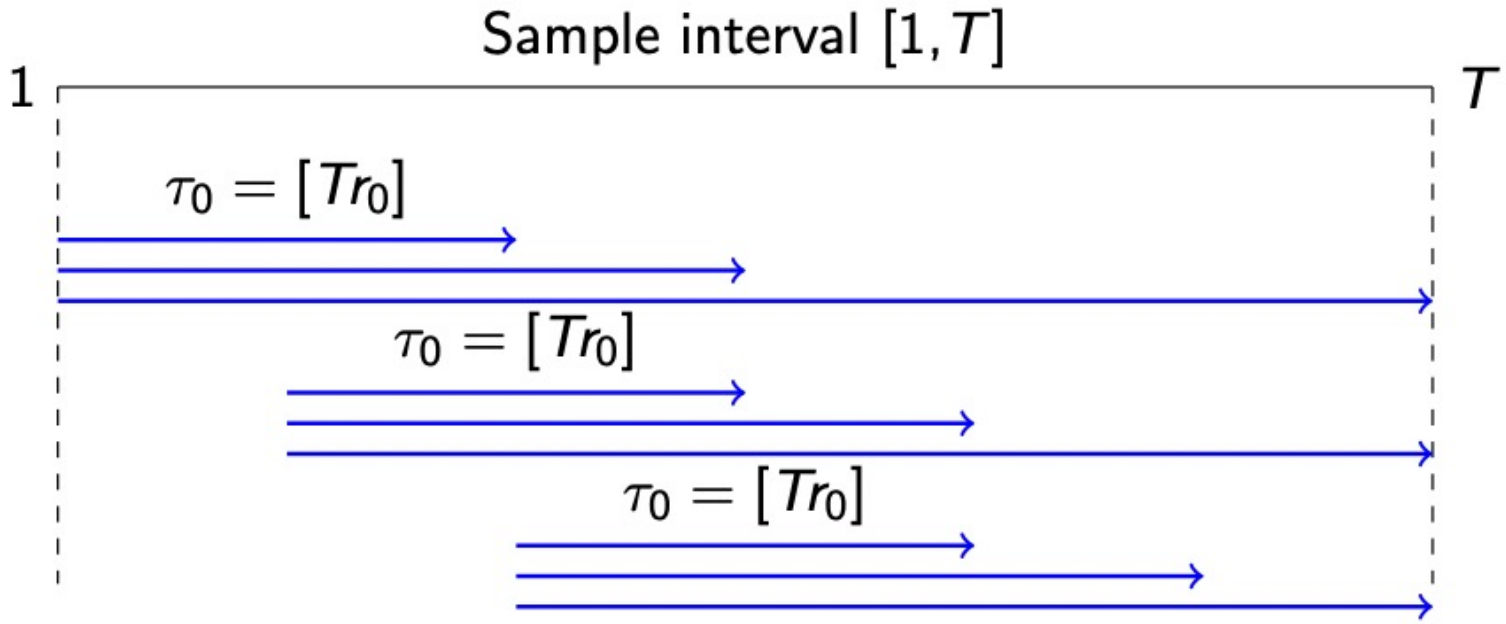
# Time-Varying Causality

## Figure 4. Rolling (RO) Window



# Time-Varying Causality

Figure 5. Recursive Evolving (RE) Window



# Findings: Unit Root Tests

- ADFmax unit root test (Leybourne, 1995)
- DFGLS unit root test (Elliott, Rothenberg, and Stock, 1996).
- The results suggest:

i. presence of a unit root in total asset, and

ii. stationarity of the net capital flows

# Findings: Full Sample Causality Tests

- Toda and Yamamoto (1995) and Dolado and Lütkepohl (1996) recommend estimating a Lag-Augmented VAR (LA-VAR) model to account for the possibility of integrated variables.
- A Lag-Augmented VAR (LA-VAR) model is simply the original VAR(m) model augmented with additional d lags for the possible maximum order of integration of the variables.
- As there is I(1) variable in the VAR model, our analysis proceeds in the context of a LA-VAR model where d = 1.

# Findings: Full Sample Causality Tests

Table 1: Wald Test for Granger Causality Running from US Balance Sheet Size to Capital Flows

| | Max Wald FE | Max Wald RO | Max Wald RE |
|---|---|---|---|
| **Argentina** | | | |
| Bond | 8.913 | 9.671* | 9.985** |
| Stock | 9.694* | 10.422* | 10.836* |
| **Brazil** | | | |
| Bond | 28.177 ** | 28.643 ** | 36.378** |
| Stock | 10.145* | 20.191** | 21.812** |
| **Chile** | | | |
| Bond | 9.507 * | 9.262* | 9.768* |
| Stock | 6.197 | 19.969** | 21.481** |
| **Mexico** | | | |
| Bond | 5.691 | 41.146** | 41.146** |
| Stock | 4.290 | 26.258** | 26.501** |
| **China** | | | |
| Bond | 22.567** | 20.374** | 23.511** |
| Stock | 4.187 | 56.905** | 56.905** |
| **India** | | | |
| Bond | 74.791** | 38.077** | 133.030** |
| Stock | 4.583 | 12.367** | 15.236** |

H0: there is no evidence of Granger causality from balance sheet size to capital flows

Notes: * and ** denote 5% and 1% significance levels, respectively.

# Findings: Full Sample Causality Tests (cont.)

Table 1: Continued

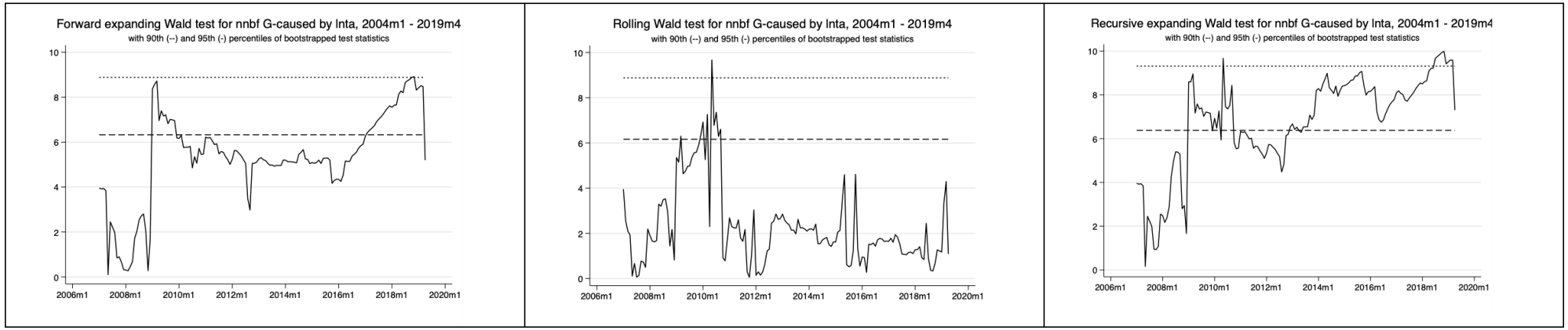
| | | | |
|---|---|---|---|
| **Indonesia** | | | |
| Bond | 20.193** | 20.584** | 20.584** |
| Stock | 15.076** | 36.381** | 38.226** |
| **South Korea** | | | |
| Bond | 59.938** | 59.646** | 81.206** |
| Stock | 11.437* | 14.627** | 23.239** |
| **Malaysia** | | | |
| Bond | 5.703 | 13.339** | 15.863** |
| Stock | 11.977* | 20.250** | 26.463** |
| **The Philippines** | | | |
| Bond | 16.306* | 12.257 * | 20.343** |
| Stock | 17.529 ** | 26.697** | 56.920** |
| **Thailand** | | | |
| Bond | 2.857 | 15.716** | 17.438** |
| Stock | 11.391* | 24.493** | 24.938** |
| | | | |

Notes: * and ** denote 5% and 1% significance levels, respectively.

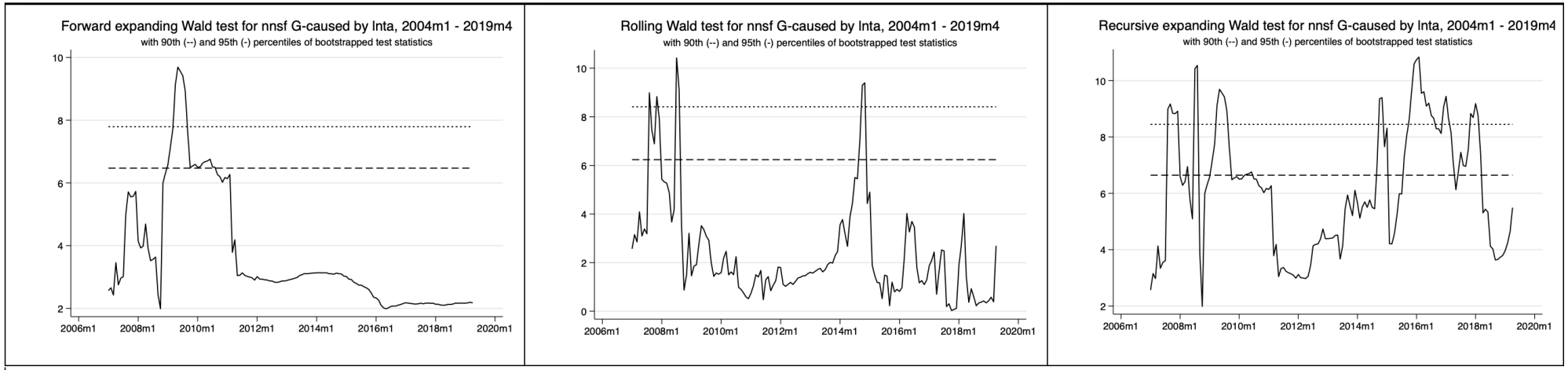
# Findings: Time-Varying Causality

**Argentina**

Bond Flows



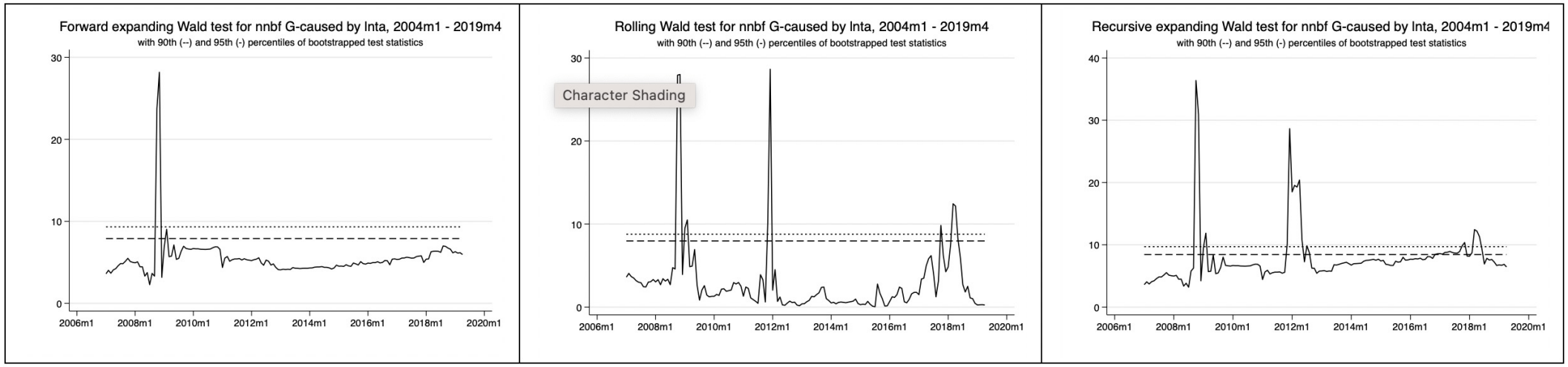

Stock Flows



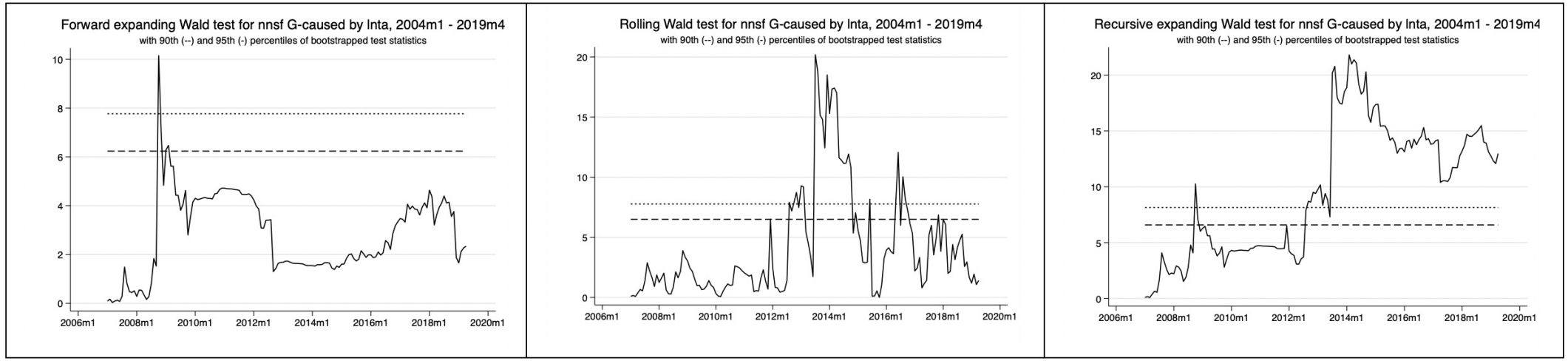
# Findings: Time-Varying Causality

- Brazil

Bond Flows



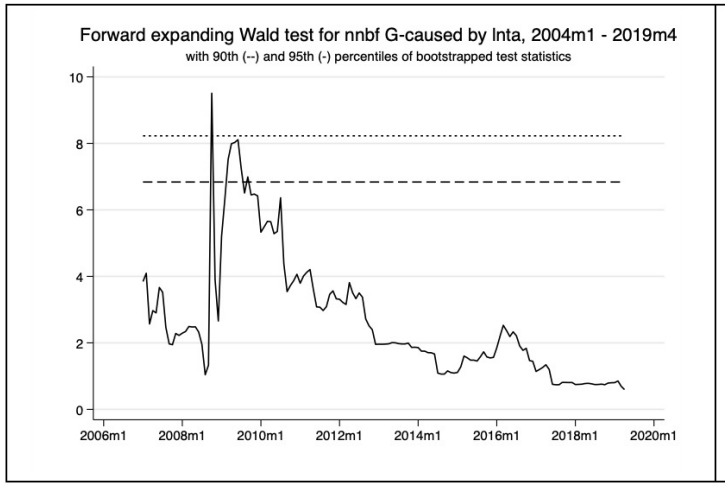

Stock Flows

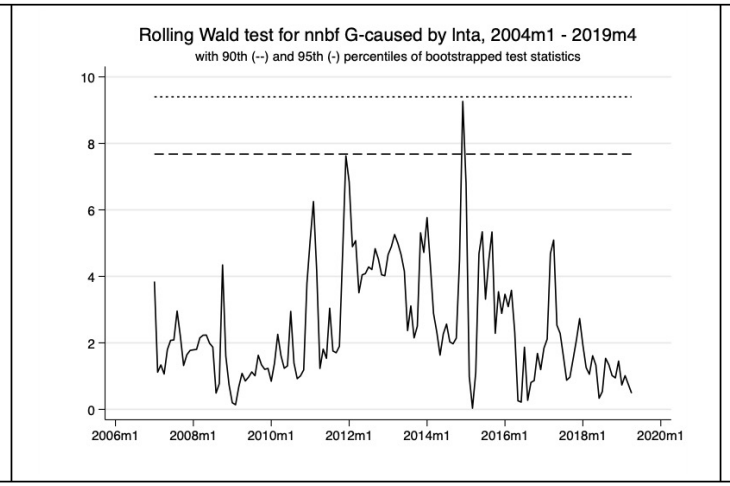


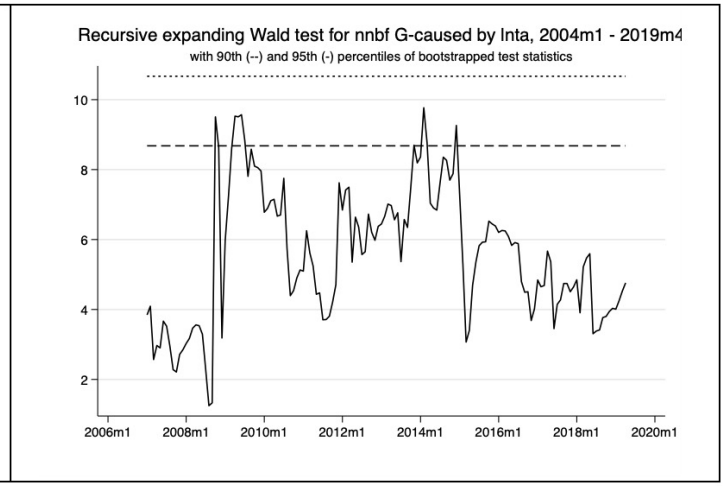
# Findings: Time-Varying Causality

- Chile

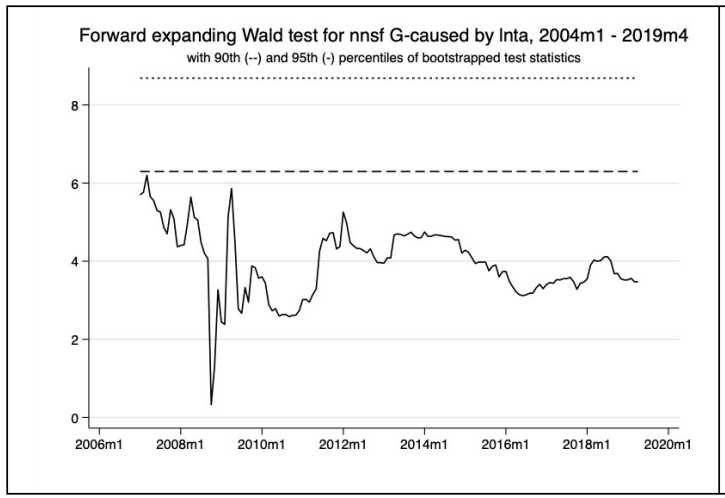
Bond Flows

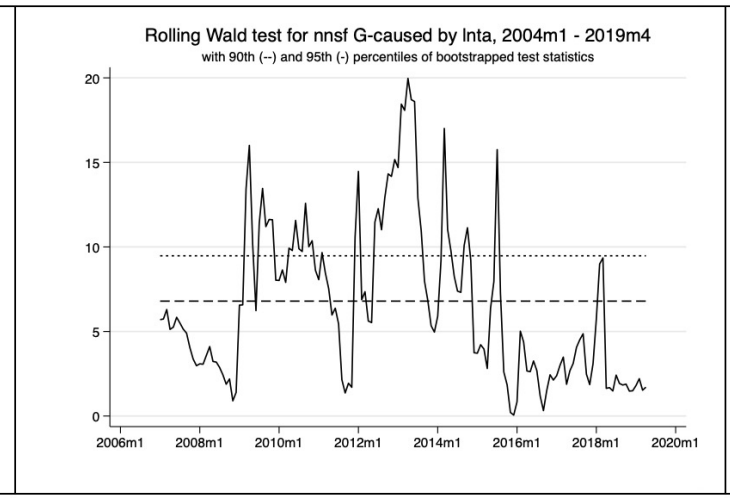


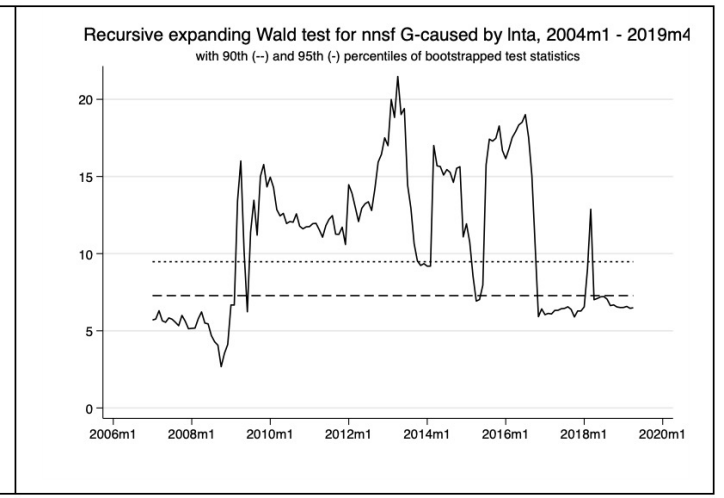




Stock Flows



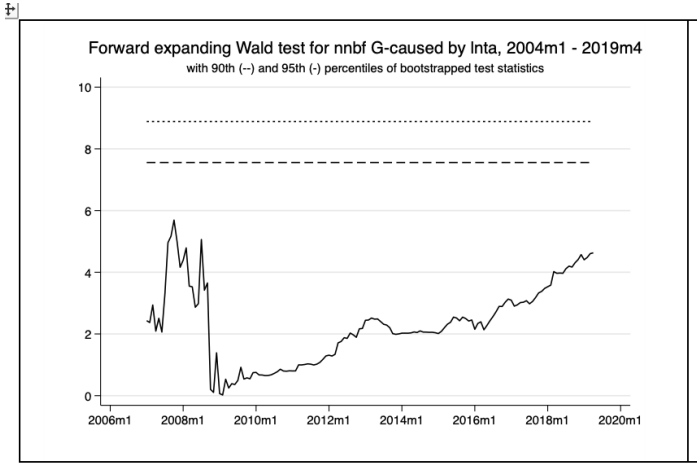



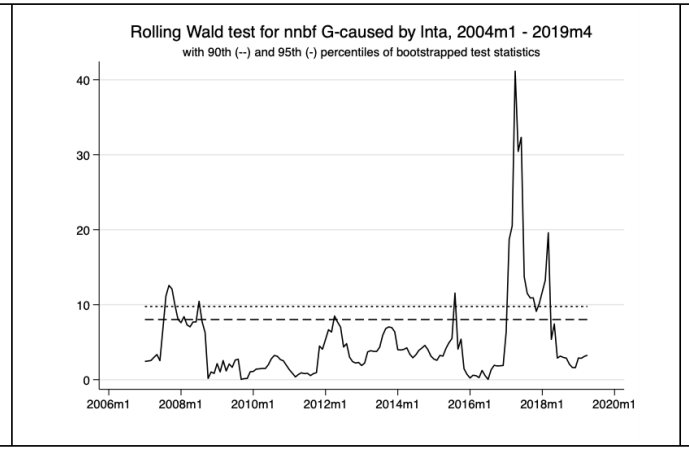



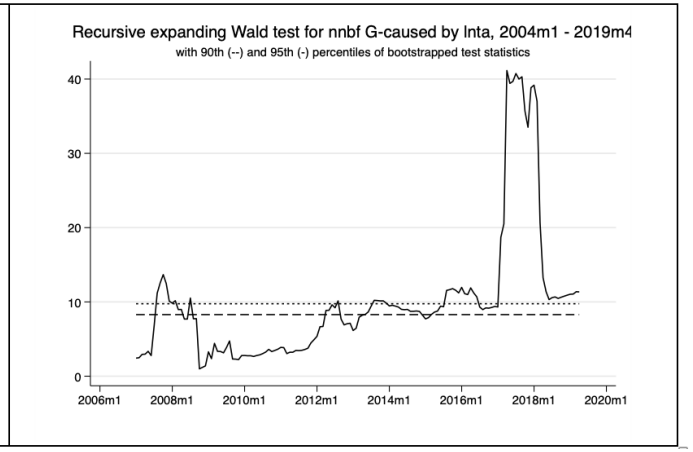
# Findings: Time-Varying Causality

- Mexico

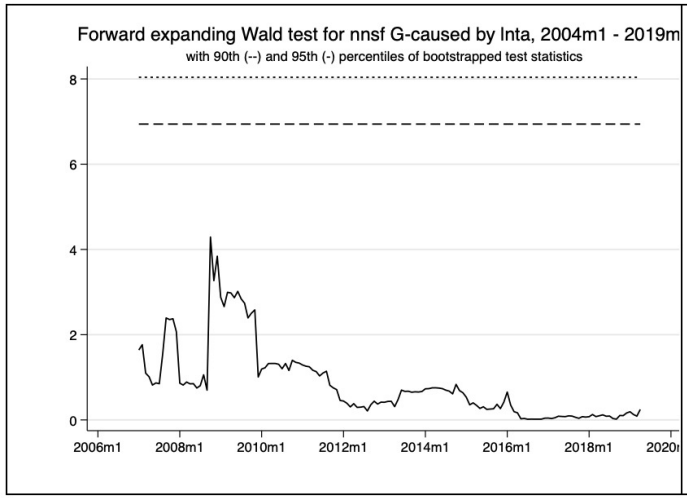
Bond Flows

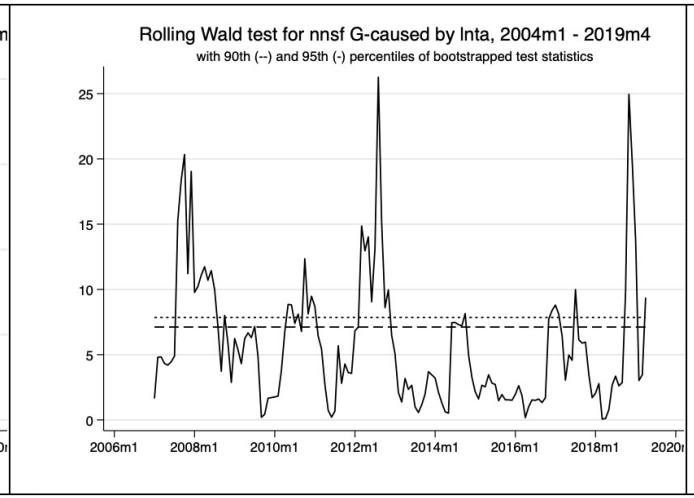


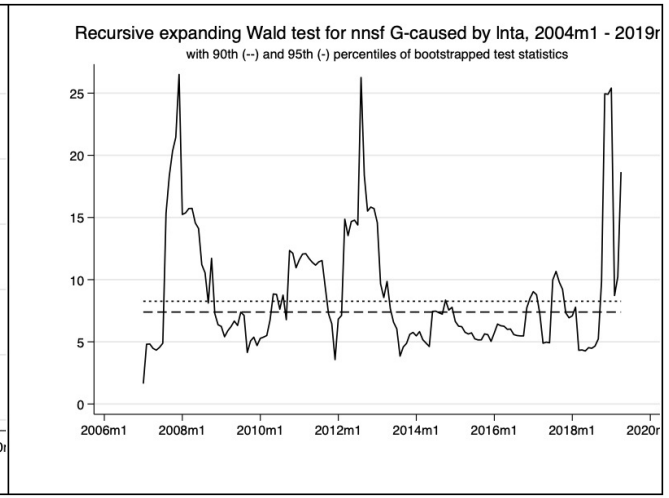




Stock Flows



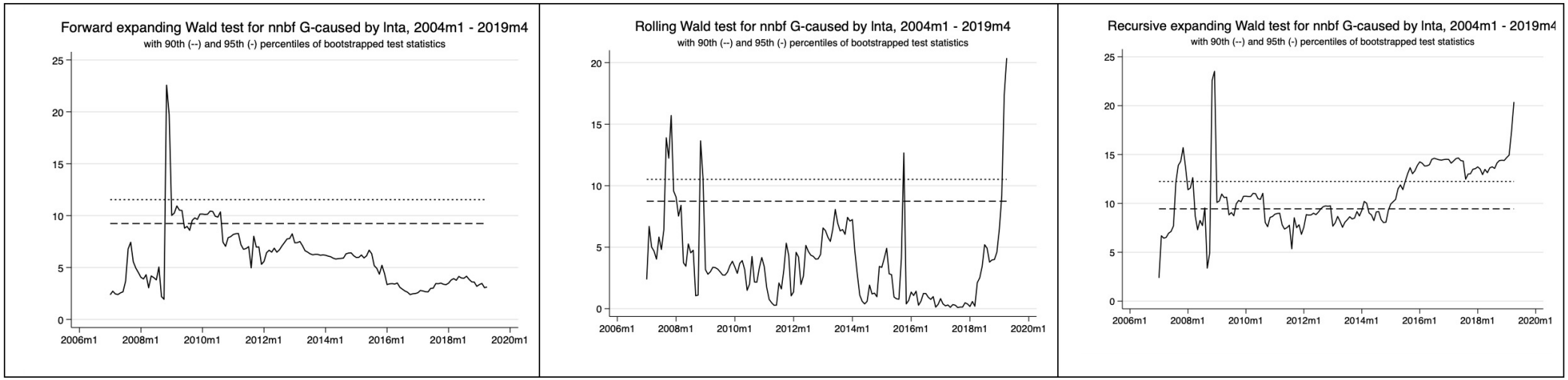



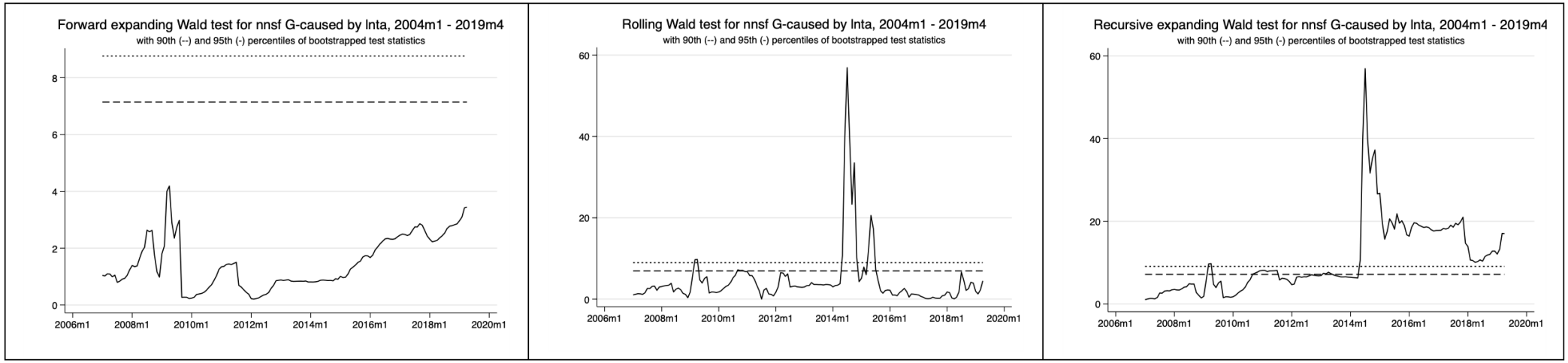
# Findings: Time-Varying Causality

- China

Bond Flows



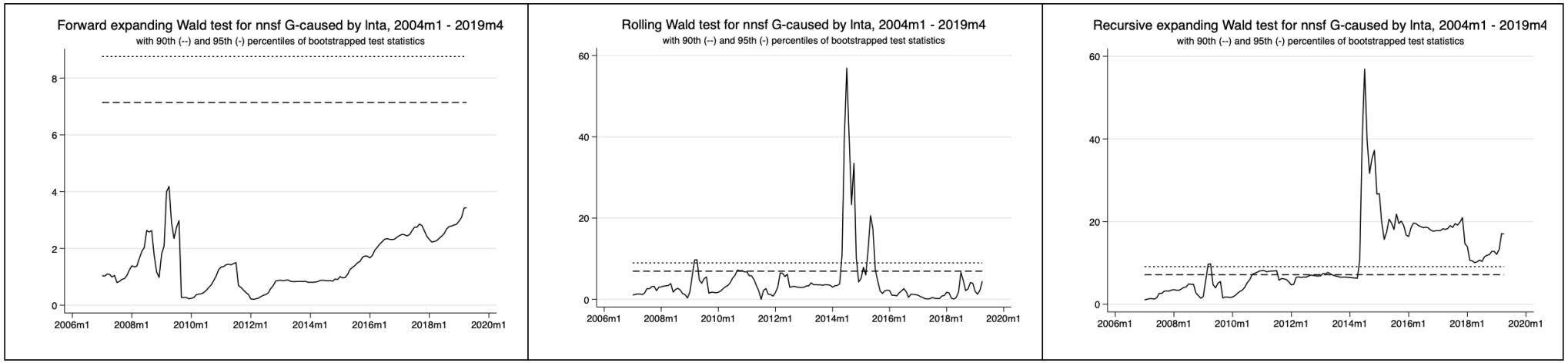

Stock Flows



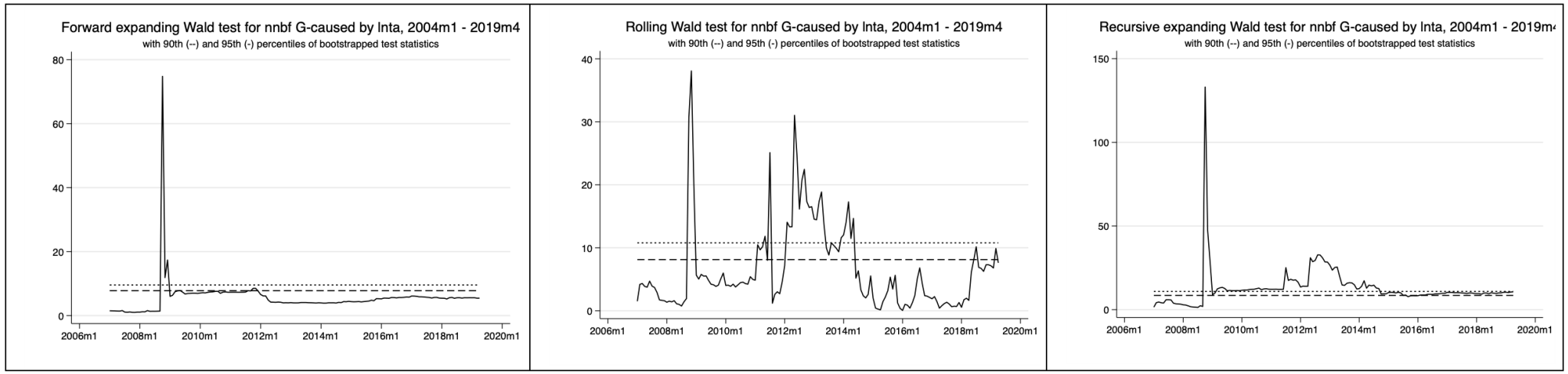
# Findings: Time-Varying Causality

- India

Bond Flows



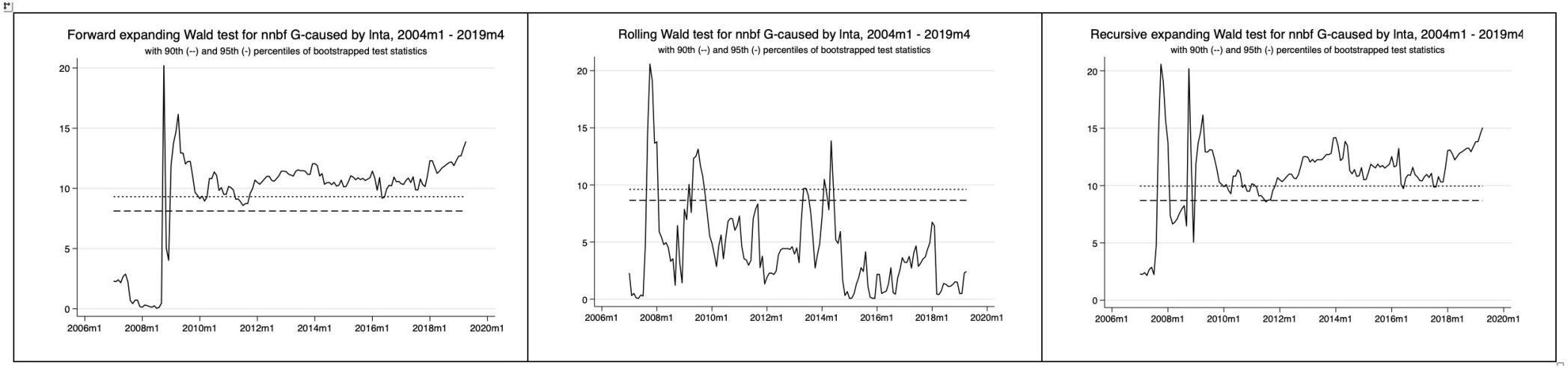

Stock Flows



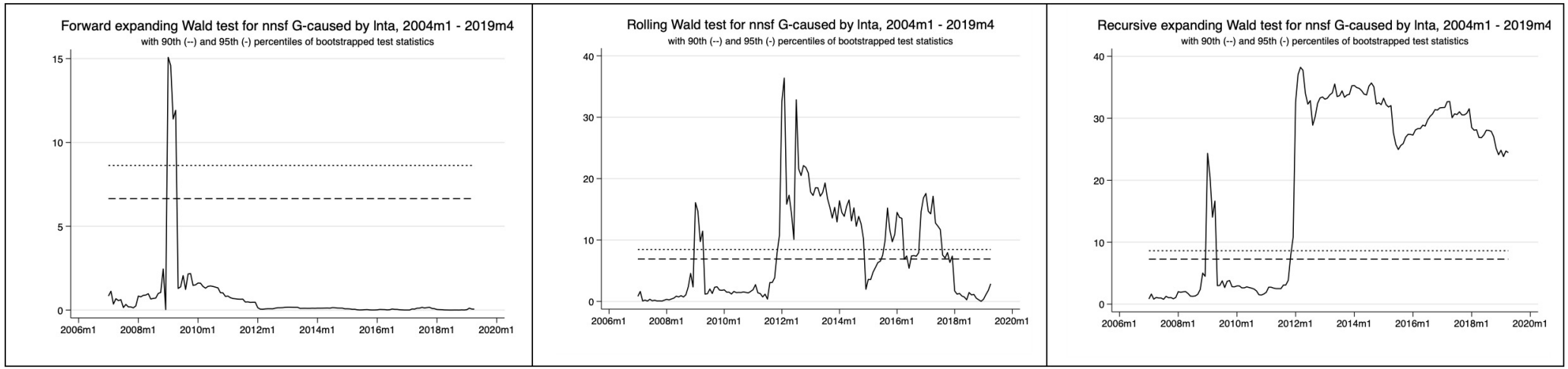
# Findings: Time-Varying Causality

- Indonesia

Bond Flows



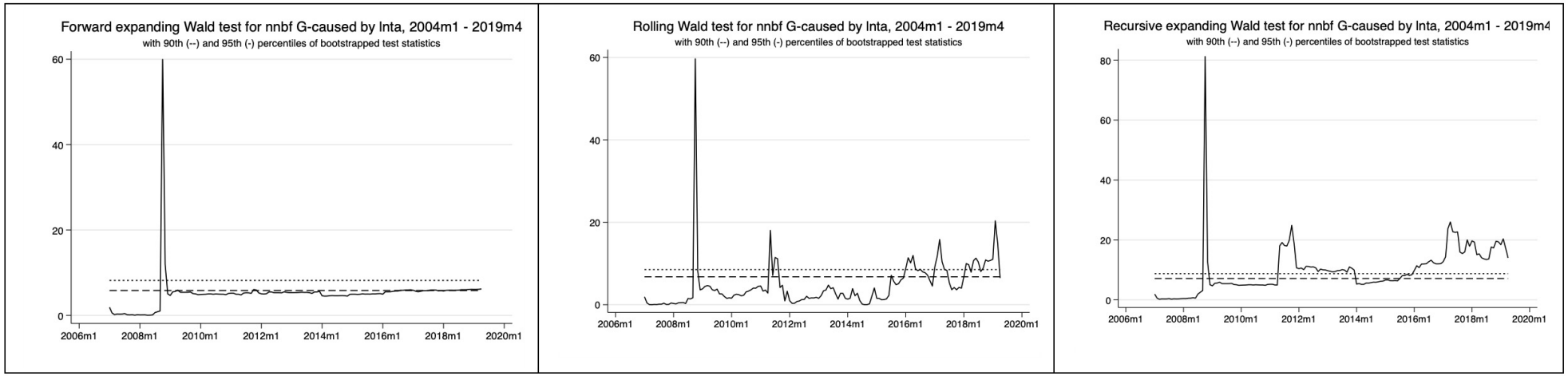

Stock Flows



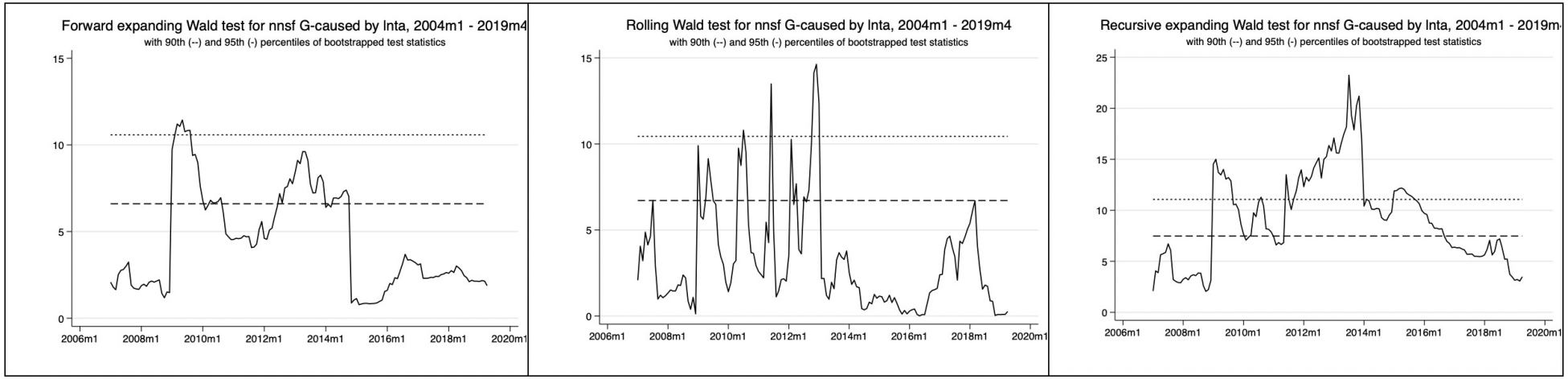
# Findings: Time-Varying Causality

- South Korea

Bond Flows



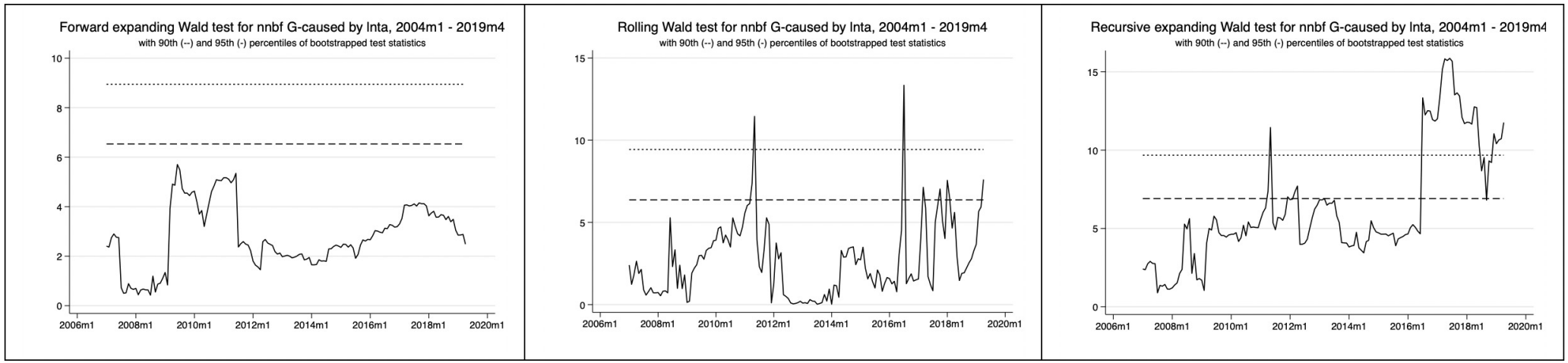

Stock Flows



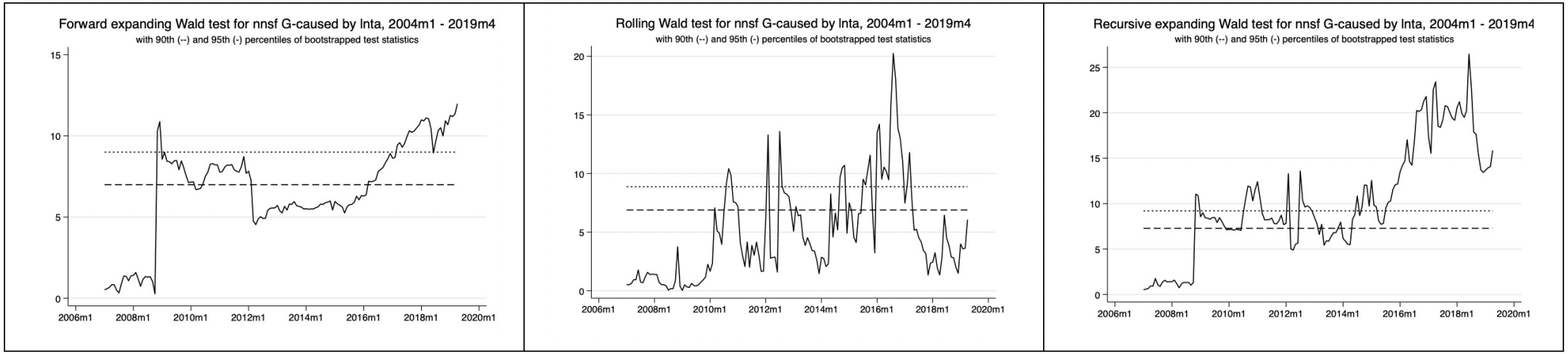
# Findings: Time-Varying Causality

- Malaysia

Bond Flows



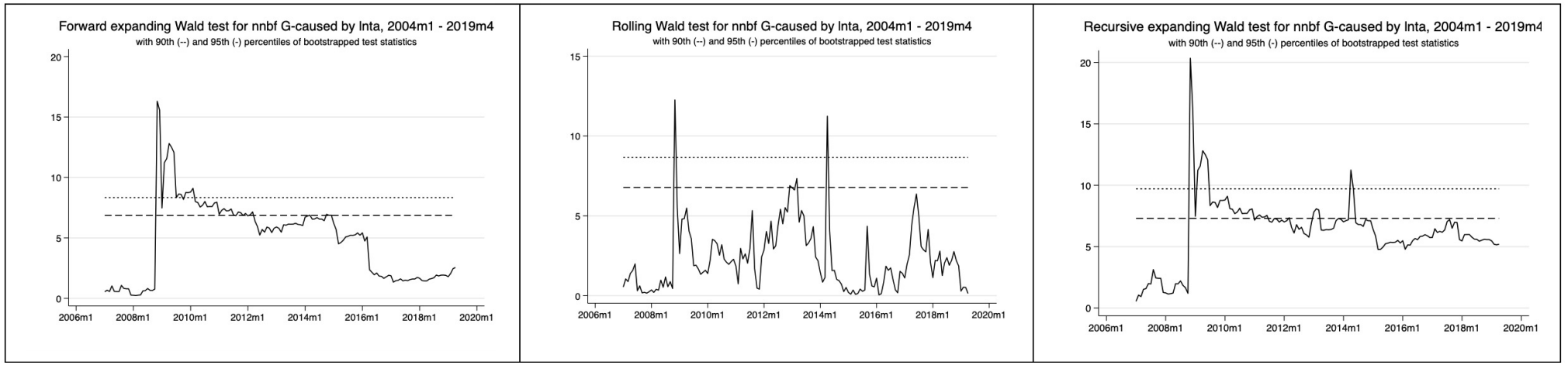

Stock Flows



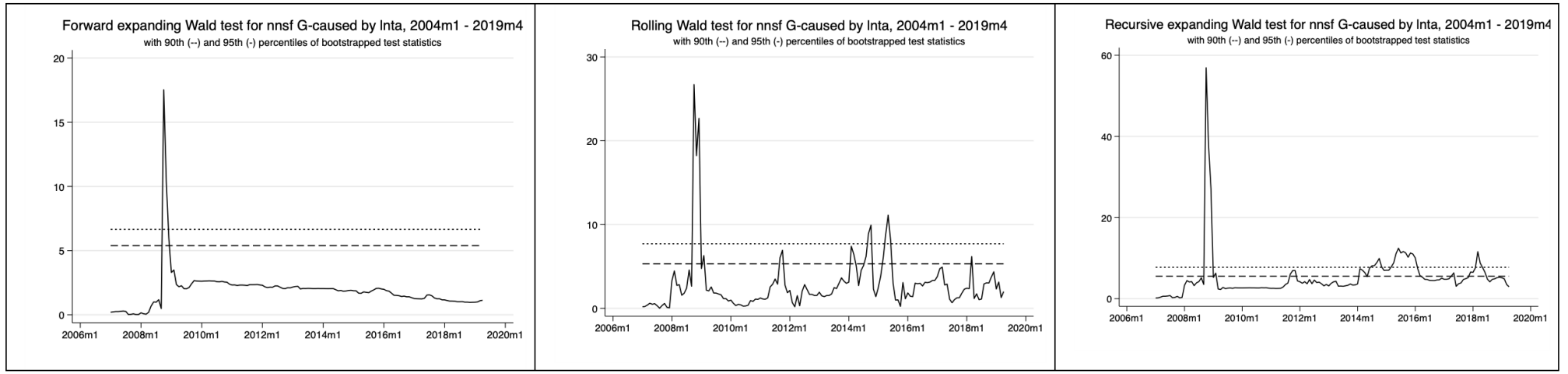
# Findings: Time-Varying Causality

- the Philippines

Bond Flows



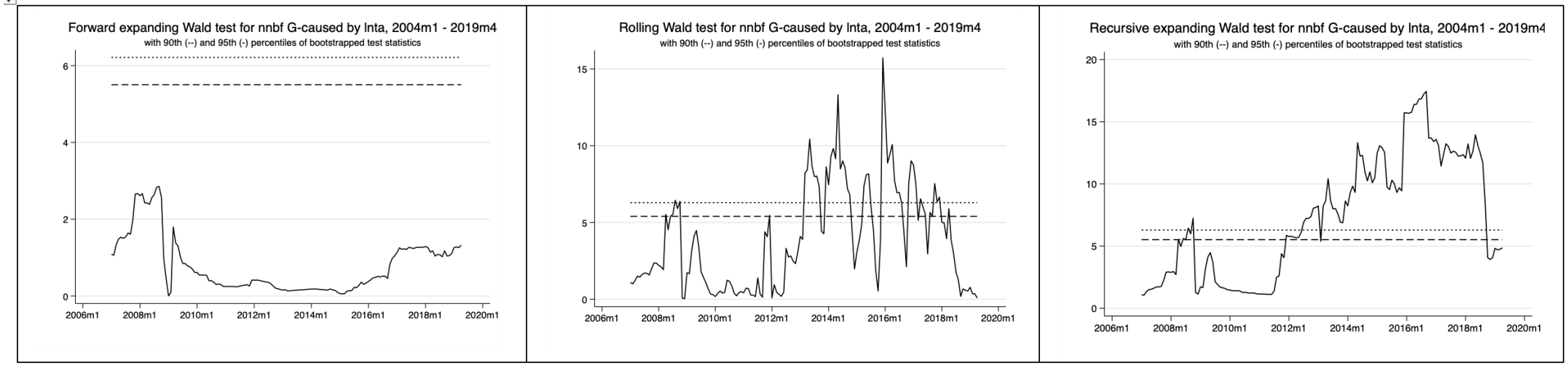

Stock Flows



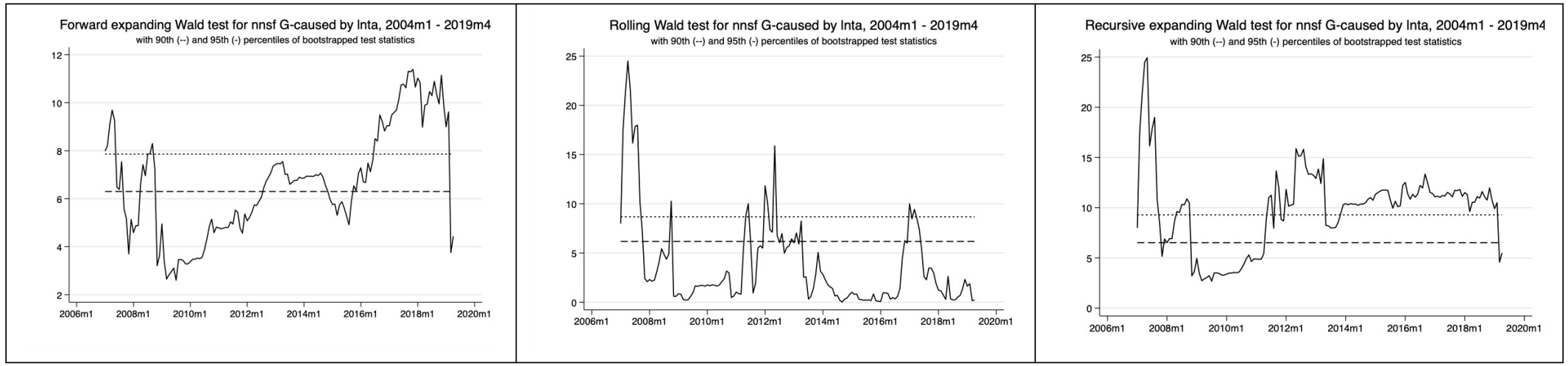
# Findings: Time-Varying Causality

- Thailand

Bond Flows




Stock Flows



# Conclusion

- The findings show significant evidence of time variation in Granger causality running from the size of the US balance sheet to capital flows in EMEs.
- The results show a clear pattern in which the impact of the US balance sheet size on EMEs capital flows appears to be very strong in the latter part of the end of the quantitative easing (QE) stimulus programme.

# Implications

- Understanding the time-varying impact of US balance sheet policy on capital flows is crucial for designing appropriate policies aimed at achieving economic and financial stability in different states of the economy.
- Distinguishing between different types of portfolio flows is also very important, since the US balance sheet policy could have different effects on bond and stock flows.
- One size does not fit all!!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