# Capital Inflow Shocks and Convenience Yields

Nadav Ben Zeev, Noam Ben-Ze'ev, Daniel Nathan

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Monaster Center for
Economic Research
Ben-Gurion University of the Negev
P.O. Box 653
Beer Sheva, Israel

Fax: 972-8-6472941
Tel: 972-8-6472286

# Capital Inflow Shocks and Convenience Yields*


Nadav Ben Zeev†
Ben-Gurion University of the Negev

Noam Ben-Ze'ev‡
Bank of Israel and Ben-Gurion University of the Negev

Daniel Nathan§
Bank of Israel


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**Abstract**

We use novel daily transaction data on Israeli sovereign bonds to identify exogenous inflow shocks from large foreign financial institutions' idiosyncratic trading decisions. These shocks raise short-term convenience yields by up to 8.7 bps, explaining a substantial portion of their variation. We show the effects extend across markets and are amplified through a portfolio rebalancing channel: longer term convenience yields increase by up to 8.1 bps, corporate spreads decline by up to 31.6 bps, and equities rise by 5.7%. Our findings highlight a channel through which global capital flows shape convenience yields, monetary policy transmission, and asset prices.



*JEL classification*: E0,F0,F3,G2

*Keywords*: Convenience Yield; Monetary Policy Transmission; Covered Interest Parity Arbitrage; Capital Inflow Shock; Foreign Financial Institutions; Policy Interest Rates; Market Interest Rates; Portfolio Rebalancing; Granular Instrumental Variable; Slow-Moving Capital



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†Department of Economics, Ben-Gurion University of the Negev, Beer-Sheva, Israel. *E-mail:* nadavbz@bgu.ac.il.

‡Research Department, Bank of Israel, Jerusalem, Israel, and the Department of Economics, Ben-Gurion University of the Negev, Beer-Sheva, Israel. *E-mail:* Noam.ben-zeev@boi.org.il.

§Research Department, Bank of Israel, Jerusalem, Israel. *E-mail:* daniel.nathan@boi.org.il.

# 1 Introduction

The massive growth in cross-border capital flows in past decades has transformed how financial markets function, with foreign financial institutions (FFIs) now wielding unprecedented influence over domestic asset prices and monetary conditions. This influence can manifest through various channels, including convenience yields—the return foregone to hold highly safe and liquid assets. A non-zero convenience yield directly signals imperfect monetary policy transmission. This is because the convenience yield acts as a wedge between risk-free rates devoid of convenience yield (e.g., central bank policy rates) and market rates (which are risk-free but may contain a convenience component). We show that foreign capital inflows themselves can create and sustain convenience yields, independent of other confounding factors such as monetary policy changes, market stress, or fiscal considerations (Krishnamurthy and Vissing-Jorgensen (2012), Nagel (2016), Diamond and Van Tassel (2024), and Jiang et al. (2025)).

Our paper identifies a channel through which global capital flows affect monetary policy transmission in integrated markets. Using granular transaction-level data, we demonstrate that FFIs' demand for sovereign bonds creates persistent wedges between policy and market rates, with significant spillovers across the yield curve and into corporate bond and equity markets. Importantly, we uncover the transmission mechanism driving these spillovers. FFIs' purchase of short-term sovereign bonds prompts local mutual funds, as key counterparties, to reallocate proceeds to riskier assets, amplifying price effects. At the same time, the rise in convenience yields lowers the effective discount rate applied to future cash flows, directly increasing the valuation of risky assets. This portfolio rebalancing, combined with the discount rate channel, completes the transmission from capital inflows to broader asset repricing, revealing how global flows can systematically alter domestic financial conditions (see Figure 1).

While, in theory, any investor's demand could affect safe asset prices, FFIs are uniquely positioned to generate persistent price effects. Foreign inflows can be sizable relative to the scale of the local bond market. These sudden inflows exert significant pressure on bond markets and are difficult to absorb quickly. Together, these features give rise to a distinctive channel of monetary transmission impairment, one that emerges specifically from large-scale, price-making foreign demand.

We begin by presenting novel cross-country evidence that motivates our core hypothesis. Using data for 10 G11 currencies, Figure 2 documents a robust, positive relationship between foreign ownership shares of government bonds and local convenience yields. This pattern holds even after controlling for local bond yields, suggesting that foreign demand for safe local assets can also drive a significant portion of the observed convenience yield. This stylized fact suggests that existing models that stress the well-established relation between safe asset yields and convenience yields (e.g., Nagel (2016) and Diamond and Van Tassel (2024)) may need to be extended to capture a key additional determinant of convenience yields: foreign capital flows.

To rigorously show that foreign capital flows cause convenience yields, we must identify exogenous variation in FFIs' aggregate demand for local sovereign bonds that is uncorrelated with other shifts in demand (e.g., from domestic investors and changes in monetary policy or forward guidance) or supply (e.g., from fiscal considerations). Toward this end, we study Israel's short-term sovereign bond (MAKAM) market, a liquid market in a developed open economy.

Using granular transaction-level data on FFIs' activity in MAKAM, we apply a Granular Instrumental Variable (GIV) approach to identify causal impacts on convenience yields, monetary transmission, and broader asset prices. Findings from Israel—which shares features with other open economies and includes the same major FFIs operating in larger markets—offer insights that extend beyond the local setting. The GIV approach has been extensively used in recent literature to address endogeneity concerns and identify causal effects in various economic contexts (see Gabaix and Koijen (2024)—the developers of this method—and the exhaustive references within as well as Ben Zeev and Nathan (2024a,b)).

The Israeli setting offers two key advantages for applying the GIV approach. First, the market exhibits high concentration: FFIs accumulated substantial positions in the MAKAM market, with trading activity concentrated among a small number of global institutions. This concentration emerged partly due to deviations from covered interest parity (CIP), which made short-term safe assets in many countries, including Israel, attractive for CIP arbitrage strategies (Rime et al. (2022)). These conditions created precisely the environment where GIV proves most effective—one where large players' idiosyncratic investment decisions can significantly move aggregate safe asset demand. Second, our transaction-level data are at a daily frequency and disaggregated by investor identity, which is essential for implementing the GIV methodology and isolating idiosyncratic demand shocks at the investor level. Our identification strategy relies on extracting shocks that are uncorrelated with market-wide conditions. The high-frequency nature of the data reinforces this assumption by reducing the likelihood of coordinated responses to common factors at the daily frequency, allowing us to isolate exogenous variation in aggregate capital inflows into MAKAM and estimate their causal impact on convenience yields.

To measure the short-term convenience yield, we follow the literature and use the overnight index swap (OIS) rate as a measure of the risk-free yield curve (see, e.g., Filipović and Trolle (2013), Infante (2020), Infante and Saravay (2021), Gorton et al. (2022), Fleckenstein and Longstaff (2024), and Jiang et al. (2025)). Accordingly, we define the short-term convenience yield, interchangeably used with 'MAKAM convenience yield' throughout this paper, as the wedge between OIS and MAKAM rates (see Section 3.1.1 for details).[1] To measure the longer term risk-free yield curve, we use interest rate swap (IRS) rates (see Section 4.6 for validation that IRS rates are an appropriate proxy). Therefore, we define the longer term convenience yield, used interchangeably with 'government bond convenience yield' throughout this paper, as the difference between IRS rates and government bond yields.

Our analysis reveals two key findings. First, a 10 percentage point increase in FFIs' accumulated net inflows (as share of total outstanding MAKAM) leads to an 8.7 basis point rise in the MAKAM convenience yield over two years. Second, this effect persists because FFIs gradually build positions over time, creating lasting price effects that weaken the pass-through of policy rates to market rates. This persistence aligns with theories of slow-moving capital where there

[1] van Binsbergen et al. (2022) and Diamond and Van Tassel (2024) put forward a novel method to measure risk-free rates as the implicit risk-free rates—called box rates—from prices of stock market index options. However, the illiquid and short-term nature of the Israeli stock index options market renders this approach unsuitable for our setting. Specifically, as options' maturities for this market are all under three months, even small changes in option prices result in large changes in implied box rates. The standard deviation of our estimated daily box rate series—obtained as medians of maturity-specific estimates from minute-by-minute regressions—was 178 basis points (for a mean of 7 basis points); i.e., our estimated box rate series had an implausibly high coefficient of variation of over 25. This reflects both the short-term nature of the options—which makes the implied box rate highly sensitive to price changes—as well as their illiquid nature as characterized by an average of only 8.7 price quotes (observations) per regression (with a low standard deviation of 5.9).

are institutional constraints on market entrance, such as search costs and time to raise capital (see, e.g., Mitchell et al. (2007) and Duffie (2010)).

Beyond monetary transmission, we document significant spillovers into broader financial markets due to the capital inflow shock. Government bond convenience yields rise by up to 8.1 basis points, with the effects decreasing along the yield curve. Corporate bond yields consist of three components: the risk-free rate plus liquidity and risk premiums. Corporate spreads are measured by the difference between corporate bond yields and IRS rates, and thus contain both a liquidity premium component and a risk premium component. We find that these spreads decline by as much as 31.6 basis points in response to our capital inflow shock. The effects extend to equity markets, where the local stock index rises by 5.7%. These spillovers suggest that FFI-driven changes in the benchmark safe asset rate lead to a broad repricing of other assets.

These spillovers are amplified through financial markets via a portfolio rebalancing mechanism. Using novel daily secondary market data, disaggregated by sector, we show that mutual funds act as key counterparties to FFIs' MAKAM purchases, reallocating proceeds into government bond, corporate bond, and equity investments. This provides direct evidence that capital inflow shocks trigger local portfolio adjustments, amplifying their impact beyond the short-term sovereign bond market. The specific and unique role we find for mutual funds in this rebalancing echoes the similar role found for these institutions in amplifying the effects of quantitative easing in the U.S. (Selgrad (2023) and Acharya et al. (2025)) and euro area (Breckenfelder and De Falco (2024)).

Our findings have important implications for both policymakers and market participants. For central banks, the results underscore how capital flows can impair monetary transmission by creating persistent wedges between policy rates and market rates. This suggests central banks need to develop frameworks for monitoring foreign positioning in sovereign markets as a key factor in assessing monetary transmission effectiveness, as large inflows can create persistent divergences between intended policy stance and market outcomes. For investors, our findings demonstrate that sovereign bond yields can deviate persistently from levels implied by risk-adjusted return expectations, driven by institutional demand imbalances. This insight is crucial for understanding price formation in sovereign bond markets and suggests traditional yield curve models need to incorporate the growing influence of foreign capital flows on convenience yields.

**Literature Review.** Our paper connects to four strands of literature. The first is the literature on convenience yields of safe assets, which has predominantly centered on the U.S. (Krishnamurthy and Vissing-Jorgensen (2012), Nagel (2016), Lenel et al. (2019), Koijen and Yogo (2020), Infante (2020), Infante and Saravay (2021), van Binsbergen et al. (2022), Gorton et al. (2022), Doerr et al. (2023), D'avernas and Vandeweyer (2024), Fleckenstein and Longstaff (2024), and Jiang et al. (2025)), with recent papers focusing also on other developed economies' convenience yields (Du, Im and Schreger (2018), Jiang, Lustig, Van Nieuwerburgh and Xiaolan (2021), and Diamond and Van Tassel (2024)). While this literature has mostly focused on monetary policy, market stress, and fiscal considerations as drivers of convenience yields, we put forward a new convenience yield channel based on foreign demand for local safe assets.

The second literature examines how foreign investors affect domestic asset prices and market functioning. Jotikasthira et al. (2012) documents how foreign fund flows create significant price pressure in emerging market stocks, while Pandolfi and Williams (2019) shows substantial effects on emerging market sovereign yields. These price effects often extend beyond the directly affected markets—Fratzscher et al. (2018) demonstrates how U.S. monetary policy drives foreign flows that create substantial cross-market spillovers. We contribute to this literature by providing new evidence on the role of FFIs as price-makers in sovereign bond markets.

The third literature studies covered interest parity (CIP) deviations, which Du, Tepper and Verdelhan (2018) shows to be persistent post-GFC. These deviations affect financial markets through multiple channels: Ivashina et al. (2015) demonstrates impacts on global banks' cross-currency lending, Avdjiev et al. (2019) links them to bank leverage decisions, and Anderson et al. (2024) shows how they reshape banks' business models toward arbitrage-driven liquid asset investment. While pre-GFC FX swap supply was perfectly elastic with CIP-determined pricing, post-GFC regulatory constraints create persistent arbitrage opportunities (Du and Schreger (2022)). We extend this literature by showing how FFIs arbitrage activities affect monetary policy transmission through sustained distortions in market rates.

The fourth literature our paper connects to is the extant literature investigating the many ways in which intermediaries affect financial markets (Greenwood and Vayanos (2010), Ellul et al. (2011), He and Krishnamurthy (2013), He et al. (2017), O' Hara et al. (2018), He and Krishnamurthy (2018), Klingler and Sundaresan (2019), Hendershott et al. (2020), Jiang, Krishnamurthy and Lustig (2021), Koijen and Yogo (2022), Greenwood et al. (2023), Pinter (2023), and Ben Zeev and Nathan (2024a,b) among others). We add to this literature by showing how large net capital inflows from FFIs—driven by their demand for short-term risk-free bonds—affect monetary policy transmission impairment.

**Outline.** The remainder of the paper is organized as follows. Section 2 provides a brief summary of the institutional background of FFI activity in the MAKAM market. Section 3 provides a description of the data and methodology used in this paper. Section 4 presents the baseline results, briefly discusses additional robustness checks, and reinforces the validity of our IRS rates as measures of the longer term risk-free yield curve. Section 5 concludes.

# 2 Institutional Background

FFIs are global financial intermediaries, including commercial banks, investment banks, hedge funds, and asset managers, that pool funds from various investors and invest it across financial assets. MAKAM are short-term zero-coupon sovereign bonds issued by the Bank of Israel (BOI) to large primary dealers with 3- or 12-month maturities. They are issued monthly, resulting in 12 concurrently traded series, each with a term of up to 1 year—stressing its highly liquid and safe nature, which makes MAKAM very appealing to FFIs' CIP arbitrage activity.

MAKAMs exhibit superior liquidity compared to government bonds (3.3 times the trading volume and 40% tighter bid-ask spreads) and preferential regulatory treatment under Basel III relative to bank deposits. These advantages render MAKAMs particularly attractive for cross-border flows. By the end of our sample, FFIs had accumulated a 50% share of outstanding MAKAM, with trading activity highly concentrated among a small number of global institutions (Herfindahl–Hirschman index of 0.47). See Online Appendix A for more institutional details.

A natural question arises: why isn't the supply of risk-free bonds perfectly elastic? Online Appendix C presents a simple model with broad external validity beyond our empirical setting of central bank securities, where constraints on security issuance by a sovereign (be it a government or a central bank) result in an imperfectly elastic supply curve and the emergence of increased convenience yield in the presence of large capital inflow shocks. We argue that this convenience yield mechanism is the main driver behind the rise in MAKAM convenience yields—from effectively zero before 2021 to an average of 25.3 basis points thereafter.

# 3 Methodology

This section elucidates the methodology used in the empirical analysis undertaken in this paper. We first describe the data used in the estimation, and then present the estimation approach.

## 3.1 Data

We use daily data that span the period 1/1/2017–8/31/2022. The specific start and end dates of this roughly six-year period are dictated by the availability of the BOI proprietary data we have on FFI MAKAM flows. We begin our data description by providing details on FFI data, after which we discuss the other variables in our empirical analysis.

### 3.1.1 MAKAM Convenience Yield and FFIs' MAKAM-Related Net Capital Inflows

**MAKAM Convenience Yield.** Our main object of interest is the MAKAM convenience yield. To measure it, we turn to OISs, which are nearly risk-free derivatives, and thus well-suited for constructing the risk-free yield curve (see, e.g., Filipović and Trolle (2013), Infante (2020), Infante and Saravay (2021), Gorton et al. (2022), Fleckenstein and Longstaff (2024), and Jiang et al. (2025)).

OIS rates for our sample are available only for 1- and 3-month maturities. They are equal to the 1- and 3-month Israeli interbank rate (TELBOR), because BOI regulation obligates local banks to use TELBOR rates as the fixed rates underlying OIS transactions. The overnight reference rate underlying OISs is the overnight TELBOR rate, which has a correlation of effectively 1 with the overnight risk-free rate from BOI deposit auctions—precisely, 0.999989 in levels and 0.999032 in first-differences.

To anchor longer TELBOR rates to the shorter-term OIS rates, i.e., to impose on longer TELBOR rates to reflect the risk-neutral expectation of overnight risk-free rates, the BOI's regulation also obligates local banks to use 6-, 9-, and 12-month TELBOR rates as the fixed rates in forward rate agreement (FRA) transactions, where the floating rate is the 3-month OIS rate. In this way, the BOI ensures that longer TELBOR rates are also effectively indexed to the risk-free overnight rate. We exploit this institutional setting to measure the short-term convenience yield by subtracting MAKAM rates from TELBOR rates from the 1- to 12-month maturities.

Both MAKAM and TELBOR rates are computed by averaging across the 1-12 month maturity rates. The 1-, 3-, 6-, 9- , and 12-month TELBOR rates are from the BOI; the other rates are interpolated from the observed rates.

**FFI-Level MAKAM-Related Net Capital Inflows.** We have proprietary daily transaction-level data for FFIs' net capital inflows from MAKAM-related activity. We observe all MAKAM-related FFI Israeli shekel (ILS) flows settled at their ILS checking accounts with local banks.[2] Hence, an FFI's gross capital inflow (outflow) is defined as the debiting (crediting) of its account with a local bank resulting from MAKAM purchasing (selling or redemption) activity, and its net capital inflows are the difference between its gross inflows and outflows. MAKAM gross capital inflows include purchases in both the primary and secondary markets. Access to both primary and secondary market flows is crucial, because each captures a distinct and important share of FFI capital inflows into the MAKAM market.[3]

We have a total of 18 FFIs, which correspond to the universe of FFIs active in the MAKAM market. The aggregate daily FFI net capital inflows variable is the sum of the individual 18 FFIs' daily net capital net inflows.

[2] Some of FFI activity is through a foreign custodian bank, which is not an investor in MAKAM but rather serves only as a vehicle for transaction settlement. Hence, we cannot observe such custody-based flows as these flows are not settled directly by FFIs but rather by said foreign custodian through its checking account with local banks. Online Appendix D.4 confirms that our baseline results are unaffected by this unobserved custody-based activity, by directly controlling for this foreign custodian's flows in our FFI-level regressions.

[3] FFIs generate a major part of their MAKAM demand through placing direct purchase orders with local banks prior to MAKAM auctions, with primary-market-related purchases constituting 49.8% of FFIs' total purchases. Our net capital inflow data captures these important demand flows.

## 3.2 Additional Local Interest Rates

**Local Government Bond Yields and Swaps Rates.** To show our short-term convenience yield mechanism also spills over to the local government bond market—which is longer term in nature, we examine the responses of spreads between longer term risk-free rates measures and government bond yields for the 1- through 5-year and 10-year maturities—i.e., these spreads constitute government bond convenience yields.

Government bond yields are available from the BOI. To measure the longer term risk-free yield curve, we use interest rate swap (IRS) rates for the 1- through 5-year and 10-year maturities (see Section 4.6 for validation), subtracting them from the corresponding government bond yields to control for maturity-comparable risk-free rates. IRS rates, which are taken from Reuters, are the fixed interest rates from IRS contracts—i.e., agreements exchanging fixed-rate interest payments for floating-rate ones—traded by commercial banks who in turn serve as market makers in the local IRS market.

Since IRS rates are only available for the 1- through 5-year maturities and 7- and 10-year maturities, and due to government bond illiquidity for the 6- through 9-year maturities which in turn produces many missing observations for these maturities, we show results for the government bond spreads data for the 1- through 5-year maturities and the 10-year maturity (omitting the 7-year maturity).

**Local Corporate Bond Yields.** Corporate bond yields can be decomposed into the sum of the risk-free yield and liquidity and risk premia (Jiang, Lustig, Van Nieuwerburgh and Xiaolan (2021)):

$$corporate\_yield_t = risk\_free\_yield_t + liquidity\_premium_t + risk\_premium_t. \tag{1}$$

To asses whether our capital inflow shock also affects the corporate bond market, we examine the responses of the spreads of nominal investment-grade corporate bond yields for the 1- through 5-year and 7- and 10-year maturities with respect to corresponding IRS rates. Given Decomposition (1), these responses reflect the behavior of liquidity and risk premia. Note that using spreads between corporate and government bond yields is not suitable for our purposes because such spreads contain the government bond convenience yield, which in turn is significantly responsive to our shock.[4]

### 3.2.1 Additional Macro-Financial Data

We use several aggregate daily frequency macro-financial variables in our analysis, all of which cover FFI MAKAM net capital inflows' sample (1/1/2017–8/31/2022). These variables, except those underlying the global financial shocks segment of the data, are taken from Bloomberg and their values are end-of-day quotes.

**Global Financial Shocks.** To control for shocks to global equity, corporate credit, wholesale funding, and safe asset markets, we include in our FFI-level regressions the first-differences of the corresponding 4 financial stress indices developed by the Office of Financial Research (OFR) (Monin (2019)). These indices are sub-indices of OFR's broader financial stress index and are computed as weighted averages of various regional (U.S., Europe, Japan, and emerging markets) indicators of equity market performance, corporate credit spreads, wholesale funding spreads (spreads between interbank rates and risk-free rates as well as 2-year USD/EUR and USD/JPY cross-currency bases), and safe asset market performance (10-year U.S. and German government bond yields, U.S. dollar broad exchange rate as well as its exchange rate with respect to the Swiss franc and Japanese yen, and the spot dollar price of gold). The weights are estimated with a dynamic factor model in the spirit of Bai and Ng (2008) and Stock and Watson (2011).[5]

**Local Financial Shocks.** To control for local equity and risk shocks in our FFI-level regressions, we use current and lagged values of the log-first-difference of the TA-35 index—which lists the largest 35 companies in the Tel Aviv Stock Exchange (TASE)—as well as the current and lagged values of the first-difference of the credit default swaps (CDS) price of 5-year Israeli government dollar bonds.

[4]This issue is generally not a concern for the literature that looks at such corporate bond spreads to analyze credit spreads because the explanatory variables they consider are mostly micro, bond-level variables incapable of moving convenience yields which are inherently aggregate in nature.

[5]For the OFR data and more details regarding it, the reader is referred to https://www.financialresearch.gov/financial-stress-index/.

**Interest Rates.** To control for foreign risk-free interest rates in our FFI-level regressions, we use the current and lagged values of changes in the 3-month U.S. t-bill rate. Correspondingly, we use the current and lagged value of changes in the BOI's declared monetary policy interest rate to control for local risk-free rates. The latter rate is effectively the interest rate earned by local banks on short-term deposits they hold with the BOI.

**USD/ILS Cross-Currency Basis.** We construct the USD/ILS cross-currency basis in the standard way, i.e., as the difference between the cash market risk-free dollar interest rate and the CIP-implied dollar interest rate (i.e., the inverse of the forward premium multiplied by gross local risk-free rate). FFIs tend to use short-term FX swaps in their CIP arbitrage activity and roll over their swap positions. Hence, the short-term, 1-month basis can be viewed as the arbitrage profit from their MAKAM investments. Accordingly, we control for lags of the 1-month basis in our FFI-level regressions. The dollar risk-free interest rate is measured by LIBOR. To construct the CIP-implied dollar rate, we use the 1-month MAKAM rate as our measure of the Israeli cash market risk-free interest rates as the MAKAM market serves as the investment vehicle for FFIs' USD/ILS CIP arbitrage.

### 3.2.2 Sectoral Rebalancing Flows

To investigate whether a meaningful portfolio-rebalancing-induced mechanism is driving our results, we use the 'Smart Money' database from the TASE, which includes daily and historical (dating back to 2018) aggregate buying and selling flows of institutional investors (pension/insurance /provident funds), mutual funds, exchange traded funds (ETFs), portfolio managers, local banks, TASE members, and foreign residents for all traded securities. Note that this database only pertains to secondary market flows and hence covers only a limited portion of FFIs' MAKAM trading.

### 3.2.3 Summary Statistics

Table 1 presents summary statistics for the main variables in our analysis. This table also shows summary statistics for monthly sectoral MAKAM holding shares for the FFI, local banks, and mutual fund sectors, as well as corporate bond and equity holding shares for the mutual funds sector.

Figure 3 shows the daily evolution of the MAKAM convenience yield (left panel). For completeness, we also show the MAKAM and TELBOR rate series (right panel). All series are averages over the individual 1-12 month maturity-specific series.

The close-to-zero TELBOR and MAKAM rates for the majority of the sample (up to April 2022) emphasize the corresponding zero lower bound (ZLB) state characterizing the BOI's policy stance, from the beginning of our sample through April 2022, when the BOI began raising their policy rate. For our purposes, it is important to focus on the MAKAM convenience yield's dynamics and, in particular, its persistent shift into meaningful positive territory from early January of 2021 onwards, averaging 25.3 basis points. It is noteworthy that before this shift, there was no convenience yield in MAKAM, with the average yield effectively null at -0.4 basis points.

While the MAKAM convenience yield clearly increases considerably further in tandem with the monetary-policy-induced rise in the MAKAM yield from April 2022 onwards, there is also a meaningful increase that takes place concurrently with the ZLB period (the average convenience yield from truncating the sample at 4/11/21—i.e., the start of rate hikes from the BOI—is 12 basis points). See Online Appendix A for more discussion.

## 3.3 Estimation

We estimate a daily frequency econometric model that consists of two estimation steps. The first estimates FFI-level regressions for our 18 FFIs' net capital inflows. The second step constructs a GIV capital inflow shock from the latter regressions' residuals and estimates this shock's dynamic effects on FFIs' aggregate accumulated net capital inflows and the MAKAM convenience yield using reduced-form local projection regressions. This dynamic analysis is crucial because it allows us to examine the persistence of the transmission mechanism we uncover in this paper. The identifying assumption for the GIV shock is that it captures daily idiosyncratic shifts in FFI preferences for MAKAM investment orthogonal to aggregate global and local shocks.

### 3.3.1 Econometric Model

**FFI-Level Specification.** In the first step, we estimate (via OLS) 18 FFI-level *reduced-form* regressions given by

$$net\_inflows_{i,t} = \mathbb{C}_t' \gamma_i + v_{i,t}, \tag{2}$$

where $net\_inflows_{i,t}$ is the net capital inflow of FFI $i$; $\mathbb{C}_t$ is a vector of observable controls that includes the fixed effect, day-dummies for Monday through Thursday, lagged values of $net\_inflows_{i,t}$, lagged values of the 1-month USD/ILS cross-currency basis which represents their effective net (arbitrage) profit from their MAKAM investments, and current and lagged values of the following exogenous controls:[6] first-differences of 3-month U.S. t-bill rate and BOI monetary policy rate to control for shocks to U.S. and local monetary policy stances; first-differences of OFR's global equity, corporate credit, wholesale funding, and safe asset markets to control for global financial shocks; log-first-differences of the TA-35 index to control for local equity market shocks; and first-differences of the 5-year CDS price of Israeli government dollar bonds to control for local risk shock. $v_{i,t}$ is the regression's residual, where $v_{i,t} = \eta_t + \epsilon_{i,t}$, with $\eta_t$ and $\epsilon_{i,t}$ representing an unobserved common shock and the FFI $i$'s idiosyncratic capital inflow shock, respectively. Regression (2) does a fairly good job of explaining the variation in FFI-level net capital inflows, with mean and standard deviation of the $R^2$s across the 18 FFI-level regressions being 37.1% and 23.5%, respectively.

Our sought-after shocks are the $\epsilon_{i,t}$s, as we wish to use these exogenous, idiosyncratic shocks to construct our GIV shock. The GIV shock construction from the estimated $\hat{v}_{i,t}$ removes the variation from the unobserved common component $\eta_t$, and is thus able to remove potential estimation bias from unobserved common shocks. We now turn to a description of our second estimation step, which deals with the construction of the GIV shock and estimating its effects.

[6] The number of lags for FFI-level net capital inflows, 1-month USD/ILS cross-currency basis, and exogenous controls in $\mathbb{C}$ is common and determined as the average of the chosen lag specifications from the AIC, corrected AIC, BIC, and HQIC lag length criteria tests for each FFI-level regression. The mean and standard deviation of lags across the 18 regressions are 15.9 and 3.4, respectively.

**Estimation of GIV Shock's Effects.** Following Gabaix and Koijen (2024), we define the GIV shock (denoted by $\varrho_{GIV,t}$) as the difference between the size-weighted- and inverse-variance-weighted-average of the estimated idiosyncratic shocks, i.e., $\varrho_{GIV,t} = \sum_{i=1}^{18} \hat{v}_{i,t} w_i - \sum_{i=1}^{18} \hat{v}_{i,t} u_i$ (normalized to have unit standard deviation), where the weights $w_i$s are calculated from the share of each FFI's average net capital inflows volume in total FFIs' average volume, and $u_i$ is the share of $\hat{v}_{i,t}$'s inverse variance in the sum of estimated residuals' inverse variances. As shown in Gabaix and Koijen (2024), this inverse-variance-weights-based GIV construction is optimal in the sense that the resulting estimation possesses the highest precision.

FFI presence in the MAKAM bond market is highly concentrated, bearing an average Herfindahl-Hirschman Index of 0.47 for FFIs' net capital inflow volumes, with variation in inflows being primarily driven by a few large FFIs. This concentrated structure delivers sufficient exogenous variation from idiosyncratic capital inflow shocks, allowing us to identify monetary policy transmission impairment without concern that the variation is confounded by unobserved common shocks. Our $\hat{v}_{i,t}$s do not appear to contain any material unobserved common component, as evinced by their low average absolute pairwise correlation of 5.9% and a corresponding standard deviation of 6.8%.[7] But this common component is also non-negligible, highlighting the importance of the GIV construction in removing it. In sum, both the concentrated structure of the bond market under study and the GIV shock approach's ability to remove even moderate biasing variation from unobserved common shocks validate the suitability of the GIV shock approach for the estimation of our convenience yield channel.

In the second step, we estimate *reduced-form* local projection regressions given by

$$(accum\_net\_inflows_{t+h} - accum\_net\_inflows_{t-1})/outstanding_{t-1} = \alpha_h + \Omega_h \varrho_{GIV,t} + u_t, \tag{3}$$

$$conv\_yield_{t+h} - conv\_yield_{t-1} = \beta_h + \Xi_h \varrho_{GIV,t} + z_t, \tag{4}$$

where $h = 0, 1, ..., 500$ is the local projection horizon; $accum\_net\_inflows_t = \sum_{i=0}^{t} net\_inflows_i$ is FFIs' aggregate accumulated net capital inflows ($i = 0$ represents the beginning of our sample) where,

[7] It is reasonable to expect only modest correlation among our 18 FFIs' net capital inflows, given the high-frequency (daily) nature of our data. This expectation is borne out by the data with an average absolute pairwise correlation among the 18 FFIs of 10.9% and a corresponding standard deviation of 12.2%. Importantly, by removing the effects on these flows of various common drivers, our estimation procedure is capable of meaningfully reducing these numbers to 5.9% and 6.8%, respectively.

for economic scaling, we normalize the cumulative difference in $accum\_net\_inflows_t$ by the previous day's value of total outstanding bonds ($outstanding_{t-1}$); and $conv\_yield_t$ is the MAKAM convenience yield variable. See Section 4 for extensions of the analysis, where we also consider as outcome variables various additional variables of interest. $\Omega_h$ and $\Xi_h$ represent the impulse responses of the FFIs' accumulated net capital inflows (as a share of total outstanding MAKAM) and convenience yield variable, respectively.

**Forecast Error Variance Estimation.** In Online appendix C, we describe the estimation of the contributions of the GIV capital inflow shocks to the forecast error variance (FEV) of our considered outcome variables. FEV shares are analogous to dynamic $R^2$s.

## 3.4 Estimation of Bond Supply Elasticity

A special case of interest for Equations (3) and (4) lies in the impact horizon case of $h = 0$, where the convenience yield variable is replaced by the MAKAM rate. This case allows us to estimate the elasticity of supply in the MAKAM market. Note that this slope can only be reliably estimated on impact. This is because, over time, the capital inflow shock is likely to induce additional shifts in the bond supply curve, as various market participants may adjust their bond supply in response to post-shock price movements.

More specifically, we estimate the following bond supply equation via 2SLS:

$$\begin{aligned} &makam\_rate_t - makam\_rate_{t-1} = \delta + \\ &\theta(accum\_net\_inflows_{t+h} - accum\_net\_inflows_{t-1})/oustanding_{t-1} + e_t. \end{aligned} \tag{5}$$

A significant negative estimate of $\theta$ is necessary for establishing an upward-sloping bond supply curve (in the bond price-quantity plane). Such a result serves as motivation for this paper's dynamic analysis of the convenience yield, because a natural starting point for such analysis is to confirm that the bond supply curve is not perfectly elastic, in which case there would be no economic underpinning for expecting a meaningful convenience yield of any nature (static or dynamic).

# 4 Empirical Evidence

This section presents the main results of the paper. We start with the motivational results from the estimation of the bond supply curve in the MAKAM market, as described in Section 3.4. We then show the dynamic results for the MAKAM convenience yield and FFIs' aggregate accumulated net capital inflows, after which we focus on the convenience yield's spillover into the government and corporate bond markets as well as the equity market. We also briefly discuss an array of robustness checks, fully shown in Online Appendix D, followed by a sectoral flow analysis using supplementary data from the TASE that highlights a local portfolio-rebalancing mechanism. We end the section with both data- and institutional-setting-based evidence supporting our assumption that TELBOR and IRS rates capture the risk-free yield curve well.

## 4.1 Estimation Results for Bond Supply Elasticity

Table 2 shows the results from the estimation described in Section 3.4: a 2SLS-estimated first-stage effect of the GIV capital inflow shock on FFIs' aggregate net capital inflows as a share of total outstanding bonds (second column); the reduced-form effect on the MAKAM rate (fourth column); and the 2SLS second-stage estimate of the bond supply elasticity (third column) conditional on the GIV capital inflow shock. For completeness, we also report in the first column the OLS-estimated effect from Structural Equation (5). The net capital inflows variable is multiplied by 100 prior to entering the regressions for comparability purposes and hence its response is in terms of one-percentage-point (as share of outstanding MAKAM) changes; the resultant estimated supply slope is thus in terms of a 1-percentage-point increase in FFIs' aggregate net capital inflows (as a share of outstanding MAKAM).

The reduced-form and 2SLS first-stage estimates are with respect to a GIV capital inflow shock that generates a peak 10-percentage-point increase in FFIs' aggregate net capital inflows (as a share of outstanding MAKAM). This normalization—which we base on the historical decomposition analysis in Online Appendix B—is also done in the subsequent dynamic analysis and implies a 3.4-standard-deviation GIV capital inflow shock.

The results in Table 2 provide valuable motivation for the subsequent dynamic analysis of monetary transmission imperfection, and establish an upward-sloping bond supply curve (in the bond price-quantity plane): a GIV capital inflow shock-induced 1-percentage-point increase in FFIs' aggregate net capital inflows (as a share of outstanding MAKAM) generates a 0.62 basis point decline in the MAKAM rate. While this constitutes a somewhat modest supply elasticity, what matters to us is the highly significant nature of this estimated slope which clearly rejects the hypothesis of a perfectly elastic supply curve.[8] In what follows, we turn to a dynamic analysis of the monetary transmission imperfection, which we demonstrate to be very rich in providing persistent and gradually-increasing effects of the capital inflow shock on the MAKAM convenience yield and FFIs' aggregate net capital inflows variables.

## 4.2 MAKAM Convenience Yield and FFIs' Accumulated Net Capital Inflows

**Impulse Responses.** Figure 4 shows impulse responses to the GIV capital inflow shock of the MAKAM convenience yield and FFIs' accumulated net capital inflows (as a share of total outstanding MAKAM). We normalize the two variables' responses, such that the response of the accumulated net capital inflow variable reaches a peak of 10 percentage points; i.e., FFIs accumulate a 10-percentage-point net capital inflow increase as a share of outstanding MAKAM. This peak response takes place after 363 trading days, which demonstrates the highly persistent nature of FFI bond purchasing following the capital inflow shock.

Note that the latter 10-percentage-point normalization implies that the responses from Figure 4 are with respect to a 3.4-standard-deviation GIV capital inflow shock. While this is a large shock, we consider our normalization reasonable, given the high-frequency (daily) nature of our shock series and that, over the course of our sample, the actual realizations of our GIV capital inflow shocks have accounted for above and beyond the run-up in FFIs' net capital inflows (as a share of outstanding MAKAM) from early 2020 to the later part of our sample. This is confirmed by Online Appendix B's historical decomposition results. These historical decomposition results indicate

[8] While not shown here, we have confirmed that the capital inflow shock has an insignificant effect on the TELBOR rate (with a positive point estimate) as expected given that this variable reflects the current and future local monetary policy stance which in turn should not be related to our identified high-frequency GIV capital inflow shock.

that the run-up period was dominated by positive shocks, with magnitudes far exceeding the 3.4-standard-deviation shock normalization for our impulse responses exposition. Importantly, when we examine the importance of our capital inflow shock in driving the variation in the convenience yield variable in the FEV estimation, we consider a one-standard-deviation demand shock.

The MAKAM convenience yield increases significantly for the bulk of the considered horizons, in a persistent and gradual manner. The response on impact is 1.2 basis points (with a t-stat of 3.5), while the peak response—which takes place after 480 trading days—is 8.7 basis points (with a t-stat of 2.2). The response is significant at the 95% and 90% confidence levels for a total of 414 and 492 trading days, respectively.

What explains the persistent convenience yield response just discussed? The right panel of Figure 4 shows that FFIs buy bonds following the capital inflow shock in a highly persistent and gradual manner, increasing their accumulated net capital inflows (as a share of outstanding MAKAM) by 1.4 percentage points on impact while gradually building up to a 10-percentage-point share increase at its peak after 363 trading days. The response is significant at the 95% and 90% confidence levels for a total of 471 and 501 (i.e., for all considered horizons) trading days, respectively. The gradual and persistent nature of the accumulated net capital inflows variable is consistent with theories of slow-moving capital, where there are institutional constraints on market entrance, such as search and portfolio adjustment costs and time to raise capital, and these constraints are slowly and gradually alleviated (see, e.g., Mitchell et al. (2007), Duffie (2010), and Jiang and Sun (2024)). We stress that our capital inflow shock is a white noise shock, i.e., possessing no autocorrelation, as indicated from the Ljung-Box Q-test for residual autocorrelation. Hence, the persistence of our estimated responses is not coming from shock autocorrelation but rather from the persistent propagation of the shock's effect.

**FEVs.** Figure B.1 in the Online Appendix shows the contributions of a one-standard-deviation GIV capital demand shock to the variation over our considered horizons in the convenience yield variable and FFIs' accumulated net capital inflows (as a share of outstanding MAKAM). For the former variable, the peak FEV share is attained after 500 horizons, with an estimated 39.6% share. That our capital inflow shock explains such a meaningful share after roughly two calendar years is a testament to the added value of the *dynamic* dimension of our econometric analysis, as well as the associated gradual and persistent nature of our shock's effects.

The above-mentioned 39.6% peak FEV share for the MAKAM convenience yield is consistent with the very high FEV share of the variation in FFIs' accumulated net capital flows variable accounted for by our shock. Already on impact, our shock explains an important 31.5% share of the variation in this variable. And after 149 trading days, this share reaches its peak of 69.6%, remaining very high persistently throughout the remaining horizons with an estimated share of 51.9% at the last (500th) horizon.

## 4.3 Additional Analysis: Government Bond, Corporate Bond, and Equity Markets

**Government Bond Convenience Yields: Impulse Responses.** Figure 5 shows the responses of the 1- through 5-year and 10-year government bond convenience yields. Clearly, the convenience yield dynamics from Figure 4 meaningfully spill over to the government bond market, with the six government bond convenience yields significantly rising at the 95% (90%) confidence level for 270 (416), 465 (483), 335 (410), 279 (324), 276 (324), and 82 (133) trading days (by increasing order of bond maturity) with corresponding peak responses of 8.1 basis points (491st horizon), 7.5 basis points (365th horizon), 6.6 basis points (386th horizon), 5.6 basis points (402nd horizon), 5.1 basis points (402nd horizon), and 3.9 basis points (386th horizon). As bond maturity increases, the responses quantitatively weaken, largely in accordance with the expectations hypothesis.

**Government Bond Convenience Yields: FEVs.** Figure B.2 in the Online Appendix shows how a one-standard-deviation GIV capital inflow shock contributes to variation in the six government bond convenience yield variables over our considered horizons. Our capital inflow shock accounts for peak FEV shares of the variation in these variables of 42% (499th horizon), 48% (346th horizon), 57.2% (321st horizon), 52.6% (432nd horizon), 50.8% (415th horizon), and 37.3% (500th horizon). Similar to the baseline convenience yield variable, our capital inflow shock accounts for important shares of the variation in the government bond convenience yields.

**Corporate Bond Spreads: Impulse Responses.** Figure 6 shows the responses of the spreads between the 1- through 5-year and 7- and 10-year investment-grade corporate bond yields and the corresponding IRS rates. As opposed to the government bond spread, we also consider the 7-year spread, because corporate bond yields—unlike government bond yields—do not suffer from illiquidity-related missing observations at the 7-year maturity.

These spreads—which contain both liquidity and risk premia—possess significant responses at the 95% (90%) confidence level for 147 (229), 435 (477), 249 (329), 247 (294), 249 (314), 312 (393), and 89 (174) trading days (in increasing maturity order) with corresponding trough responses of -27 basis points (365th horizon), -31.6 basis points (380th horizon), -22.4 basis points (237th horizon), -17.3 basis points (365th horizon), -24.7 basis points (385th horizon), -23 basis points (331st horizon), and -16.8 basis points (382nd horizon). Overall, we observe a significant spillover effect of the convenience yield mechanism into the corporate bond market at both the short and long ends of maturities.

**Corporate Bond Spreads: FEVs.** Figure B.3 in the Online Appendix shows how a one-standard-deviation GIV capital inflow shock contributes to variation in the seven corporate bond yield spread variables over our considered horizons. Our capital inflow shock accounts for peak FEV shares of the variation in these variables of 53.6% (402nd horizon), 50.9% (321st horizon), 52% (320th horizon), 36.8% (396th horizon), 44.9% (348th horizon), 37.2% (345th horizon), and 37.1% (500th horizon). These estimated FEV shares indicate that our capital inflow shock accounts for a meaningful share of the variation in the corporate bond yield spread variables.

**Equity Market: Impulse Responses.** Figure 7 shows the response of the TA-35 stock price index. The response is significant at the 95% (90%) confidence level for 267 (348) horizons and peaks at 5.7% after 388 horizons. Overall, we observe a significant spillover effect of the convenience yield mechanism into the equity market.

**Equity Market: FEVs.** Figure B.4 in the Online Appendix shows how a one-standard-deviation GIV capital inflow shock contributes to variation in the TA-35 stock price index over our considered horizons. Our capital inflow shock accounts for a peak FEV share of the variation in this variable of 42.1% at the 405th horizon. This estimated FEV share indicates that our capital inflow shock accounts for a meaningful share of the variation in the equity index variable.

## 4.4 Robustness Checks

Online Appendix D examines and confirms the robustness of the baseline impulse response and FEV results presented in the previous section along four dimensions. The first considers alternative lag specifications for the FFI-level regressions. The second truncates the baseline sample at 4/11/2022 to confirm that the baseline results are robust to omission of the monetary tightening period of our sample. The third replaces the inverse-variance-weighted-average shock component in the GIV construction with the equally-weighted-average shock. And the fourth adds the flows of the foreign custodian bank discussed in Footnote 2 as a control in the FFI-level regressions to confirm that the baseline results are robust to unobserved custody-based flows.

## 4.5 Local Portfolio Rebalancing Effects

The results shown above for corporate bonds and equities demonstrate a relatively high corporate bond spread and equity price response magnitude relative to the MAKAM convenience yield. This section aims to explore if this is driven by a local portfolio rebalancing mechanism, where a particular sector that sells MAKAM bonds to FFIs uses the proceeds to purchase corporate bonds and equities, thus generating a rebalancing-induced rise in their prices.

Toward this end, this section makes use of supplementary TASE-owned data (also known as the 'Smart Money' database—see Section 3.2.2 for more details) on secondary market activity by sectors in the MAKAM, government and corporate bond, and equity markets. (In accordance with the government and corporate bond spread analysis, we restrict attention to nominal government and investment-grade corporate bonds with maturities of up to 10 years.)

In what follows, for ease of exposition, we focus our analysis solely on the local mutual fund (MF) sector. The reason for this expositional choice is that our experimentations with the sectors available in the supplementary secondary market data revealed that MFs appear to effectively be the sole counterparty against which FFIs conduct their demand-driven secondary market MAKAM purchases.

**MFs' and FFIs' Secondary Market MAKAM Flows: Impulse Responses.** Figure 8 shows impulse responses to the GIV capital inflow shock of MFs' and FFIs' accumulated MAKAM flows (as a share of outstanding MAKAM bonds) from the secondary MAKAM market. Echoing the previous discussion about the important role of primary-market-related purchases by FFIs in driving their demand, we can see that the peak response of the secondary market accumulated flow variable of FFIs is 3 percentage points after 475 trading days (with a t-stat of 2), or only 30% of the 10-percentage-point peak baseline response from the baseline data. (The response is significant at the 95% (90%) confidence level for 232 (415) horizons.) This tells us that accounting for primary-market-related demand flows is crucial for identification.

Who mainly serves as the counterparty to FFIs' secondary market demand is revealed by MFs' accumulated flow response, which is to a good approximation the mirror image of that of FFIs. (The response is significant at the 95% confidence level for all (501) considered horizons and troughs at -2.1 percentage points after 475 horizons.) The correlation between the first-differences (slopes; we take first-differences for stationarity) of the two impulse response functions is -89.3%, in accordance with the quantitative and qualitative similarity between these functions. This important result begs the following intriguing question: do MFs allocate a meaningful share of the proceeds from their secondary market MAKAM trading with FFIs to corporate bond and equity investments? After briefly discussing the FEV results for the MAKAM flows, we answer this question in the affirmative by looking at the corresponding corporate bond and equity flows.

**MFs' and FFIs' Secondary Market MAKAM Flows: FEVs.** Figure B.5 in the Online Appendix shows the contributions of a one-standard-deviation GIV capital inflow shock to the variation over our considered horizons in MFs' and FFIs' accumulated MAKAM flows (as a share of outstanding MAKAM bonds) from the secondary MAKAM market. It is apparent that our shock is a leading driver of the variation in these two variables, reaching peak FEV shares of 70.8% (473th horizon) and 67.5% (309th horizon), respectively.

**MFs' Rebalancing Flows: Impulse Responses.** Figure 9 shows impulse responses to the GIV capital inflow shock of MFs' accumulated government bond, corporate bond, and equity flows from their corresponding secondary markets (all flows are normalized as shares of outstanding MAKAM bonds for comparability with Figure 8).

MFs' accumulated government bond, corporate bond, and equity flow responses peak at 0.75, 0.67, and 0.83 percentage points after 324, 379, and 363 horizons (with t-stats of 2.1, 2.9, and 2.5), respectively, which indicates a meaningful portfolio rebalancing by MFs from MAKAM into government bond, corporate bond, and equity investments. (The responses are significant at the 95% (90%) confidence level for 125 (163), 162 (259), and 108 (210) horizons, respectively.) Specifically, considering that MFs' accumulated MAKAM flows response is -1.8, -1.8, and -2.1 percentage points after 324, 378, and 363 horizons, respectively, the just-mentioned peak responses of 0.75, 0.67, and 0.83 percentage points imply that MFs allocate at these peak-implied horizons 41.7%, 37.2%, and 39.5% of their proceeds from MAKAM trading with FFIs to investment in government bond, corporate bond, and equity markets, respectively.

The meaningful rebalancing from mutual funds, evident from Figure 9, is valuable in explaining the relatively large corporate bond spread and equity price responses from Figures 6 and 7, respectively, as it highlights an important local portfolio rebalancing from MAKAM bonds to corporate bonds and equities. Given that these markets trade significantly riskier assets than both the MAKAM and government bond markets, it is sensible to expect significant rebalancing flows into these markets to induce meaningful price changes. The specific and unique role we find for mutual funds in this rebalancing echoes the similar role found for these institutions in amplifying the effects of quantitative easing in the U.S. (Selgrad (2023) and Acharya et al. (2025)) and euro area (Breckenfelder and De Falco (2024)).

**MFs' Rebalancing Flows: FEVs.** Figure B.6 in the Online Appendix shows how a one-standard-deviation GIV capital inflow shock contributes to variation in MFs' accumulated government bond, corporate bond, and equity secondary market flows (as shares of outstanding MAKAM bonds) over our considered horizons. Our shock accounts for peak FEV shares of 65.2% (500th horizon), 61.9% (417th horizon), and 62.2% (500th horizon) for these three variables, respectively. These significant shares indicate that our shock is the main driver of the variation in MFs' accumulated rebalancing flows across all three considered markets, i.e., the rebalancing mechanism we uncover is responsible for the bulk of the variation in MFs' government bond, corporate bond, and equity investment activity. Given that MFs are the largest position holder in the corporate bond market, holding an average market share of 28.6% over our sample period, our FEV result implies that our shock is likely to generate a considerable rebalancing-induced price effect in the corporate bond market. Although the corresponding average market share for stocks is much more modest at 3.5%, it is sufficiently meaningful—taken together with the considerable FEV share of MFs' equity investment accounted for by our shock—to imply a significant rebalancing-induced equity price increase.

### 4.6 Do IRS Rates Capture the Long-Term Risk-Free Yield Curve Well?

The underlying assumption of this paper's analysis is that TELBOR and IRS rates, which are used to construct our short-term and longer term convenience yield measures, respectively, are sound measures of the risk-free yield curve. Section 3.1.1 explains how the BOI's regulation of the TELBOR market ensures that TELBOR rates are effectively indexed to the overnight risk-free rate in the economy, and thus provide a good measure of the short-term risk-free yield curve. However, for longer term maturities for which TELBOR are unavailable, it is important to alleviate the concern that our risk-free rate measure for such maturities—IRS rates—may not be a sound measure of the longer term risk-free yield curve.

IRS rates are effectively the risk-neutral weighted averages of current and future (expected) TEBLOR rates, where zero-coupon present values of the interest payments are used to determine the weights; as such, given the institutional setting described in Section 3.1.1 which imposes on TELBOR rates to be effectively indexed to overnight risk-free rate underlying OISs, IRS rates provide a good measure of the risk-free yield curve at longer horizons for which TELBOR rates are unavailable. Hence, the spread between IRS rates and government bond yields is a sound measure of the convenience yield of government bonds.

To further alleviate the concern that IRS rates are not good measures of the longer term risk-free yield curve, we computed the correlations between the $h$-step-ahead cumulative differences in the 1-year IRS and TELBOR rates (the only maturity for which the two rates are available). These dynamic correlations capture how closely the two variables move over time. In particular, we computed the correlation between $irs\_rate_{t+h} - irs\_rate_{t-1}$ and $telbor\_rate_{t+h} - telbor\_rate_{t-1}$ for $h = 0, 1, ..., 500$. The impact correlation is highly significant at 69.5% and increases very quickly, reaching 92.5% after 10 horizons and 98.8% after 20 horizons.

The rather fast convergence to an effectively perfect correlation implies that over longer horizons the risk-free yield curve is the sole driver of variation in TELBOR and IRS rates. A similar result holds for MAKAM rates, with dynamic correlations between MAKAM and TELBOR rates increasing rapidly with $h$, reaching 74.7% by the 10th horizon and 97.1% at the 100th horizon. Hence, analogous to the case of the MAKAM convenience yield (TELBOR-MAKAM spread), subtracting government bond yields from IRS rates in our local projection regressions serves the purpose of removing this risk-free yield component, and thus isolating the dynamic effect on convenience yields in government bond yields.

# 5 Conclusion

This paper documents a significant and persistent positive response of the Israeli short-term convenience yield following a capital inflow shock that increases FFIs' demand for local risk-free short-term bonds. The latter capital inflow shock also leads to significant and persistent increases in longer term convenience yields and equity prices, as well as corresponding declines in corporate bond spreads. We uncover a local-portfolio-rebalancing-induced rise in corporate bond and equity prices as our capital inflow shock leads to MFs (FFIs' counterparty in the MAKAM secondary market) allocating their MAKAM proceeds to corporate bond and equity investments. Our set of findings, obtained from a granular econometric approach, can be viewed as representing evidence in favor of a meaningful convenience yield channel that points to a meaningful monetary policy transmission impairment in the presence of capital inflow shocks.

This paper's results shed light on the challenges central banks face of enforcing their target rate in the short-term risk-free bond market when hit by large capital inflow shocks. As a negligible convenience yield is a necessary condition for proper transmission of the monetary policy rate into the real economy, the novel and meaningful convenience yield channel we find represents an important impediment to monetary transmission mechanism.

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Table 1: Summary Statistics of Main Variables.

| Variable | Mean | Std. | Min | Max | N |
|---|---|---|---|---|---|
| **Panel A: Main Variables** | | | | | |
| MAKAM Convenience Yield (bps) | 7.41 | 18.06 | -16.86 | 103.49 | 1394 |
| MAKAM (bps) | 18.47 | 27.08 | -19.96 | 198.19 | 1394 |
| TELBOR (bps) | 25.88 | 41.54 | 5.71 | 273.50 | 1394 |
| Aggregate Daily FFIs' Net Capital Inflows[a] | 0.09 | 0.46 | -4.67 | 3.80 | 1394 |
| USD/ILS Cross-Currency Basis (bps) | -33.70 | 23.37 | -297.67 | 7.70 | 1394 |
| **Panel B: Government Bond Market** | | | | | |
| 1Y Gov Bond Convenience Yield (bps) | 8.70 | 19.15 | -17.19 | 104.50 | 1394 |
| 2Y Gov Bond Convenience Yield (bps) | 6.16 | 16.38 | -28.84 | 72.14 | 1394 |
| 5Y Gov Bond Convenience Yield (bps) | -1.70 | 12.40 | -25.22 | 34.30 | 1394 |
| 10Y Gov Bond Convenience Yield (bps) | -6.66 | 9.59 | -26.10 | 27.89 | 1394 |
| **Panel C: Corporate Bond Market** | | | | | |
| 1Y Corp Bond-IRS Spread (bps) | 135.88 | 43.00 | 17.68 | 286.82 | 1394 |
| 2Y Corp Bond-IRS Spread (bps) | 164.04 | 45.29 | 51.14 | 313.89 | 1394 |
| 5Y Corp Bond-IRS Spread (bps) | 167.34 | 36.84 | 68.83 | 318.26 | 1394 |
| 10Y Corp Bond-IRS Spread (bps) | 121.69 | 34.79 | 59.77 | 290.18 | 1394 |
| **Panel D: Other Financial Variables** | | | | | |
| Banks MAKAM Holdings[b] | 25.08 | 17.04 | 1.88 | 50.64 | 68 |
| FFIs MAKAM Holdings[b] | 18.33 | 14.78 | 0.68 | 50.35 | 68 |
| MF MAKAM Holdings[b] | 15.00 | 2.29 | 10.27 | 18.97 | 68 |
| MF Corp Bond Holdings[c] | 28.62 | 1.81 | 25.32 | 32.00 | 68 |
| MF Equity Holdings[c] | 3.50 | 0.34 | 2.67 | 4.14 | 68 |
| MFs' Daily Government Bond Flows[d] | 0.2 | 6.81 | -64.60 | 45.62 | 1149 |
| MFs' Daily Corporate Bond Flows[d] | 1.44 | 2.68 | -22.23 | 20.96 | 1149 |
| MFs' Daily Equity Flows[d] | -0.17 | 3.27 | -39.04 | 22.27 | 1149 |
| Total MAKAM Outstanding[e] | 105.50 | 13.09 | 86.97 | 139.92 | 1394 |

[a] Expressed as a percentage of outstanding MAKAM.
[b] Expressed as a percentage of total outstanding MAKAM. Based on monthly observations.
[c] Expressed as a percentage of respective market capitalization.
[d] Expressed in basis points relative to outstanding MAKAM.
[e] In ILS billions.

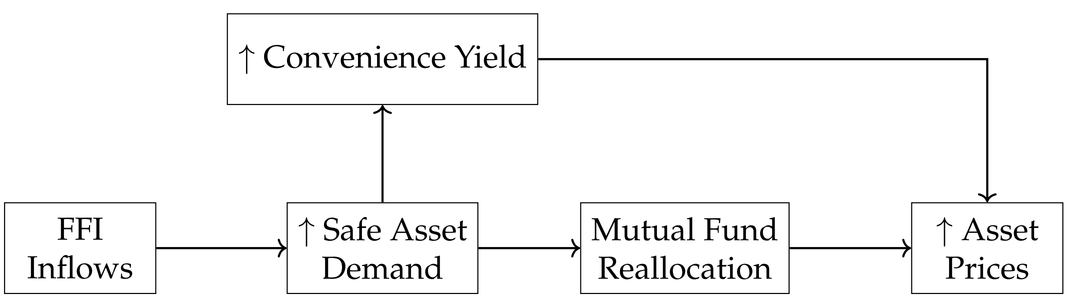
*Notes*: This table presents summary statistics for the main variables used in our analysis over the period January 2017 to August 2022. Panel A reports statistics for the primary variables including the MAKAM convenience yield (the difference between TELBOR and MAKAM rates, both averaged across 1-12 month maturities). Panel B presents government bond convenience yields (spreads between maturity-matched interest rate swaps (IRS) and government bond yields). Panel C shows analogous spreads for corporate bonds. Panel D reports various holdings and flow measures for different market participants. These daily flows represent secondary market transactions only. All spreads and interest rates are expressed in basis points (bps) unless otherwise noted. FFIs refers to foreign financial institutions, MF to mutual funds, and IRS to interest rate swaps.

Table 2: **Estimation of Bond Supply Curve Elasticity.**

| Response | OLS | 2SLS $1^{st}$ Stage | 2SLS $2^{nd}$ Stage | Reduced Form |
|---|---|---|---|---|
| MAKAM Rate | -0.55*** | | -0.62*** | -0.84*** |
| | (0.07) | | (0.07) | (0.32) |
| Net Capital Inflows | | 1.37*** | | |
| | | (0.06) | | |
| F-Stat | | 499.67 | | |
| $R^2$ | 1.15% | 75.64% | 1.09% | 1.09% |
| Obs | 1,366 | 1,366 | 1,366 | 1,366 |

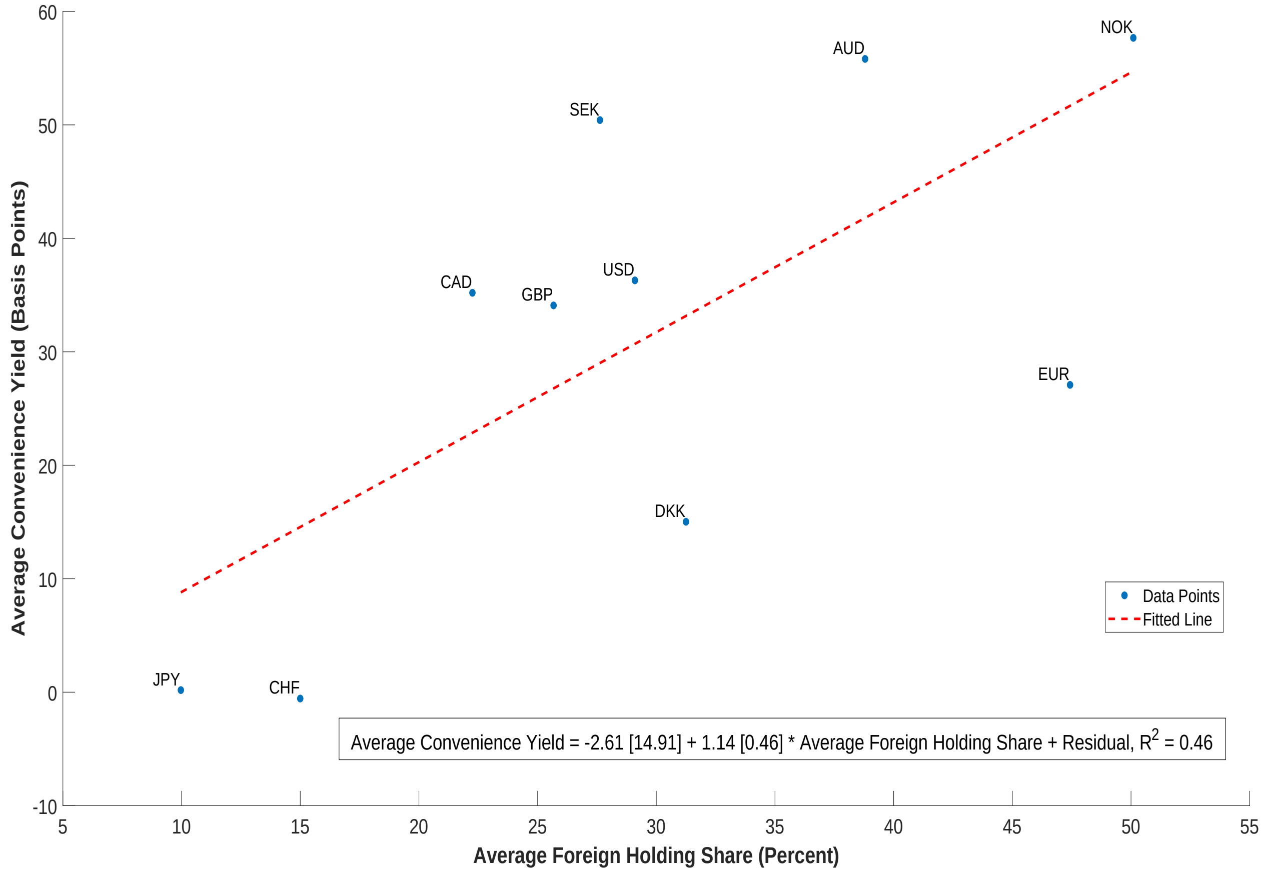
*Notes*: This table shows the results from the estimation described in Section 3.4: 2SLS-estimated first-stage effect of the GIV capital inflow shock on FFIs' aggregate MAKAM net capital inflows as a share of outstanding MAKAM (second column; in percentage points); the reduced-form effect on the MAKAM rate (fourth column; in basis points); and the 2SLS-estimated second-stage estimate of the bond supply curve elasticity (third column; in basis points) conditional on the GIV capital inflow shock. For completeness, we also report in the first column the OLS-estimated effect from Structural Equation (5). The MAKAM net capital inflow variable is multiplied by 100 prior to entering the regressions for comparability purposes and hence the resultant estimated supply slope is in terms of a 1-percentage-point increase in FFIs' net capital inflows (as a share of outstanding MAKAM). MAKAM rate response is in basis points and associated numbers in parentheses represent standard errors computed from the heteroskedasticity- and autocorrelation-consistent procedure of Newey and West (1987) with the truncation lag equal to one. *, **, and *** represent significance levels at the 10%, 5%, and 1% levels.

Figure 1: **Transmission Mechanism of Capital Inflow Shocks.**



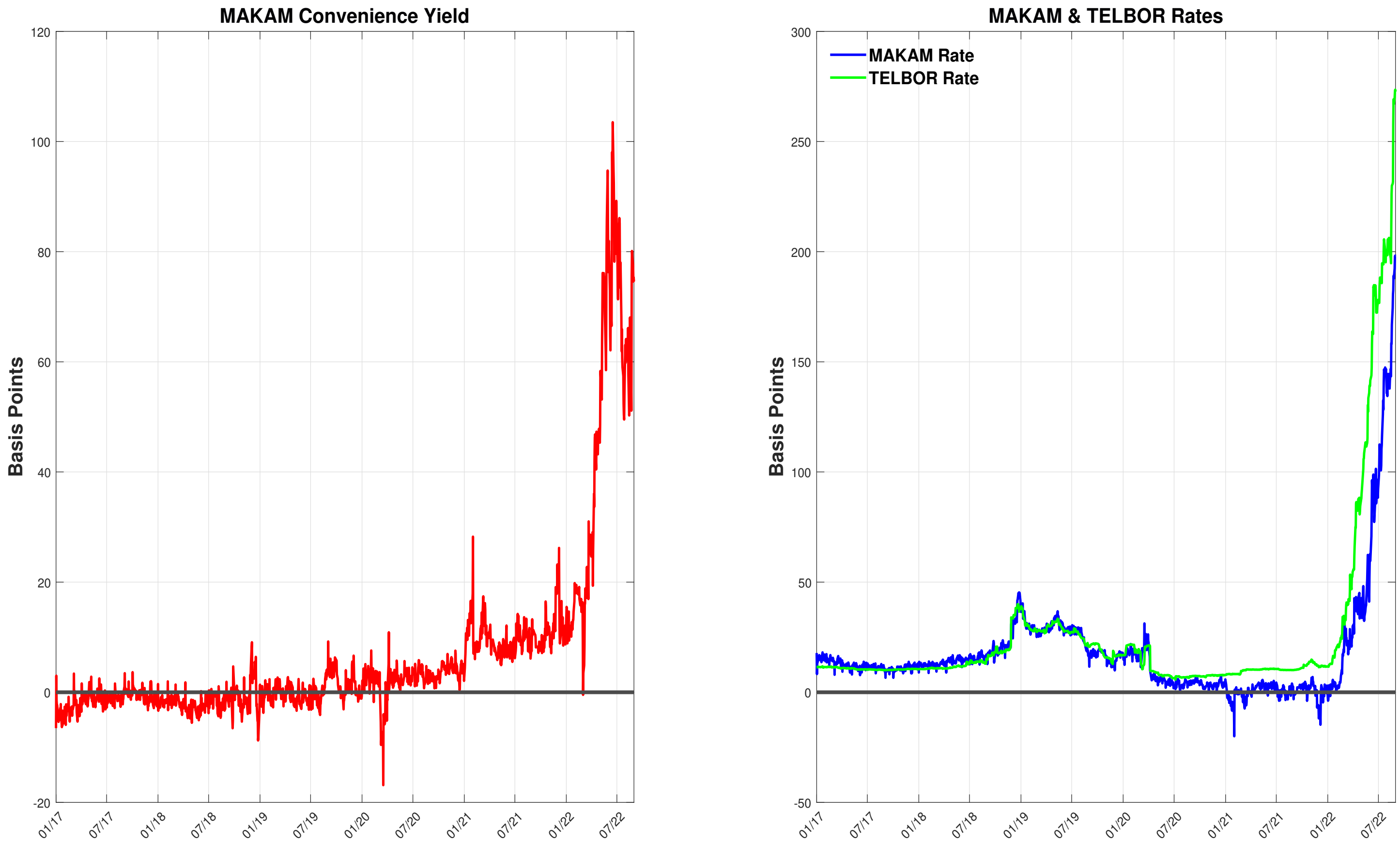

*Notes*: This figure presents the transmission mechanism by which capital inflow shocks affect risky asset prices, highlighting both the discount rate channel (convenience-yield-induced effect on asset prices) as well as the portfolio rebalancing channel (mutual-fund-reallocation-induced effect on asset prices).

Figure 2: **Cross-Sectional Regression of Local Convenience Yields on Foreign Holding Shares in Local Government Bond Markets.**



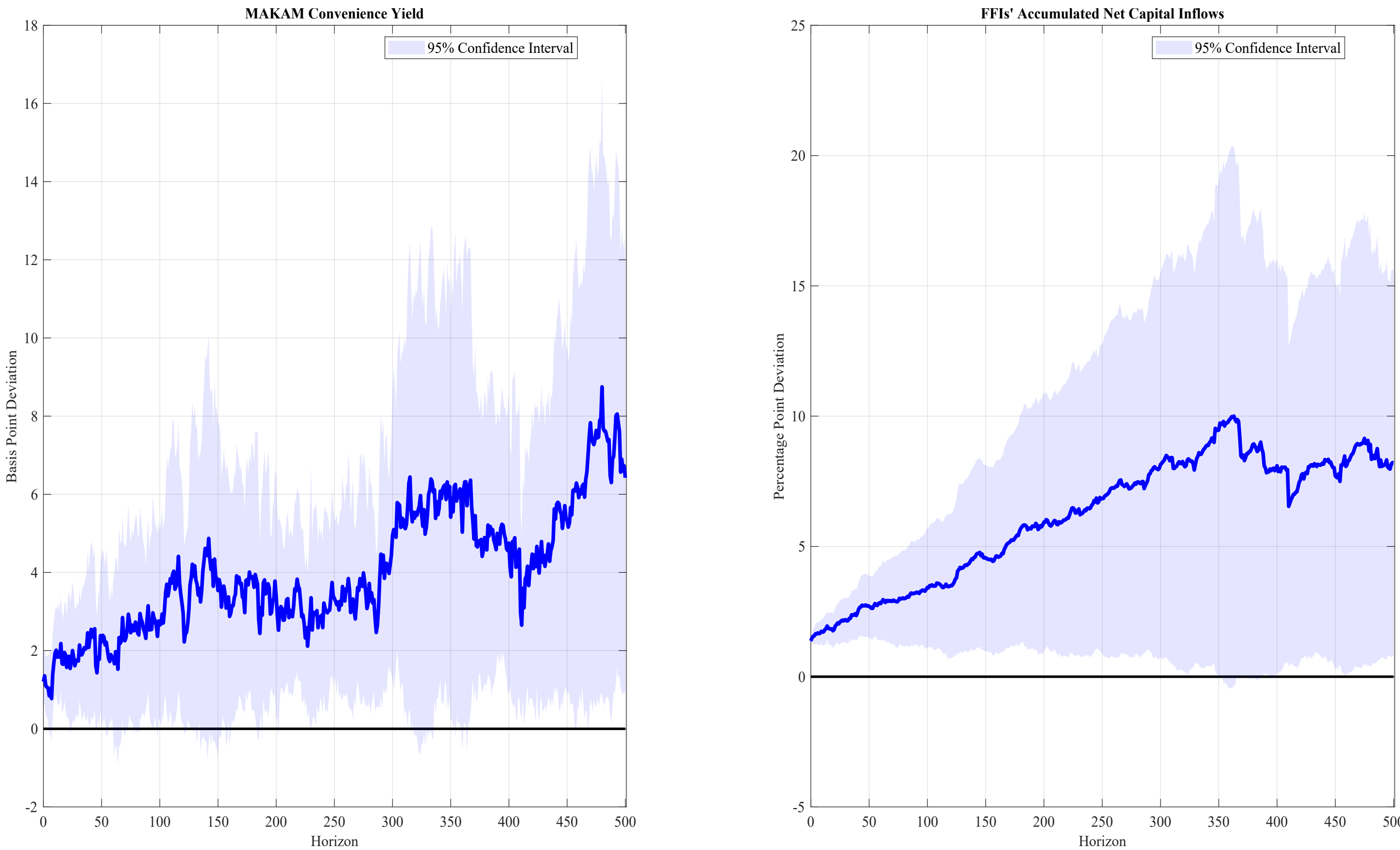

*Notes*: This figure presents the data points versus fitted line from a cross-sectional regression of local convenience yields on foreign holding shares in local government bond markets from 10 of the G11 currencies. The sample is dictated by the convenience yield data from Diamond and Van Tassel (2024), which runs from January 2005-July 2020. The foreign holding shares data, which measure the share in total government bond debt held by foreigners at quarterly frequency, is taken from Arslanalp and Tsuda (2014). The monthly convenience yield series are converted into quarterly frequency by averaging over monthly observations. Robust standard errors appear in squared brackets in the displayed regression equation.

Figure 3: **Time Series of MAKAM Convenience Yield.**



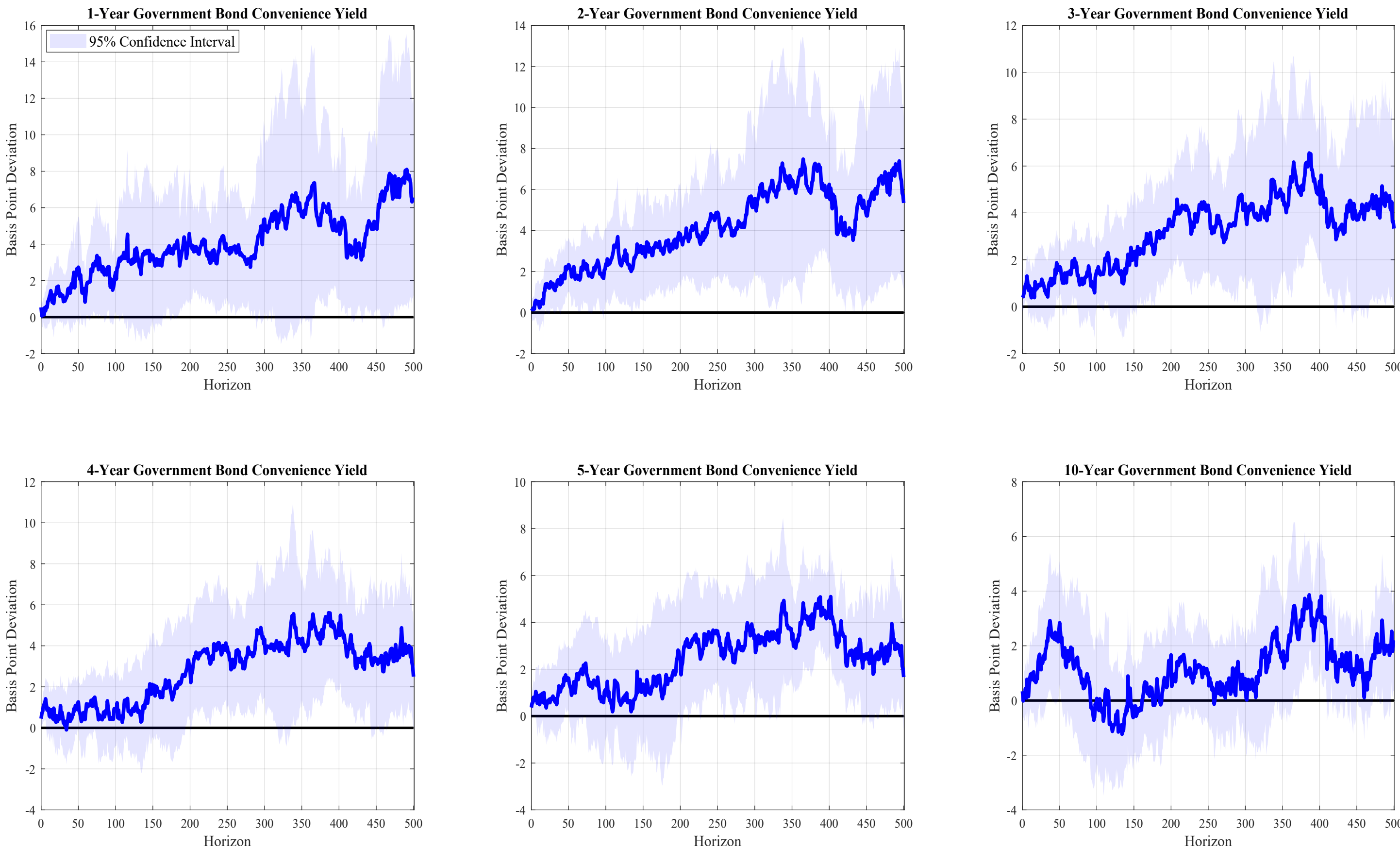

*Notes*: This figure consists of two sub-panels. The left panel presents the time series of the MAKAM Convenience Yield (red line). The right panel presents the time series of the MAKAM rate (blue line) and the TELBOR rate (green line). MAKAM rate data are from the TASE, while TELBOR rate data are from the BOI. The data span the period from 01/01/2017 to 08/31/2022. Time (daily dates) is displayed on the x-axis, and values on the y-axis are in basis points.

Figure 4: **Impulse Responses to GIV Capital Inflow Shock: MAKAM Convenience Yield and FFIs' Accumulated Net Capital Inflows.**



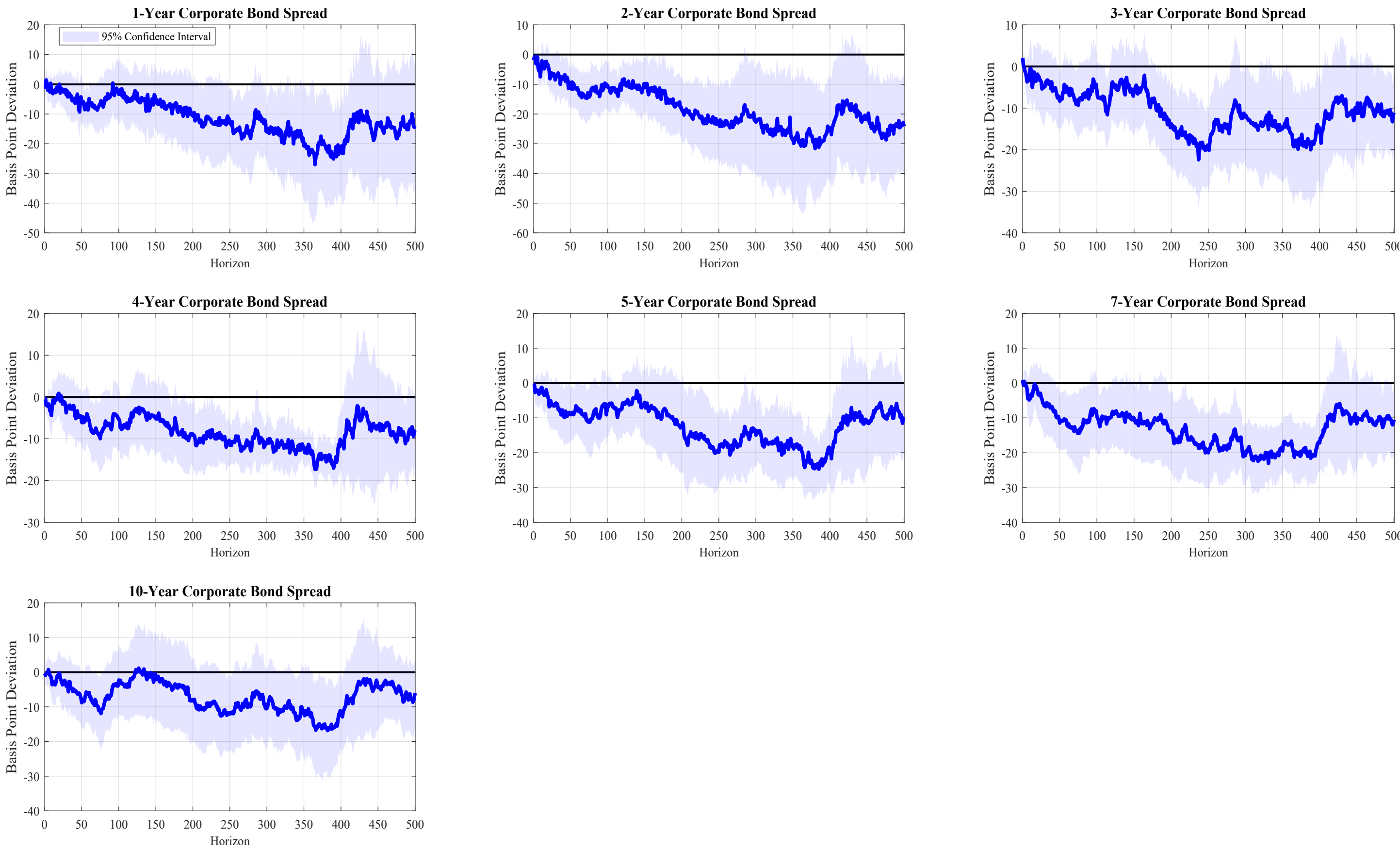

*Notes*: This figure presents the impulse responses (solid lines) to a GIV capital inflow shock of the MAKAM convenience yield and FFIs' accumulated net capital inflows as a share of outstanding MAKAM. Responses are normalized such that the peak response of the latter variable is 10 (i.e., 10-percentage-point share increase), implying a 3.4-standard-deviation GIV capital inflow shock. 95% confidence bands (shaded areas) are based on standard errors computed from the heteroskedasticity- and autocorrelation-consistent procedure of Newey and West (1987), with truncation lag equal to $h+1$ (where $h = 0, 1, ..., 500$ is the local projection horizon). Horizons (trading days) are on the x-axis (impact horizon (0) to 500th horizon). Values for MAKAM convenience yield are in basis point changes relative to the pre-shock value of the convenience yield variable; those for FFIs' accumulated net capital inflows (as a share of outstanding MAKAM) are in percentage-point change units relative to the pre-shock value of FFIs' accumulated net capital inflows (as a share of outstanding MAKAM).

Figure 5: **Impulse Responses to GIV Capital Inflow Shock: Government Bond Convenience Yields.**



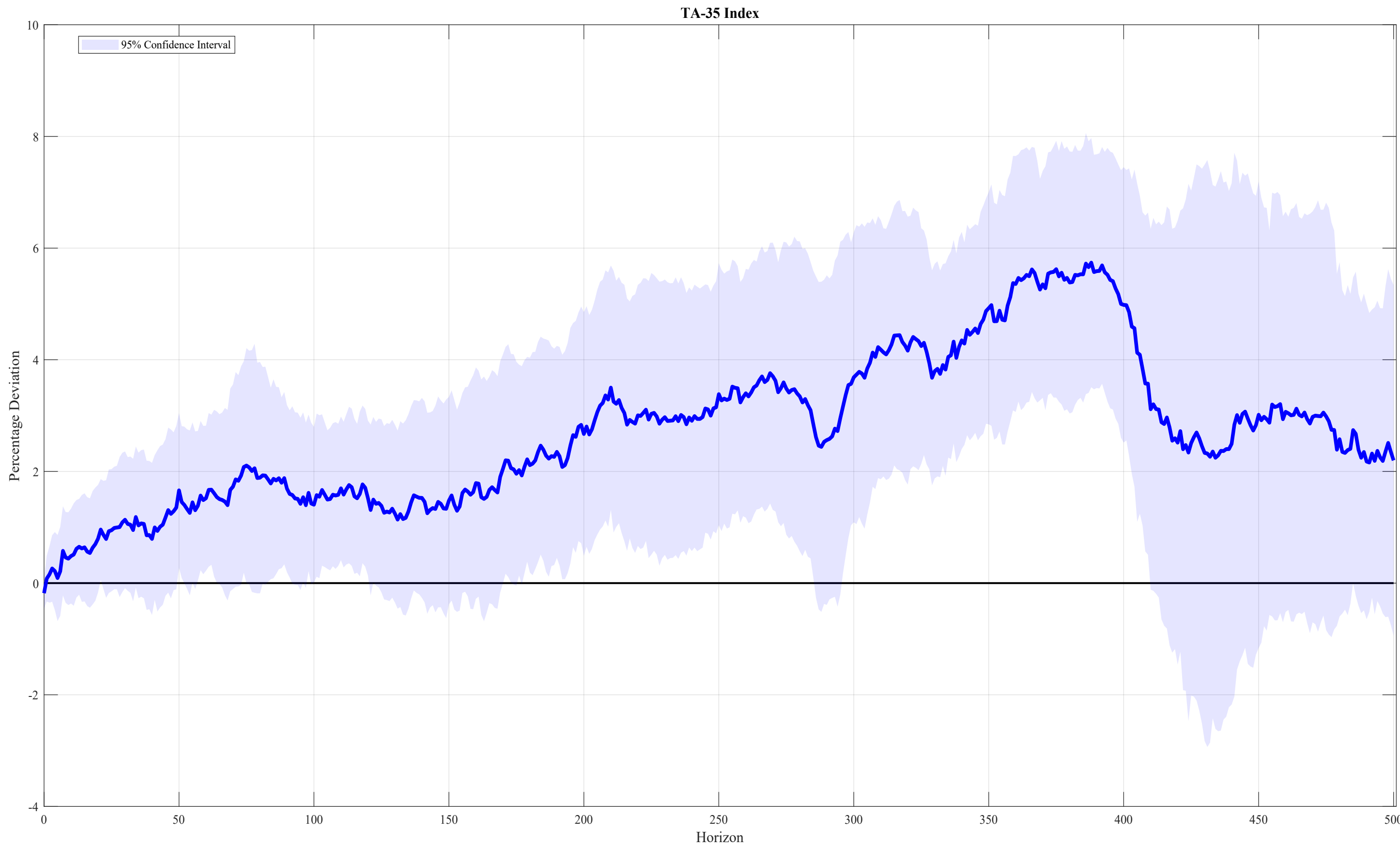

*Notes*: This figure presents the impulse responses (solid lines) to a GIV capital inflow shock of the 1- through 5-year and 10-year government bond convenience yields. Responses are normalized such that the peak response of FFIs' accumulated net capital inflows variable is 10 (i.e., 10-percentage-point increase as a share of outstanding MAKAM), implying a 3.4-standard-deviation GIV capital inflow shock. 95% confidence bands (shaded areas) are based on standard errors computed from the heteroskedasticity- and autocorrelation-consistent procedure of Newey and West (1987), with truncation lag equal to $h + 1$ (where $h = 0, 1, ..., 500$ is the local projection horizon). Horizons (trading days) are on the x-axis (impact horizon (0) to 500th horizon). Values are in basis point changes relative to the pre-shock value of the convenience yield variable.

Figure 6: **Impulse Responses to GIV Capital Inflow Shock: Corporate Bond Yield Spreads.**



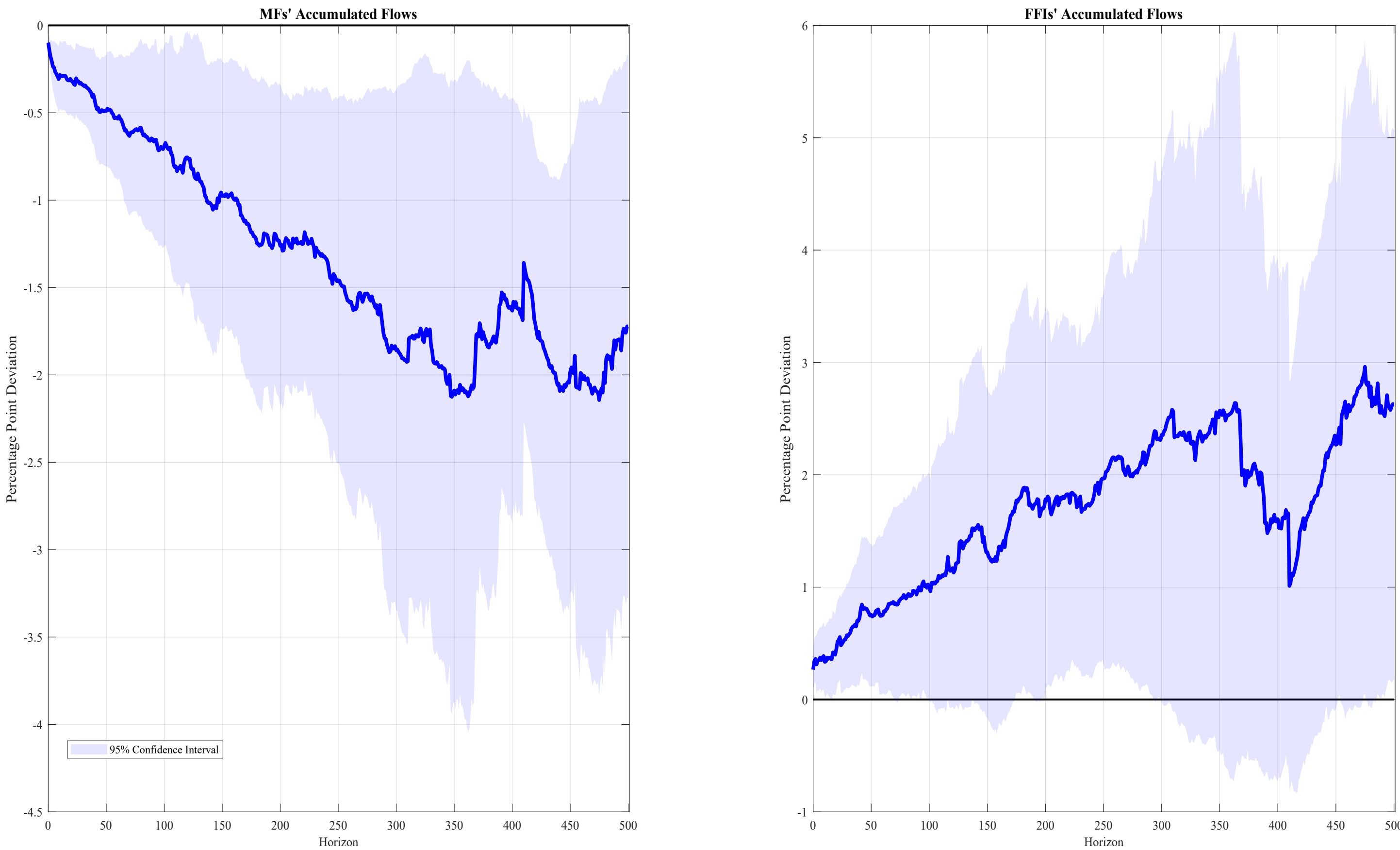

*Notes*: This figure presents the impulse responses (solid lines) to a GIV capital inflow shock of the 1- through 5-year and 7- and 10-year investment-grade corporate bond yield spreads (with respect to maturity-comparable IRS rates). Responses are normalized such that the peak response of FFIs' accumulated net capital inflows variable is 10 (i.e., 10-percentage-point increase as a share of outstanding MAKAM), implying a 3.4-standard-deviation GIV capital inflow shock. 95% confidence bands (shaded areas) are based on standard errors computed from the heteroskedasticity- and autocorrelation-consistent procedure of Newey and West (1987), with truncation lag equal to $h + 1$ (where $h = 0, 1, ..., 500$ is the local projection horizon). Horizons (trading days) are on the x-axis (impact horizon (0) to 500th horizon). Values are in basis point changes relative to the pre-shock value of the spread variable.

Figure 7: **Impulse Responses to GIV Capital Inflow Shock: TA-35 Index.**



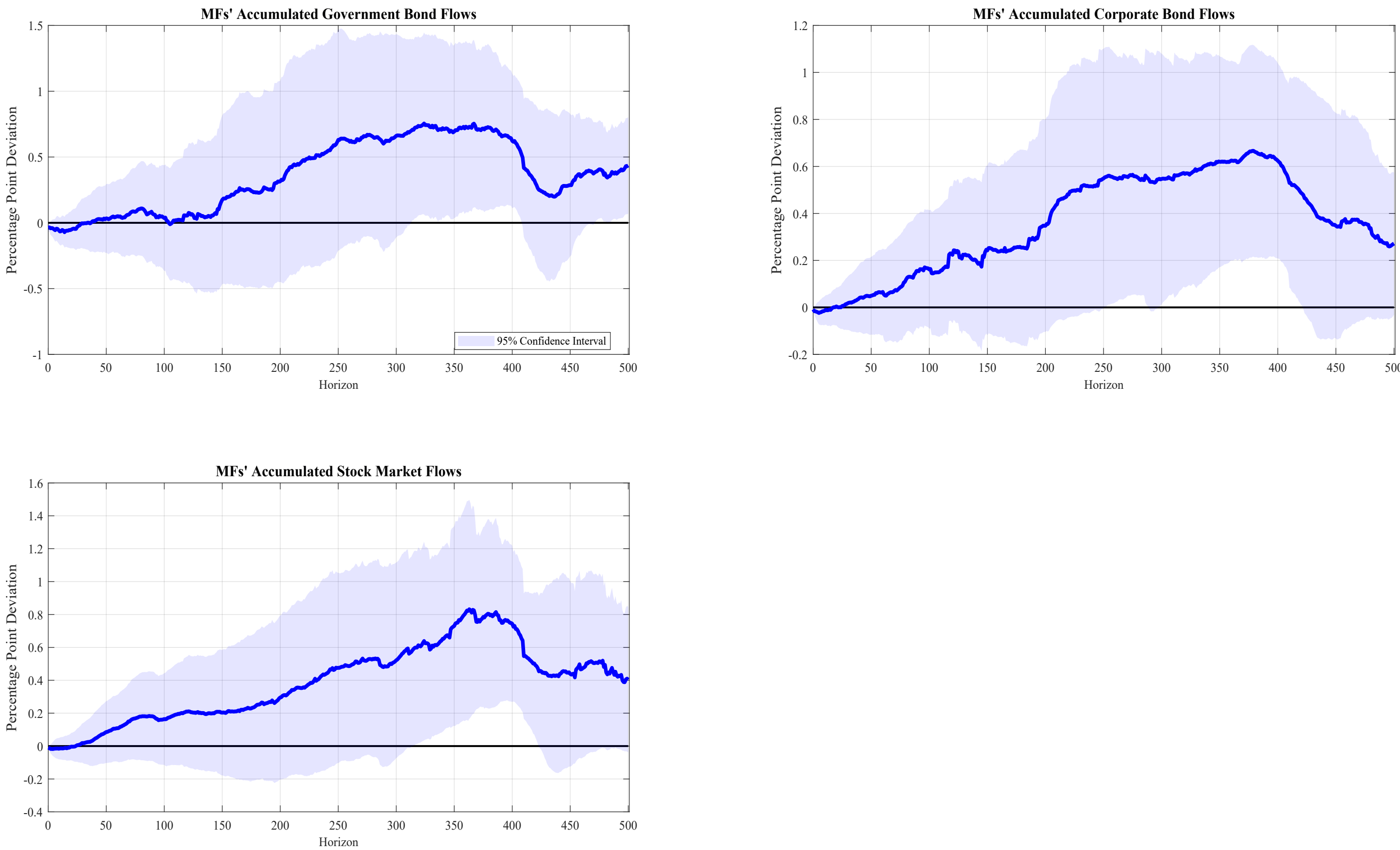

*Notes*: This figure presents the impulse responses (solid line) to a GIV capital inflow shock of the TA-35 stock price index. Responses are normalized such that the peak response of FFIs' accumulated net capital inflows variable is 10 (i.e., 10-percentage-point increase as a share of outstanding MAKAM), implying a 3.4-standard-deviation GIV capital inflow shock. 95% confidence bands (shaded area) are based on standard errors computed from the heteroskedasticity- and autocorrelation-consistent procedure of Newey and West (1987), with truncation lag equal to $h + 1$ (where $h = 0, 1, ..., 500$ is the local projection horizon). Horizons (trading days) are on the x-axis (impact horizon (0) to 500th horizon). Values are in percentage point changes relative to the pre-shock value of the stock price index variable.

Figure 8: **Impulse Responses to GIV Capital Inflow Shock: MFs′ and FFIs′ Accumulated Secondary Market MAKAM Flows.**




*Notes*: This figure presents the impulse responses (solid lines) to a GIV capital inflow shock of MFs′ and FFIs′ accumulated secondary market MAKAM flows as a share of outstanding MAKAM. Responses are normalized such that the peak response of the baseline FFIs′ accumulated net capital inflows variable is 10 (i.e., 10-percentage-point increase as share of outstanding MAKAM), implying a 3.4-standard-deviation GIV capital inflow shock. 95% confidence bands (shaded areas) are based on standard errors computed from the heteroskedasticity- and autocorrelation-consistent procedure of Newey and West (1987), with truncation lag equal to $h + 1$ (where $h = 0, 1, ..., 500$ is the local projection horizon). Horizons (trading days) are on the x-axis (impact horizon (0) to 500th horizon). Values for the two sectors′ accumulated flows variables are in percentage-point changes relative to the pre-shock value of the corresponding sector′s share in outstanding MAKAM bonds.

Figure 9: **Impulse Responses to GIV Capital Inflow Shock: MFs' Accumulated Secondary Market Rebalancing Flows.**




*Notes*: This figure presents the impulse responses (solid lines) to a GIV capital inflow shock of MFs' accumulated secondary market government bond, corporate bond, and equity flows as shares of outstanding MAKAM. Responses are normalized such that the peak response of the baseline FFIs' accumulated net capital inflows variable is 10 (i.e., 10-percentage-point increase as a share of outstanding MAKAM), implying a 3.4-standard-deviation GIV capital inflow shock. 95% confidence bands (shaded areas) are based on standard errors computed from the heteroskedasticity- and autocorrelation-consistent procedure of Newey and West (1987), with truncation lag equal to $h + 1$ (where $h = 0, 1, ..., 500$ is the local projection horizon). Horizons (trading days) are on the x-axis (impact horizon (0) to 500th horizon). Values for the accumulated flows variables (as shares of outstanding MAKAM) are in percentage-point changes relative to the pre-shock value of the corresponding sector's share in outstanding MAKAM bonds.