Internet Appendix

When a Market Changes Hands:
Dollar Funding and the Price of a Domestic Safe Asset

Nadav Ben Zeev Noam Ben-Ze'ev Daniel Nathan

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The Internet Appendix follows the order of the paper. Section IA.1 documents the extracts, the holder statistics, and the bill-by-bill split of holdings behind the account of who held Makam in Section I of the paper. Section IA.2 reports the period estimates, every coefficient of the ownership regression, and the variants that support the relation between foreign ownership and foreign-rate pass-through in Section II. Section IA.3 reports alternative specifications of the comparison of affected and exempt yields after the 2011 reform in Section III. Section IA.4 reports the regressions behind the account of foreign demand in Section IV, the construction and variants of the design based on scheduled hedge maturities, and the year-end pause. Section IA.5 proves Proposition 1, derives the funding-market responses that the hedge-maturity estimates measure, and describes the estimated model of Section V.A. Section IA.6 describes the data and variants for the other bill markets of Section VI. Sections, tables, figures, and equations numbered with the prefix IA are in the Internet Appendix, and all others are in the paper.

Contents

IA.1 Data and holders 2
IA.2 Foreign ownership and foreign-rate pass-through 12
IA.3 The 2011 tax change 19
IA.4 Foreign demand and its price effects 20
IA.5 Funding rates and the Makam yield 37
IA.6 Evidence beyond Israel 46

IA.1 Data and holders

Section I of the paper describes who held Makam as foreign ownership rose and fell, using holdings, transaction, and fund records that the paper introduces briefly. This section lists the extracts, explains the revision of the holder statistics, and splits each sector's change in holdings, bill by bill, into new bills, redemptions, revaluation, and trades.

IA.1.1 Data sources

Table IA.1 lists each extract with its span, coverage, and use. Exit-period fund portfolios come from Praedicta, a commercial provider of Israeli mutual-fund data. Aggregated across funds, their Makam positions reproduce the Bank of Israel's holdings of money-market and other mutual funds over the 72 month-ends of the extract, with a correlation of 0.999 and a root-mean-squared error of ILS 1.82 billion, and over the 14 month-ends from November 2022 to December 2023 with a correlation of 0.99994. The money-market funds alone match the Bank of Israel's money-market-fund aggregate with a correlation of 0.9991. We classify funds by name. Asset lists of retirement savings funds come from Gemel-Net, the public database of Israel's Capital Market, Insurance and Savings Authority, and from the managers' own security lists. They show how concentrated the sector's holdings were. In March 2022 the largest Makam holder held ILS 16.4 billion of the sector's ILS 22.1 billion.

Construction of the paper's tables. In Tables I and II, other domestic holders are Makam outstanding minus reported holdings. The Bank of Israel computed the group as a residual through December 2019 and reports every sector directly from January 2020, and the two reports agree in early 2020. Rates in Table I are weekly means of daily data on days when TELBOR, the Makam yield, and the foreign funding rate are all observed. In Table III, column 5 covers January 2010 to June 2012, when the foreign share stayed below 46%. Column 4 uses Makam yields at 2, 4.5, 7.5, and 11 months with maturity-matched rates over 620 weeks, so week effects leave only differences across maturities within a week. In Table IV, p-values come from a restricted wild cluster bootstrap by security with 200,000 Webb-weight draws and all nuisance coefficients re-estimated, and yields use exact calendar days to maturity. In Table V, rates are means over the final seven calendar days of the previous month, and the two rate coefficients sum to -2.9 (Wald $p = 0.046$, block-bootstrap 95% interval $[-6.1, 3.4]$). Panel B uses remaining-maturity buckets of 1–3, 3–6, 6–9, and 9–12.6 months, with each bucket's hedged spread measured at the bucket midpoint.

Table IA.1: Data extracts

This table reports the data extracts used in the paper and the Internet Appendix. Spans and counts refer to the extracts as received. Coverage gives the number of records or, for fund portfolios, month-ends. Data for the other bill markets are in Section IA.6. Sources: Bank of Israel (transactions, holdings, tenders, and auctions), Praedicta, TASE Smart Money, the Tel Aviv Stock Exchange, and LSEG.

Source	Span	Coverage	Use
Foreign-exchange transactions	2007–2025	960,522 institutional trades	institutions' hedges, scheduled maturities, and rollovers
Spot and forward exchange rates	2008–2026	daily matched-tenor quotes	foreign funding rate
Offshore dollar rates	2008–2026	daily matched-tenor rates	dollar leg of the foreign funding rate
TELBOR and policy rates	1999–2025	daily rates and tender windows	TELBOR
Primary auctions	2011–2026	389 tenders; allocations, yields, value and redemption dates	tender purchases, issue and redemption dates
Interest-rate swap transactions	2017–2025	194,731 transactions	shekel overnight-index swaps
Exchange trades by client type	2014–2026	243,117 bill-day-type records	exchange purchases and sales by investor type
Historical fund portfolios	2008–2017	214,273 holdings records; 1,700 funds	coupon predictors of the estimated model
Earlier extended fund portfolios	2008–2020	769,344 records; 3,470 funds	fund portfolios and classification
Exit-period fund portfolios	2020–2025	72 month-ends	fund holdings, assets, and portfolio weights
Mutual funds by fund type	2017–2022	monthly, part of the sector	passive foreign-equity funds
Deposit tenders	2017–2024	91 months of tender windows	Bank of Israel deposit rate
Sector holdings of Makam	1995–2026	377 months $\times$ 10 sectors	foreign and sector ownership
Exchange end-of-day prices, Makam	2008–2025	27,603 bill-days; 103 bills	bill yields and revaluation of holdings
Exchange end-of-day prices, bonds	1995–2025	89,071 bond-days; 70 bonds	exempt bonds in the 2011 comparison

TELBOR and the Bank of Israel's deposit rates. Section I.C of the paper treats TELBOR as the rate a domestic bank earns on shekels deposited at the Bank of Israel. Figure IA.1 compares overnight TELBOR with the Bank of Israel interest rate and the rate on the Bank of Israel's deposit window, from January 2010 to June 2025. Overnight TELBOR was within 1 basis point of the Bank of Israel interest rate on 99% of the 3834 days, with a mean absolute difference of 0.1 basis points. The deposit window paid 10 to 50 basis points less on most days. Three-month TELBOR, the rate the paper uses, is the fixed rate in a swap on overnight TELBOR, and so the expected rate on deposits at the Bank of Israel over the next three months.

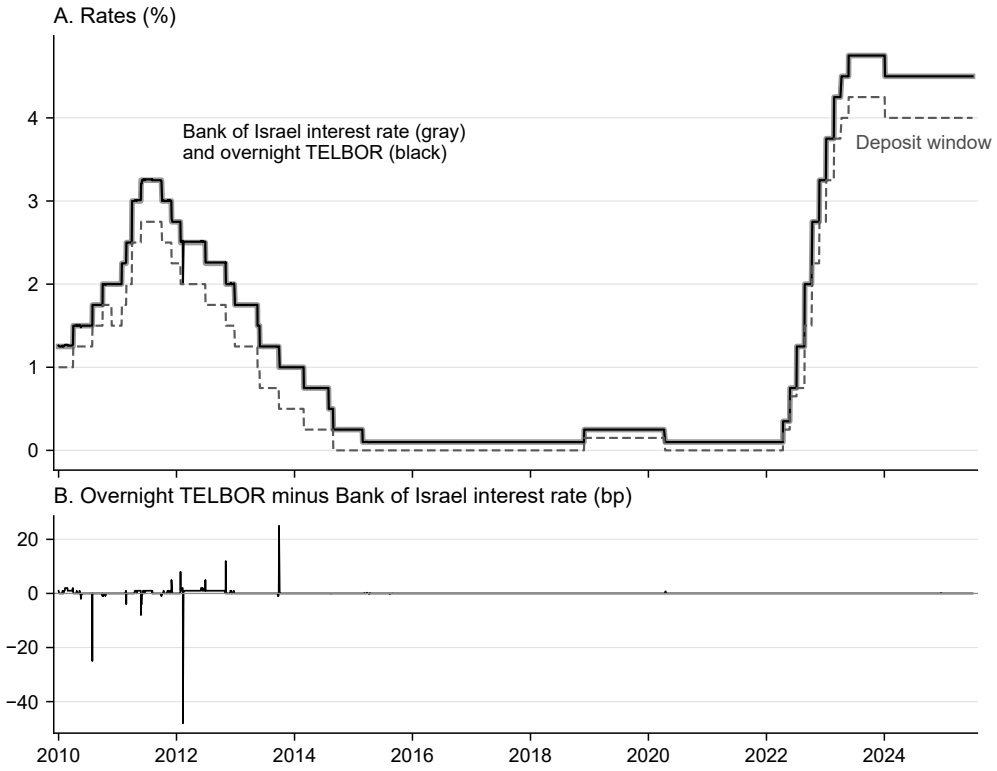


Figure IA.1: **Overnight TELBOR and the Bank of Israel's deposit rates, January 2010 to June 2025.** This figure plots daily rates. Panel A shows overnight TELBOR (black), the Bank of Israel interest rate (gray), and the rate on the Bank of Israel's deposit window (dashed), in percent. Panel B shows overnight TELBOR minus the Bank of Israel interest rate, in basis points. The data come from the Bank of Israel.

IA.1.2 Nonresident Makam purchases and the same institutions' forwards

Figure 2 of the paper matches nonresidents' Makam purchases to the same institutions' dollar forwards. The Bank of Israel's records of foreign transactions and its foreign-exchange data share no identifier, so we match at the level of the parent institution, with a fixed crosswalk of account names for Makam accounts and exact or normalized core names for foreign-exchange counterparties. Ambiguous names stay unlinked, and we drop intra-group legs. Forward positions are outright forwards and FX-swap far legs in shekels against dollars with a tenor of at least 21 days, signed by the customer's side. Makam purchases are tender and secondary purchases at trade date, and net purchases subtract secondary sales. Custodian and omnibus accounts, whose beneficial owners are not observed, made 12.1% of gross purchases and count as unmatched.

From June 2020 to August 2022, institutions with dollar forward positions made 87% of nonresidents' gross Makam purchases. In a weekly panel of the 9 matched institutions over 118 weeks, we regress an institution's new dollar-buying forwards in a week on its net Makam purchases in the same week, with institution and week effects,

$$h_{iw} = \alpha_i + \alpha_w + \beta\, M_{iw} + \varepsilon_{iw}, \tag{IA.1}$$

where h_{iw} is the shekel value of the new dollar-buying forward legs with a tenor of at least 21 days that institution i executes in week w, M_{iw} is its net Makam purchases in the same week, both in ILS billion, and α_i and α_w are institution and week effects. Weeks run from Friday to Thursday. The week effects absorb timing common to all institutions, so β measures each institution's own hedging. The foreign-exchange records cover forwards booked with Israeli banks and institutions, so hedges arranged offshore are not counted and β is a lower bound on the hedged share. An institution's new dollar-buying forwards rise by $\beta = 0.8$ shekels per shekel of its net Makam purchases ($t = 5.0$ with Driscoll–Kraay errors and 4 lags, $t = 5.1$ with errors clustered by institution and week, and wild cluster bootstrap $p = 0.011$ by institution with Webb weights, MacKinnon and Webb (2018)). The slope does not rest on the largest purchase weeks. Figure 2 of the paper groups institution-weeks into twenty equal-count bins of net purchases. Without the 54 institution-weeks in its rightmost bin, $\beta = 1.2$ ($t = 5.9$), and without the 108 in its two extreme bins, $\beta = 1.4$ ($t = 4.9$), with errors clustered by institution and week. The far legs of FX swaps are 97% of the notional of these new dollar-buying forwards. With F_{iw} restricted to swap far legs, $\beta = 0.8$ ($t = 6.2$), and with outright forwards alone, $\beta = 0.04$ ($t = 0.8$), again with errors clustered by institution and week. Every reported statistic pools at least 5 institutions, and no institution is named.

IA.1.3 Revision of the holder statistics

From January 2020 the paper uses the report on Makam holdings by sector that the Bank of Israel introduced in May 2025, and before 2020 the earlier report, which the Bank of Israel keeps as history. For the months both reports cover, the May 2025 report revises bank holdings from January 2020 onward. It also lowers nonresident holdings at the 16 month-ends from September 2022 to December 2023, by ILS 14.3 billion on average in 2023 and by at most ILS 24.1 billion (October 2023), or 7.4 percentage points of the foreign share. Nonresident holdings at all other month-ends are unchanged.

The Bank of Israel attributes the 2023 correction to the removal of double reporting of Makam that banks' repurchase transactions with nonresidents create, and its holdings by bill and holder sector record the correction on a separate line.[1] Bill-level foreign holdings sum to the May 2025 report once the correction line is included. The ownership regression gives the same answer with either report. On the 712 weeks both cover, ending in January 2024, pass-through rises by 8.0 basis points per 10 percentage points of foreign ownership with the May 2025 report ($t = 3.4$) and by 8.1 with the earlier report ($t = 3.5$). With the bank share from the same report added, as in column 3 of Table III, the two estimates are 13.0 ($t = 3.1$) and 11.4 ($t = 2.9$).

IA.1.4 Changes in holdings, bill by bill

For each sector and bill, we split the monthly change in holdings into acquisitions of new and reopened bills, redemptions, revaluation, and net trades in outstanding bills. Redemptions remove the previous month's holdings of maturing bills, and revaluation applies the bill's TASE closing-price return to the previous month's holding. For a reopening, acquisitions subtract the opening holding and its revaluation from the closing holding. Net trades are the residual. A balancing category reconciles reported sector holdings with the market value of the bills, so that net trades sum to zero across sectors. Over the exit, net trades sum to ILS -13.4 billion across reported sectors and ILS $+13.4$ billion in the balancing category, which records accounting and reporting differences that no sector absorbs. The foreign rows reproduce the Bank of Israel's records of foreign transactions (Table IA.2, Panel A).

The records of foreign transactions also split foreign acquisitions by venue (Panel B). From May 2020 to December 2021, the change in foreign holdings exceeds recorded purchases minus sales and redemptions by ILS 3.9 billion, and valuation at TASE month-end prices, settlement-date records, and the removal of duplicate records each change it by at most ILS 0.03 billion. The excess is spread over 31 bills, mostly 2021 bills in their first months,

[1] Bank of Israel statistics staff, personal communication, October 2026.

with 73% in the five largest contributors. Positions reach an international custodian's account through transfers that the records do not show.[2] For the 15 bills whose foreign life lies inside the window, 6% of the ILS 45.4 billion that arrives through those transfers matches no recorded purchase by another foreign account. Results that use holdings do not use the transaction records. For the results that do, placing all of December's excess in the year-end weeks moves the year-end coefficient on foreign net purchases from -0.81 to -0.73 ($t = -8.5$), and adding every positive excess as unrecorded purchases moves the maturity shares of foreign purchases by at most 0.7 percentage points.

IA.1.5 Banks in the accumulation and foreign holders in the exit

Banks were the largest net sellers of outstanding bills as foreign holdings rose. Across bills within a month, we regress each domestic sector's net sales of an outstanding bill on foreign net purchases of the same bill, with month effects and errors clustered by month, over the 18 months from July 2020 through December 2021. Banks sold 0.47 shekels per shekel of foreign net purchases ($t = 2.5$), long-term institutional investors 0.34 ($t = 1.9$), and mutual funds 0.15 ($t = 2.8$). Together the three sectors supplied 96 agorot of each shekel that foreign investors bought, and other holders and the balancing category supplied the rest.

The supervisory balance sheets of the five largest banks show how bank holdings fell to almost nothing.[3] Two banks held 96 percent of the five banks' MAKAM in 2019 and sold one after the other. The second-largest holder cut its MAKAM from ILS 19.3 billion in June 2019 to ILS 3.5 billion in May 2020, and the largest sold from ILS 13.1 billion in May 2020 to ILS 0.9 billion by December 2020. By January 2021 the five largest banks together held ILS 0.4 billion, none more than ILS 0.2 billion. Neither bank sold for lack of liquid assets. Their liquidity coverage ratios rose while they sold, from 121 to 138 percent and from 120 to 132 percent between the fourth quarters of 2019 and 2020, and reserves at the Bank of Israel count toward the ratio as Level 1 assets, as MAKAM does.

Banks kept trading MAKAM after their own holdings were gone. From July 2020 through December 2021, bank holdings of new bills rose by ILS 15.8 billion, ILS 5.2 billion of bank-held bills matured, and banks sold ILS 24.1 billion of outstanding bills on net (Table IA.2, Panel D). Because banks kept intermediating trades after their positions were gone, the estimated model measures bank demand by retained positions.

Foreign holdings fell by ILS 73.3 billion from the November 2022 peak to the trough in

[2]The custodian is Euroclear.

[3]From July 2020 through December 2021, bank holdings fell by ILS 13.6 billion in the holder statistics and the five largest banks' holdings by ILS 13.5 billion in the supervisory data. The two sources differ by ILS 1.6 billion on average in 2021 and diverge further after the Bank of Israel's 2022 revision of bank holdings, so we use the supervisory data only for 2019–2021.

Table IA.2: Foreign transactions and changes in holdings by bill (ILS billion)

This table reports foreign Makam transactions and the changes in holdings by bill of Section IA.1.4. Changes run from the end of the month before each window to the end of its last month. Panel A compares the changes in foreign holdings by bill with recorded foreign transactions, and Panel B splits recorded transactions by venue. Panel C splits the fall in foreign holdings from the November 2022 peak, with the Bank of Israel's repurchase correction on its own line, and Panel D reports domestic sectors. From the November 2022 peak to the November 2024 trough, holdings of new bills replaced 46% of the foreign bills that matured. Holdings are at market value, and entries are rounded separately. Sources: Bank of Israel (holdings, foreign transactions, and tenders) and the Tel Aviv Stock Exchange.

Panel A. Foreign holdings by bill and recorded transactions, February 2020–August 2022

	From holdings	Recorded
Redemptions	134.5	134.6
Net acquisitions before redemptions	183.0	177.0
Monthly correlation of net acquisitions	0.99	

Panel B. Recorded foreign transactions by venue

	Dec 2017–Dec 2019	May 2020–Dec 2021	Mar 2022–Aug 2022
Bought at tenders	11.9	62.3	27.4
Bought in the secondary market	59.4	82.7	54.9
Sold in the secondary market	28.7	59.6	36.1
Redeemed at maturity	33.1	62.3	40.9
Purchases minus sales and redemptions	+9.5	+23.2	+5.3
Change in foreign holdings	+9.3	+27.1	+4.9
Tenders, % of purchases	17	43	33

Panel C. Change in foreign holdings, end-November 2022 to end-November 2024

Holdings of new bills	+51.5
Maturing bills	−111.2
Net sales of outstanding bills	−12.1
Revaluation	+2.7
Change in bill-level foreign holdings	−69.2
Bank of Israel correction line	−4.1
Change in reported foreign holdings	−73.3
Holdings of new bills, % of maturing bills	46

Panel D. Domestic sectors

	Jul 2020–Dec 2021	Dec 2022–Nov 2024
Banks, holdings of new bills	+15.8	+142.2
Banks, net sales of outstanding bills	24.1	103.0
Mutual funds, change in holdings		+89.0
Mutual funds, net purchases of outstanding bills		132.5
Long-term institutional investors, change in holdings		+30.5

November 2024 and rose again to ILS 17.4 billion in April 2025.[4] Most of the fall came from bills that matured without replacement. Foreign holdings of new bills equaled 46 percent of the foreign bills that matured, and the Bank of Israel's correction line, which removes double reporting from repurchase transactions only in aggregate, accounts for ILS 4.1 billion of the fall (Table IA.2, Panel C). The split by bill counts sales in a bill's first month of trading as new bills, so the ILS 12.1 billion of net sales of outstanding bills includes ILS 6.3 billion of exchange sales. Allocating the correction line across bills month by month, with each allocation at most the positive position in a bill, leaves the aggregate fall and the shortfall of foreign exchange sales relative to that fall unchanged.

IA.1.6 Domestic holders after the foreign peak

Section I.D of the paper shows that mutual funds and long-term institutional investors replaced foreign investors as holders of MAKAM. Sector accounts show which holders added bills, and fund portfolios show how mutual funds financed the increase.

From the November 2022 foreign peak through November 2024, domestic holdings rose by ILS 119.5 billion, the ILS 73.3 billion fall in foreign holdings plus the ILS 46.2 billion rise in MAKAM outstanding (Table IA.3, Panel A). Money-market and other mutual funds together added ILS 88.6 billion, and banks raised their holdings temporarily in 2023 and ended close to their level at the peak. Over the exit, mutual funds acquired ILS 451.1 billion of new bills against ILS 501.3 billion of their bills that matured and bought ILS 132.5 billion of outstanding bills on net. They used short bills as a place for cash, holding 69 percent of the value of bills within three months of maturity in 2024 against 38 percent during the accumulation.

For an incumbent fund with holdings $H_{i,t} = A_{i,t}w_{i,t}$, where $A_{i,t}$ is assets under management and $w_{i,t}$ the MAKAM portfolio weight,

$$\Delta H_{i,t} = A_{i,t-1}\Delta w_{i,t} + w_{i,t-1}\Delta A_{i,t} + \Delta A_{i,t}\Delta w_{i,t}. \tag{IA.2}$$

Weight changes and fund growth both contribute to the first-year increase, and fund entry and exit add the rest (Panel B). Passive and index funds account for ILS 34.7 billion of the first-year increase of ILS 72.2 billion.

Funds that held more cash before the exit raised their MAKAM weights more (Panel C). Across continuing funds, each point of initial cash weight raised the MAKAM weight over the

[4] In the earlier report of the holder statistics, nonresident holdings are higher from September 2022 to December 2023 (Section IA.1.3). The November 2022 peak is ILS 2.9 billion higher, and foreign holdings rise by ILS 1.4 billion instead of ILS 0.9 billion from September to December 2022.

exit window by 0.583 points ($t = 51.14$), against 0.111 and 0.098 in the two preceding years. With fund-type effects the slope is 0.586 ($t = 27.72$), across 16 management companies. High-cash funds ran down their cash, and about 86 percent of the differential cash reduction appears as differential MAKAM accumulation. Across continuing funds, cash and deposits account for 73 percent of the offset to a one-point rise in the MAKAM weight. Money-market and passive funds reduced cash weights, while active bond funds reduced other government and corporate-bond weights. Corporate bonds more heavily held by active bond funds that increased their MAKAM holdings show larger declines in quantities during the exit ($t = -3.18$), and equities show no such relation ($t = 0.99$).

IA.1.7 Funds that track foreign stock indices

Israeli mutual funds that track foreign stock indices hold few foreign stocks. They obtain the return of the index through futures and swaps and keep most of their assets in short-term shekel instruments, which also serve as collateral for the derivatives. The fund-level portfolios show the pattern directly. We classify a fund as tracking a foreign stock index when its name identifies it as an index fund and names a foreign index or region, such as the S&P 500 or the NASDAQ 100. The classification is constructed from fund names. In December 2021 the 330 funds so classified managed ILS 43.4 billion. Makam made up 42% of their assets, bank deposits and cash 46%, and foreign stocks and exchange-traded funds held directly 4%. Among the 46 funds with more than ILS 200 million of assets, the median fund held 41% of its assets in Makam. From May 2020 to December 2021 the Makam share of the group's assets stayed between 41% and 53%, while the Makam yield fell below zero in some weeks. In December 2021 these funds held 49% of the Makam in the fund-level portfolios.

Table IA.3: Domestic holders after the foreign peak (ILS billion)

Panel A. Change in holdings by sector, November 2022–November 2024

Money-market funds	+34.8
Other mutual funds	+53.8
Provident funds	+23.5
Pension funds	+7.8
Banks	−1.1
Other sectors and reconciliation residual	+0.7
Total	119.5
Banks, temporary rise to the 2023 maximum	84.4

Panel B. Increase in mutual-fund holdings, November 2022–December 2023

Weight change, continuing funds	27.4
Asset growth, continuing funds	24.9
Asset growth × weight change	17.6
Entry of new funds	3.4
Exit of funds	−1.0
Total	72.2
money-market funds	28.7
passive and index funds	34.7
bond funds other than index funds	0.8
other funds	8.0

Panel C. Change in MAKAM weight per point of initial cash weight

	First earlier window	Second earlier window	After the foreign peak
Initial cash and deposit weight	0.111	0.098	0.583
	(5.03)	(4.88)	(51.14)
R^2	0.013	0.011	0.559
Funds	1944	2095	2066

Notes: Table IA.3 reports the domestic holders that replaced foreign investors after the November 2022 peak. Panel A covers all sectors through November 2024, and Panels B and C cover mutual funds in the fund-level portfolios. Panel A's total equals the fall in foreign holdings plus the rise in MAKAM outstanding, and its last row is the temporary rise in bank holdings, which is not part of the total. Panel B splits the increase among continuing funds into the terms of equation (IA.2) and allocates it across fund types classified by name. Panel C regresses the change in a continuing fund's MAKAM weight on its cash and deposit weight at the start of each window, November 2020–November 2021, November 2021–November 2022, and November 2022–December 2023. Entries are rounded separately. t-statistics in parentheses, clustered by management company. Sources: Bank of Israel and Praedicta.

IA.2 Foreign ownership and foreign-rate pass-through

Section II of the paper shows that the response of the Makam yield to the foreign funding rate rose with foreign ownership. This section reports the period estimates and every coefficient of the ownership regression, and then asks whether the relation survives other samples, maturities, methods of inference, bank holdings, hedging-market conditions, and dollar rates.

IA.2.1 Pass-through by period and the full ownership regression

Table IA.4 estimates equation (2) of the paper. A 100-basis-point rise in the foreign funding rate went with a rise of 7 basis points in the three-month Makam yield from 2018 to 2019, when foreign investors held 9% of Makam, and 28 basis points from January to September 2022, when they held 46%. The ownership regression, evaluated at each period's mean share, gives −2 and 27 basis points for the same two periods. Table IA.5 reports every coefficient of the ownership regression of Table III. In column 3, the bank-share terms enter with a correlation of −0.80 between the lagged bank and foreign shares, and pass-through is evaluated at the period means of both shares, a bank share of 36% from 2018 to 2019 and 4% from January to September 2022. Table IA.6 reports the estimates plotted in Figure 4 of the paper.

Table IA.4: Foreign-rate and TELBOR pass-through by period (bp per 100 bp)

This table reports equation (2) of the paper, the regression of the weekly change in the three-month Makam yield on the weekly changes in three-month TELBOR and the foreign funding rate, with separate intercepts and slopes by period. The sample is weekly, January 2018–September 2024. The fitted row evaluates the ownership regression on the same weeks at the period's mean lagged foreign share. t-statistics in parentheses, Newey–West with 4 lags. Sources: Bank of Israel and LSEG. *, **, and *** denote significance at the 10, 5, and 1% levels, based on the t-statistics shown.

	2018–2019	Jan–Jun 2020	Jul 2020–Dec 2021	Jan–Sep 2022	Oct–Dec 2022	2023	Jan–Sep 2024
Foreign share (%)	9	16	28	46	45	15	3
Foreign-rate pass-through	7	−5**	16***	28**	15	0	12*
	(1.4)	(−2.5)	(4.1)	(2.4)	(0.9)	(−0.1)	(1.9)
Fitted at the period's share	−2	3	13	27	27	3	−6
TELBOR pass-through	59***	73	−222	60*	−22	71***	154*
	(2.9)	(1.5)	(−0.5)	(1.9)	(−0.4)	(6.9)	(1.9)
SD of TELBOR change (bp)	1.3	3.2	0.2	7.0	5.0	7.6	2.3
p, pass-through sums to 1	0.044	0.513	0.481	0.694	0.134	0.035	0.436
Weeks	103	25	77	39	14	52	39

IA.2.2 Variants of the ownership regression

Table IA.7 collects the variants. Each row reports the change in foreign-rate pass-through per 10 percentage points of foreign ownership, the coefficient that the paper translates into the rise from 9 to 46% foreign ownership. In the baseline the coefficient is 7.4 basis points, so the rise in ownership adds about 27 basis points of pass-through.

Sample and inference. A reader may worry that a few years drive the estimate and that Newey–West errors understate its uncertainty. With errors clustered by calendar year, the estimate is 7.4 with a restricted wild cluster bootstrap p-value of 0.003. Ownership is re-centered in each sample, and the bootstrap multiplies residuals by one Rademacher weight per year, refits the regression, and enumerates every weight pattern up to global sign (Roodman et al. (2019)). Omitting one year at a time leaves the estimate between 4.6 and 8.0.

Maturities and observation weeks. The three-month interaction is the largest across the maturities of the Bank of Israel curve, and nine-month forward points and dollar rates are interpolated between six and twelve months. Pooling the three- to twelve-month yields with maturity and week effects gives 10.0 basis points per 10 percentage points ($t = 2.6$). The week-effects regression of column 4 of Table III is reported on all available weeks, on the weeks shared with the five-maturity balanced panel, and without weeks that contain a quarter-end.

Bank holdings. The step in pass-through at a foreign share of 30% in Figure 4 of the paper coincides with banks' exit from Makam. From 2018 to 2024, banks held 4% of Makam in the weeks above that share and 25% in the weeks below. A reader may therefore ask whether bank holdings govern pass-through in place of foreign ownership. From 2010 to 2012 banks still held Makam in the weeks of high pass-through. The foreign-share gradient keeps its size with bank-share terms (9.0, $t = 2.7$) and with bank holdings in shekels (8.9, $t = 3.4$), and it is positive in the weeks in which banks held more than each of three cutoff shares of Makam.

Hedging market and dollar rates. The hedge stock is domestic institutions' outstanding dollar hedges at the end of the previous month. Scheduled maturities count only contracts outstanding before both weeks of the weekly change, traded at least 21 days before maturity. The baseline dollar rate is the LSEG composite three-month dollar overnight-index swap

Table IA.5: The ownership regression: all coefficients (bp per bp)

This table reports every coefficient of equation (3) of the paper. Columns 1–5 of Table III of the paper are columns 1, 2, 4, 6, and 5 here. Samples are weekly through September 2024, and column 5 is monthly, January 2010–June 2012. Shares are in percent and demeaned, and rate changes are in basis points. t-statistics in parentheses, Newey–West with 4 lags (2 in column 5) and Driscoll–Kraay with 4 lags in Panel B. Sources: Bank of Israel and LSEG. *, **, and *** denote significance at the 10, 5, and 1% levels, based on the t-statistics shown.

Panel A. Three-month yield

	(1) 2010–24	(2) 2018–24	(3) 2010–24 excl. Mar–Jun 2020	(4) 2010–24 bank share	(5) 2010–12 monthly
TELBOR change	$+0.71^{***}$	$+0.66^{***}$	$+0.72^{***}$	$+0.72^{***}$	$+0.78^{***}$
	(10.8)	(4.9)	(10.8)	(10.9)	(8.4)
Foreign-rate change	+0.02	$+0.06^{**}$	+0.03	+0.03	−0.02
	(0.7)	(2.2)	(1.1)	(1.2)	(−0.8)
Foreign share × TELBOR change	−0.81	−0.41	−0.81	−0.11	+1.01
	(−1.5)	(−0.4)	(−1.5)	(−0.1)	(1.3)
Foreign share × foreign-rate change	$+0.74^{***}$	$+0.78^{***}$	$+0.69^{***}$	$+0.90^{***}$	$+0.68^{**}$
	(3.3)	(2.9)	(3.0)	(2.7)	(2.3)
Bank share × TELBOR change				+1.20	
				(0.9)	
Bank share × foreign-rate change				+0.29	
				(0.9)	
Observations	747	346	732	747	29

Panel B. Four maturities, maturity and week effects

	(6) 2010–24	(7) 2018–24	(8) bank share
TELBOR change	$+0.62^{***}$	$+0.63^{***}$	$+0.55^{***}$
	(6.7)	(5.5)	(5.2)
Foreign-rate change	$+0.07^{**}$	$+0.14^{***}$	$+0.10^{***}$
	(2.0)	(3.6)	(2.8)
Foreign share × TELBOR change	-1.59^{***}	-1.56^{**}	-2.21^{**}
	(−2.9)	(−2.3)	(−2.4)
Foreign share × foreign-rate change	$+0.93^{***}$	$+0.85^{***}$	$+1.21^{***}$
	(3.9)	(3.0)	(3.9)
Bank share × TELBOR change			−1.26
			(−1.0)
Bank share × foreign-rate change			$+0.56^{*}$
			(1.8)
Observations	2480	1124	2480

Table IA.6: Foreign-rate pass-through by foreign share (bp per 100 bp)

Each column estimates equation (2) of the paper on the weeks in which the foreign share of Makam at the end of the previous month lies in the stated range, with its own intercept, coefficient on TELBOR, and foreign-rate pass-through. The dependent variable is the weekly change in the three-month Makam yield. t-statistics in parentheses, Newey–West with 4 lags. Sources: Bank of Israel and LSEG. *, **, and *** denote significance at the 10, 5, and 1% levels, based on the t-statistics shown.

	2018–2024				2010–2012	
Foreign share (%)	0–10	10–20	20–30	Above 30	0–30	Above 30
Foreign-rate pass-through	7.1	−1.3	4.0	26.7***	−1.8	33.6***
	(1.5)	(−0.5)	(0.7)	(3.4)	(−0.3)	(3.7)
Weeks	115	95	40	96	127	18

(RIC USD3MOIS=) plus 26.161 basis points, the fixed spread ISDA set to replace three-month dollar LIBOR, which brings the dollar rate to the level of unsecured bank funding (footnote 7 of the paper). Without the spread, the weekly change in the foreign funding rate differs from the baseline by at most 0.07 basis points, against a standard deviation of 14.7 basis points. The broker-quoted rate is the ICAP three-month fed funds overnight-index swap (RIC USD3MOIS=ICAP), quoted on 99% of weekdays through the LIBOR-to-SOFR transition.

IA.2.3 Passive funds and the components of the foreign funding rate

Two further objections concern domestic portfolios and the funding rate itself. Passive foreign-equity funds expanded their Makam holdings during the accumulation (Section II.A of the paper), so the foreign share could stand in for their demand. On the 289 weeks with observed passive holdings, adding the lagged passive share and its interactions with both rate changes leaves the foreign interaction at 14.5 ($t = 1.7$). The lagged passive share has a correlation of +0.85 with the lagged foreign share and −0.92 with the lagged bank share, and the foreign share keeps 45% of its standard deviation after a linear projection on both. The foreign funding rate combines the dollar rate and the hedging component, and either could carry the relation. Interacted separately with the foreign share, the hedging component gives 7.2 ($t = 3.4$) and the dollar rate 2.7 ($t = 0.2$).

Table IA.7: Variants of the ownership regression: change in foreign-rate pass-through per 10 percentage points of foreign ownership (bp per 100 bp)

This table reports the ownership regression of equation (3) of the paper with one element changed in each row. The sample is weekly through September 2024, from January 2010 unless the row says otherwise and from January 2018 for the bank-share states. Maturity rows use maturity-matched TELBOR and foreign funding rates. Added state variables enter demeaned, alone and interacted with both rate changes, and bank-share states have their own intercepts, rate slopes, and ownership terms. t-statistics are Newey–West with 4 lags, Driscoll–Kraay with 4 lags for pooled maturities, and CR1 by year with a restricted wild cluster bootstrap in the clustered row. Sources: Bank of Israel and LSEG. *, **, and *** denote significance at the 10, 5, and 1% levels, based on the t-statistics shown.

	Estimate	t	Weeks
Panel A. Sample and inference, three-month yield			
Baseline, January 2010–September 2024	7.4^{***}	3.3	747
January 2018–September 2024	7.8^{***}	2.9	346
Excluding March–June 2020	6.9^{***}	3.0	732
Errors clustered by year, wild bootstrap p in brackets	7.4^{***}	[0.003]	747
Panel B. Maturity and observation weeks			
One-month yield	3.6	1.5	645
Six-month yield	1.1	0.4	672
Nine-month yield	3.1	1.3	649
Twelve-month yield	3.1	1.3	769
Three to twelve months, maturity and week effects	10.0^{***}	2.6	769
Four maturities, week effects, all weeks	9.3^{***}	3.9	620
weeks shared with the five-maturity panel	3.6	1.6	395
excluding quarter-end weeks	10.6^{***}	4.2	569
Panel C. Bank holdings			
Bank-share terms, 2010–2024	9.0^{***}	2.7	747
Bank-share terms, 2018–2024	8.1^{**}	2.3	346
Bank holdings in ILS 10 billion, 2010–2024	8.9^{***}	3.4	747
Weeks with bank share above 3.0%	9.4^{***}	2.7	70
at or below 3.0%	2.1	0.3	64
Weeks with bank share above 5.0%	5.9^{**}	2.1	216
at or below 5.0%	5.1^{*}	1.7	91
Weeks with bank share above 7.5%	8.8^{***}	4.7	206
at or below 7.5%	1.8	0.7	100
Panel D. Hedging market, dollar rates, and passive funds			
Hedge-stock terms, 2010–2024	7.2^{***}	2.8	747
Hedge-stock terms, 2018–2024	7.8^{*}	1.8	346
Scheduled-maturity terms, 2019–2022	9.2^{***}	2.6	185
Dollar rate without the 26.161 bp spread	7.4^{***}	3.3	747
Broker-quoted dollar rate	7.1^{***}	3.1	747
Passive-share and bank-share terms, Feb 2017–Sep 2022	14.5^{*}	1.7	289
Dollar-rate component of the foreign funding rate	2.7	0.2	747
Hedging component of the foreign funding rate	7.2^{***}	3.4	747

IA.2.4 The level of interest rates

Three-month TELBOR rose from 1.02% from January to September 2022 to 4.61% in 2023 (Table I of the paper), so pass-through could have risen with the level of rates rather than with foreign ownership. Table IA.8 adds the previous week's three-month TELBOR, demeaned, and its interactions with both rate changes to equation (3) of the paper. The foreign-ownership interaction is 7.4 ($t = 3.2$) against 7.4 without the level terms, and 7.8 ($t = 2.9$) from 2018. The interaction of the foreign funding rate with the level of TELBOR is close to zero in every column, including without the foreign-share terms. The lagged foreign share and the lagged level of TELBOR have a correlation of +0.12 from 2010 to 2024 and −0.19 from 2018, because in both episodes rates were highest after foreign investors had left.

Table IA.8: The ownership regression with the level of TELBOR

This table reports equation (3) of the paper for the weekly change in the three-month Makam yield, through September 2024. Columns (1) and (4) reproduce Table III of the paper, columns (1) and (2). Columns (2) and (5) add the previous week's mean three-month TELBOR (percent, demeaned), its interactions with the changes in TELBOR and the foreign funding rate, and its level. Columns (3) and (6) include the TELBOR-level terms without the foreign-share terms. θ_F and θ_D are in basis points per 100 basis points, the foreign-share interactions in basis points per 100 basis points per 10 percentage points of foreign ownership, and the TELBOR-level interactions in basis points per 100 basis points per percentage point of TELBOR. t-statistics in parentheses use Newey–West standard errors with four lags. Sources: Bank of Israel and LSEG. *, **, and *** denote significance at the 10, 5, and 1% levels, based on the t-statistics shown.

	2010–2024			2018–2024		
	(1)	(2)	(3)	(4)	(5)	(6)
θ_F, foreign funding rate	2	1	9^{**}	6^{**}	6^{**}	11^{**}
	(0.7)	(0.6)	(2.3)	(2.2)	(2.2)	(2.2)
θ_D, TELBOR	71^{***}	74^{***}	67^{***}	66^{***}	59^{*}	60^{***}
	(10.8)	(8.1)	(6.2)	(4.9)	(1.9)	(2.9)
γ_F, foreign funding rate × foreign share	7.4^{***}	7.4^{***}		7.8^{***}	7.8^{***}	
	(3.3)	(3.2)		(2.9)	(2.9)	
γ_D, TELBOR × foreign share	−8.1	−8.2		−4.1	−3.3	
	(−1.5)	(−1.5)		(−0.4)	(−0.3)	
Foreign funding rate × lagged TELBOR		0.4	1.1		1.0	0.9
		(0.2)	(0.6)		(0.5)	(0.4)
TELBOR × lagged TELBOR		−2.3	−2.7		1.8	1.2
		(−0.4)	(−0.4)		(0.2)	(0.1)
Foreign-share terms	Yes	Yes	No	Yes	Yes	No
TELBOR-level terms	No	Yes	Yes	No	Yes	Yes
Weeks	747	747	747	346	346	346

IA.3 The 2011 tax change

Section III of the paper shows that affected Makam cheapened relative to exempt securities after the 2011 reform moved the bills from foreign holders to banks. Table IA.9 asks whether the comparison depends on the maturity control, the maturity window, or the start of the sample. In the baseline, affected yields rose by 12.8 basis points relative to exempt yields, and the estimate stays between 7.5 and 22.3 basis points across the alternatives. Leaving out one exempt bond at a time, the column 1 estimate ranges from 10.7 to 16.6 basis points. With the post period starting in each month from January 2010 to January 2012, the actual date ranks 4 of 25. Every specification measures yields with exact calendar days to maturity.

Table IA.9: Yields on affected and exempt securities after the 2011 reform: alternative specifications (bp)

This table reports equation (4) of the paper, the regression of the security-month mean yield on an indicator for affected Makam after 7 July 2011, with security and calendar-month effects. Samples end in June 2012. Rows vary the maturity control, which interacts remaining maturity with month indicators, adds its square, or uses one common slope, the remaining-maturity window, and the sample start. t-statistics are clustered by security and month, and wild p-values come from a restricted wild cluster bootstrap by security with 200000 draws. Sources: Bank of Israel and the Tel Aviv Stock Exchange. *, **, and *** denote significance at the 10, 5, and 1% levels, based on the t-statistics shown.

	Maturity control	Months to maturity	Sample start	Affected × post	t	Wild p	Affected / exempt	Security-months
(1)	Month-specific linear	1–24	Jul 2009	12.8***	3.78	0.015	47 / 7	515
(2)	Month-specific quadratic	1–24	Jul 2009	10.9***	4.90	0.019	47 / 7	515
(3)	Common linear	1–24	Jul 2009	22.3***	4.06	0.002	47 / 7	515
(4)	Month-specific linear	1–12	Jul 2009	13.9***	4.07	0.002	47 / 5	458
(5)	Month-specific linear	1–18	Jul 2009	10.9***	4.43	0.010	47 / 6	484
(6)	Month-specific linear	3–24	Jul 2009	7.5***	5.35	0.007	45 / 7	442
(7)	Month-specific linear	1–24	Apr 2010	12.9***	3.69	0.016	38 / 6	395
(8)	Month-specific linear	1–24	Jul 2010	12.6***	3.61	0.015	35 / 6	353

IA.4 Foreign demand and its price effects

Section IV of the paper shows that foreign investors respond to the hedged spread, that their purchases follow the calendar of domestic institutions' maturing currency hedges, that scheduled hedge maturities move the Makam yield through the foreign funding rate and foreign purchases, and that foreign buying pauses at year-end. This section reports the regressions behind each statement and the construction and variants of the design based on scheduled hedge maturities.

IA.4.1 What foreign investors respond to

A reader may ask whether the predictive regression of Table V, picks up the domestic rate instead of the foreign funding rate. Adding lagged TELBOR leaves the coefficient on the lagged foreign funding rate at -8.4 billion shekels per 100 basis points ($t = -5.8$), against -8.6 without it (Table IA.10, Panel A). The coefficient on the lagged Makam yield falls to 2.2 ($t = 0.9$) because the Makam yield and TELBOR move together, with a correlation of 0.82 within episodes, so the regression cannot divide the response to the shekel rate between them. The two coefficients sum to 5.2 ($t = 4.3$), close to the 5.7 on the Makam yield alone. A second question is whether maturity choice reflects the hedged spread or the exchange as a venue. Within the exchange, foreign purchases shift toward buckets with a higher hedged spread by 0.77 ($t = 1.9$), and the pairwise differences from each domestic group appear in Panel B. Panel C shows that domestic institutions renew their maturing hedges. Institutions renew 84% of the hedges scheduled to mature in a week, in that week or the week before ($t = 10.5$), and maturities scheduled 14 weeks ahead predict no rollover. Each renewal is a new forward sale of dollars, the opposite side of the forward purchase that a hedged foreign buyer makes.

IA.4.2 Deviations from covered interest parity in Israel, the euro area, and Japan

A bank that funds in dollars can earn a deviation from covered interest parity in many currencies. Table IA.11 and Figure IA.2 compare TELBOR minus the foreign funding rate with the same deviation in euros and yen. For each currency, the deviation is the three-month overnight-index-swap rate in that currency minus the foreign funding rate in that currency, constructed as in equation (1) of the paper with the same dollar rate and spread.

From 2018 to 2019 Israel's deviation was close to the deviations in euros and yen, and foreign investors held 9% of Makam on average. From July 2020 to December 2021 the

Table IA.10: Foreign demand: lagged benchmarks, maturity choice, and hedge rollovers

This table reports three regressions behind Section IV.A of the paper. Panel A is the predictive regression of Table V, on the same 50 months with episode intercepts, lagged foreign holdings, and the institutional hedge stock. Panel B regresses each group's share of monthly exchange purchases in a remaining-maturity bucket on the bucket's hedged spread in the previous month, with month and bucket effects, February 2018–August 2022, and compares foreign investors with each group in stacked regressions. Panel C regresses domestic institutions' executed rollovers on the hedges scheduled to mature, with indicators for redemption, tender, month-end, and quarter-end weeks. In Panel C, 84 cents of each maturing dollar are rolled. t-statistics in parentheses, Newey–West within episodes in Panel A, clustered by month in Panel B, and Newey–West with 4 lags in Panel C. Sources: Bank of Israel, TASE Smart Money, and LSEG. *, **, and *** denote significance at the 10, 5, and 1% levels, based on the t-statistics shown.

Panel A. Monthly change in foreign holdings (ILS bn per 100 bp of a lagged rate)

	Original	Adding TELBOR
Lagged Makam yield	5.7^{***}	2.2
	(4.1)	(0.9)
Lagged foreign funding rate	-8.6^{***}	-8.4^{***}
	(−5.6)	(−5.8)
Lagged TELBOR		2.9
		(1.4)

Panel B. Exchange purchases by maturity bucket and the hedged spread

	Slope	Foreign minus group
Foreign investors	0.77^{*}	
	(1.9)	
Banks	1.14^{***}	−0.38
	(3.2)	(−0.9)
Mutual funds	−0.12	0.89^{**}
	(−0.8)	(2.1)
Pension funds and insurers	−0.04	0.81^{**}
	(−0.3)	(2.1)
ETFs and market makers	−0.29	1.06^{**}
	(−1.5)	(2.4)

Panel C. Hedge rollovers in weeks $w-1$ and w (USD bn per USD bn)

	2019–2022	Jan 2019–May 2020	Jun 2020–Aug 2022
Hedges scheduled to mature in week w	0.84^{***}	0.96^{***}	0.83^{***}
	(10.5)	(10.6)	(8.8)
Hedges scheduled 14 weeks ahead	+0.03	$+0.20^{*}$	−0.04
	(0.4)	(1.8)	(−0.4)
Weeks	191	75	116

deviations in euros and yen fell to 0 and 4 basis points, Israel's stayed at 30, and the foreign share averaged 28%. From January 2010 to June 2011, when foreign investors first entered, Israel's deviation of 105 basis points also exceeded those in euros and yen. Across the 24 quarters from 2017 to 2022, the foreign share of Makam has a correlation of 0.85 with Israel's deviation minus the larger of the deviations in euros and yen, and of 0.66 with Israel's deviation alone. From 2010Q1 to 2024Q3 the two correlations are 0.67 and 0.62.

Table IA.11: Three-month deviations from covered interest parity (basis points)

This table reports means of weekly means over the periods of Table I of the paper. Each deviation is the three-month overnight-index-swap rate in the currency minus the foreign funding rate in that currency, the rate at which an investor that borrows dollars at the three-month dollar overnight-index-swap rate plus 26.161 basis points obtains the currency through a three-month forward. For Israel the local rate is three-month TELBOR, for the euro area EONIA and later ESTR, and for Japan the yen overnight rate. The foreign share is the foreign share of Makam outstanding. Sources: Bank of Israel and LSEG.

	Israel	Euro area	Japan	Foreign share (%)
Jan 2010–Jun 2011	105	−4	−1	22
2018–2019	27	22	35	9
Jul 2020–Dec 2021	30	0	4	28
Jan–Sep 2022	95	1	8	46
2023	85	1	22	15
Jan–Sep 2024	57	−10	12	3

IA.4.3 Foreign shares of other Israeli markets

Figure IA.3 plots the share of each Israeli securities market that nonresidents held from January 2017 to August 2022. Their share of government debt with up to one year to maturity rose from 4% to 41%, and peaked at 46% in June 2022. Their share of government bonds with more than one year to maturity rose from 10% to 16%, their share of Israeli equities from 16% to 20%, and their share of corporate bonds stayed at or below 1%.

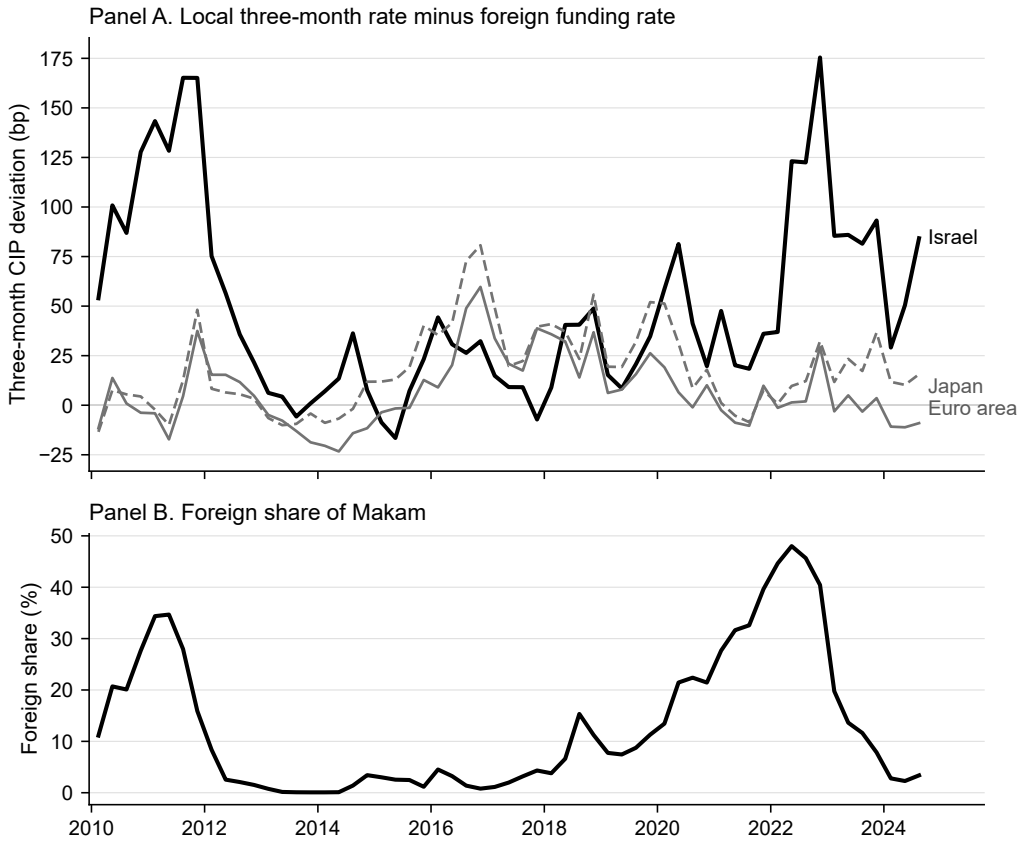


Figure IA.2: **Deviations from covered interest parity and the foreign share of Makam, 2010Q1 to 2024Q3.** Panel A plots quarterly means of the three-month deviation in Israel (black), the euro area (gray), and Japan (dashed), in basis points, constructed as in Table IA.11. Panel B plots the quarterly mean of the foreign share of Makam outstanding, in percent. Sources: Bank of Israel and LSEG.

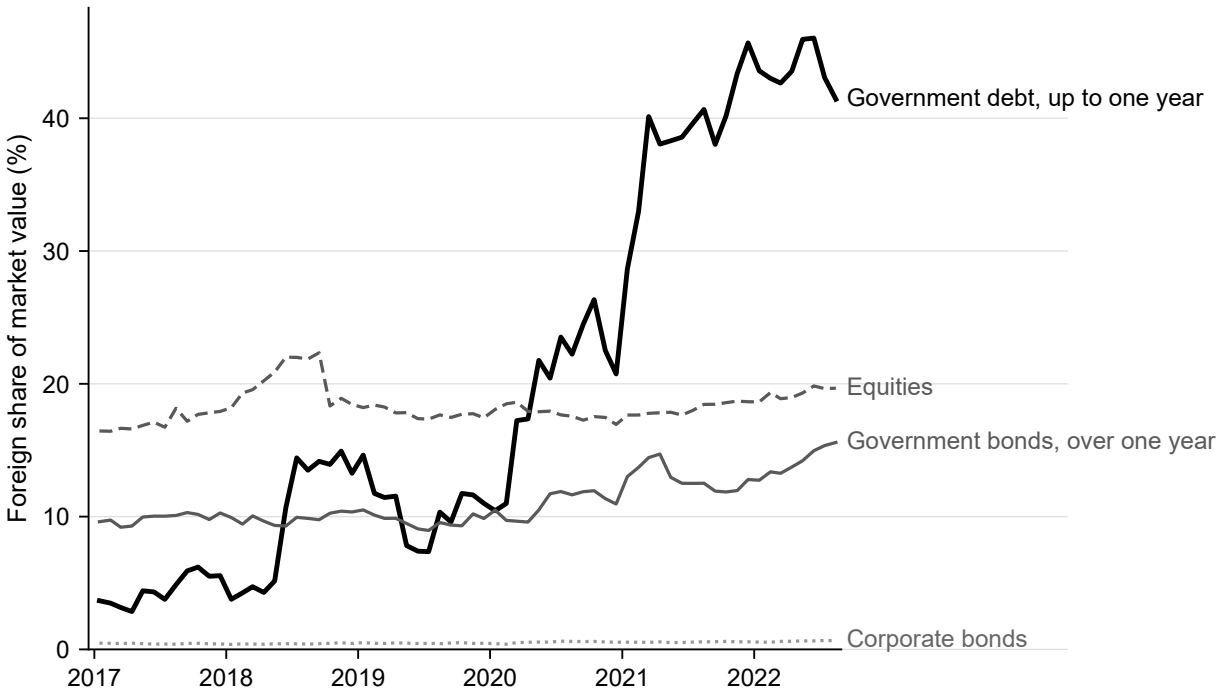


Figure IA.3: **Foreign shares of Israeli securities markets, January 2017 to August 2022.** This figure plots the monthly share of the market value of each market held by nonresidents, in percent. Government debt with up to one year to maturity comprises Makam and government bonds with up to one year remaining. Government bonds with more than one year to maturity are the remaining government bonds. Source: Bank of Israel.

IA.4.4 Israel's credit risk and the foreign exit

Table IA.12 compares the foreign exit from Makam with Israel's credit risk and with foreign trading in government bonds. Credit risk is measured by the daily closing five-year credit default swap spread on Israel's dollar government debt, from ICE through Bloomberg as published by the Bank of Israel. From September–October 2022 to September 2023 foreign holdings of Makam fell from ILS 72.6 billion to ILS 37.0 billion and the foreign share from 46% to 12%, while the credit default swap spread rose from 40 to 52 basis points.

Panel B reports foreign net purchases of government securities on the Tel Aviv Stock Exchange by remaining maturity. Over the first step foreign investors sold nominal bonds with less than two years to maturity, which a hedged investor holds for the same return as Makam, and bought nominal bonds with more than five years. From December 2022 to September 2023 the sales of short bonds came to ILS 14.1 billion and the purchases of long bonds to ILS 12.1 billion. The purchases of long bonds raised the nonresident share of tradable government bonds from 12.2% to 13.9%.

In October 2023, after the outbreak of war, the credit default swap spread rose by 79 basis points. From then to April–June 2024 foreign holdings of Makam fell to ILS 5.7 billion and the nonresident share of government bonds to 8.3%, while foreign investors bought ILS 8.7 billion of long nominal bonds on the exchange from October 2023 to March 2024. Across the 51 months from June 2020 to August 2024, the monthly change in the spread has a correlation of -0.13 with the change in the foreign share of Makam, -0.05 with foreign purchases of Makam relative to foreign holdings in the previous month, and 0.01 with the change in the nonresident share of government bonds.

IA.4.5 Scheduled hedge maturities

Section IV.B of the paper uses domestic institutions' scheduled hedge maturities as an instrument for the foreign funding rate and for foreign acquisitions. This subsection defines the design, lists its controls, and reports the checks that a reader of Table VII will want.

Design. The instrument is the reported USD notional of domestic institutions' dollar-sale forwards, including FX-swap far legs, scheduled to mature in week w and traded at least 97 days before the start of that week, from the Bank of Israel's transaction-level foreign-exchange data. Prices change from week $w-3$ to week w, and foreign acquisitions are tender and secondary purchases minus secondary sales, before redemptions, over weeks $w-2$ to w. Table VII controls for maturities scheduled 14 weeks ahead, built from contracts written before week $w-3$ with the same selection, and for foreign redemptions in week w, indicators for tenders, month-ends, and quarter-ends, period intercepts, a quadratic trend, and month-

Table IA.12: Credit risk, foreign holdings, and foreign trading, 2022 to 2024

Panel A reports means of monthly values over each period. The credit default swap spread is the five-year spread on Israel's dollar government debt, the monthly mean of daily closes, in basis points. Foreign Makam is nonresident holdings of Makam at market value, in ILS billion, and the foreign share is that amount as a share of Makam outstanding. The bond share is the nonresident share of tradable government bonds at market value. Panel B reports foreign net purchases on the Tel Aviv Stock Exchange summed over each period, in ILS billion at market value. Purchases at auctions are not included. Short, medium, and long are nominal fixed-rate bonds with less than two, two to five, and more than five years to maturity on the trade date. Sources: Bank of Israel, ICE through Bloomberg, and TASE Smart Money.

Panel A. Credit risk and foreign holdings

	Credit default swap (bp)	Foreign share of Makam (%)	Foreign Makam (ILS bn)	Bond share (%)
Sep–Oct 2022	40	46	72.6	12.2
Dec 2022–Mar 2023	49	23	54.6	12.6
Sep 2023	52	12	37.0	13.9
Oct–Dec 2023	116	8	24.9	12.4
Apr–Jun 2024	129	2	5.7	8.3

Panel B. Foreign net purchases on the exchange (ILS bn)

		Nominal bonds			CPI-linked
	Makam	Short	Medium	Long	bonds
Sep–Oct 2022	−1.7	−6.5	0.1	1.5	−2.2
Dec 2022–Mar 2023	1.6	−9.5	−0.8	3.9	1.9
Apr–Sep 2023	−13.4	−4.6	−0.5	8.2	1.4
Oct 2023–Mar 2024	−1.6	0.7	0.7	8.7	3.7

of-year and week-of-month effects. It also controls for foreign and bank Makam holdings before the window, the weekly hedge stock at the end of week $w-3$, the weekly changes in the three-month Makam yield, foreign funding rate, TELBOR, USD/ILS exchange rate, and dollar interest rate before the window, Makam issuance and redemptions over weeks $w-2$ and $w-1$, and an indicator for 2022. Table IA.15 adds the month-end hedge stock before week $w-2$ and TELBOR minus the foreign funding rate in week $w-3$. Every column adds the change in TELBOR at the same maturity over the pricing window. The sample is the weeks ending 11 June 2020 to 25 August 2022, and Anderson–Rubin sets invert a HAC test with 8 Newey–West lags that respect gaps in the weekly series.

Funding-rate exposure and price impact. Columns (1)–(3) of Table VII instrument the change in the foreign funding rate with scheduled maturities and read the response of the Makam yield as funding-rate exposure, and columns (4)–(6) read the same shift in swap supply as price impact per shekel of foreign acquisitions (Section IA.5.2). Both readings require that scheduled maturities reach the Makam market only through the foreign funding rate and foreign holdings. A Bank of Israel rate decision can move TELBOR and the foreign funding rate in the same week. Indicators for the pricing windows that contain one of the 4 weeks in which overnight TELBOR moved by at least 10 basis points (weeks ending 14 April 2022, 26 May 2022, 7 July 2022, and 25 August 2022) leave the estimates close to Table VII. A 100-basis-point fall in the instrumented foreign funding rate lowers the three-month Makam yield by 20 basis points ([5, 41]) and the six-month yield by 20 ([6, 55]), and price impact is 3.16 basis points per ILS billion at three months ([0.93, 6.89]) and 2.47 at six months ([0.97, 8.05]).

Domestic holders and issuance. The exclusion fails if heavy maturity weeks shift domestic demand or issuance directly. In the six-month design of Table VII, with outcomes over weeks $w-2$ to w, long-term institutional investors (pension funds, retirement savings funds, and insurers) sell ILS 0.29 billion of Makam on the exchange per USD billion of scheduled maturities ($t = 3.4$), and foreign investors buy ILS 0.31 billion ($t = 2.3$). Mutual funds' net exchange purchases change by ILS -0.09 billion ($t = -1.1$), banks' own-account purchases by ILS 0.13 billion ($t = 1.7$), and net issuance, tender sales minus redemptions, does not respond ($t = -0.5$). The sales of long-term institutional investors are a movement along domestic supply. They are the same whether, at the spot rate of week $w-3$, the maturing hedges leave the institution owing or receiving shekels ($t = -0.04$ for the difference), so settlement cash does not drive them.

Contract age and the lead control. Panel A of Table IA.16 varies the minimum contract age from 30 to 150 days, each cutoff with its own 14-week lead, and the 97-day row is the design of Table VII. The six-month estimate is positive at every cutoff, with a bounded positive Anderson–Rubin set at 60, 90, and 97 days. With the hedge stock and the funding gap added, the set stays bounded and positive at 90 and 97 days. The lead counts contracts executed before week $w-3$ that meet the age cutoff for their own maturity week. Panel B restricts it to contracts written before week $w-2$, applies only each future week's age cutoff, or drops it, and adds issuance and redemptions over the acquisition window. The six-month price impact stays between 2.46 and 2.67 basis points per ILS billion.

Price impact pooled across maturities. The three- and six-month designs of Table VII share their weeks, instrument, and foreign acquisitions, and their price impacts are 2.44 and 3.16 basis points per ILS billion. Stacking the two regressions, each with its own controls, with one price impact for both yields gives 2.80 basis points ($t = 5.0$) over 114 weeks. Newey–West standard errors with 8 lags sum the two regressions' influence within each week. The Anderson–Rubin set inverts the test that the common coefficient of scheduled maturities on the yield change net of the hypothesized price impact times acquisitions is zero. The 95% set is [1.81, 4.41], the 97.5% set [1.66, 4.85], and the 90% set [1.97, 4.03].

The control for 2022. Table VII controls for 2022 with one indicator. Table IA.13 replaces it with indicators for each month of 2022, with indicators for the pricing windows that contain one of the four weeks of Bank of Israel rate decisions of Section IA.4.5, or with no control for 2022. The checks on contract age, the lead control, the weeks of rate decisions, and domestic holders in this section use indicators for each month of 2022.

Shifted calendars and later maturities. Table IA.14 replaces the calendar of week w with the calendar of week $w+k$, built by the same rule from contracts maturing in week $w+k$ and written at least 97 days before its start, for k from -26 to -5 and from 5 to 26 weeks, excluding $k = 14$. Shifts of four weeks or less overlap the pricing window or the tender week before maturity, and the calendar fourteen weeks ahead is close to a control. Every control of Table VII is kept. Of the 43 shifted calendars, 2 moves the three-month foreign funding rate with a t-statistic as large in absolute value as the actual calendar, 0 move the three-month Makam yield as much, and 0 move the six-month yield as much. Panel B adds the calendars of weeks $w+2$ to $w+4$ to each regression. Their joint Wald statistics have p-values between 0.202 and 0.837. The calendar of week $w+1$ is left out because foreign tender purchases come in the week before the hedges mature.

Table IA.13: Scheduled hedge maturities and the Makam yield: the control for 2022

This table reports the instrumented decline in the Makam yield per ILS billion of foreign acquisitions and the instrumented response of the Makam yield to the foreign funding rate, with the instrument, weeks, and the other controls of Section IA.4.5, under four controls for 2022. Pass-through is in basis points per 100 basis points. The pooled estimate uses one price impact for the three- and six-month yields. Anderson–Rubin 95% sets are in brackets, and F is the first-stage F for foreign acquisitions. Newey–West standard errors with 8 lags. Sources: Bank of Israel and LSEG.

	One indicator for 2022	Month indicators	Rate-decision windows	None
Price impact, three months	2.44	2.71	3.09	2.45
	[1.21, 4.21]	[0.07, 5.99]	[1.57, 5.11]	[1.15, 4.29]
first-stage F	15.5	7.2	9.6	15.5
Price impact, six months	3.16	2.67	2.95	3.17
	[1.90, 5.16]	[1.14, 8.19]	[1.63, 5.67]	[1.92, 5.13]
first-stage F	14.5	7.0	9.1	14.5
Price impact, pooled	2.80	2.69	3.02	2.81
	[1.81, 4.41]	[1.19, 6.43]	[1.84, 5.12]	[1.79, 4.45]
Pass-through, three months	21	18	23	22
Pass-through, six months	34	23	27	34

Foreign acquisitions and domestic displacement. Price impact in the model is the yield response per shekel of domestic holdings displaced, and Table VII divides by foreign acquisitions. The two coincide only if foreign acquisitions displace domestic holdings one for one. With A^F foreign acquisitions before redemptions, I issuance, and R^F and R^D foreign and domestic redemptions, all at a common price,

$$\Delta F = A^F - R^F, \qquad \Delta S = I - R^F - R^D,$$
$$X \equiv \Delta F - \Delta S = A^F - (I - R^D) = -\Delta D. \tag{IA.3}$$

Foreign redemptions remove holdings and outstanding supply together, so domestic displacement X equals foreign acquisitions minus net supply to domestic holders, $N = I - R^D$. On identical weeks and controls, the conversion $\eta = \pi_X/\pi_A$ is 0.95 at three months and 0.91 at six months, with confidence sets that include 1, and price impact per shekel of displacement is 2.86 and 2.94 basis points per ILS billion (Table IA.17, Panel A). The ratio measures $1/\delta$ at fixed autonomous domestic demand and equals $1/B$ under the fixed issuance of the estimated model. Acquisitions that the records of foreign transactions do not match are dated monthly. Over the 19 months June 2020–December 2021, their relation with scheduled maturities is 0.051 ILS billion per USD billion (HAC standard error 0.026), or 0.042

Table IA.14: Scheduled hedge maturities: shifted calendars and later maturities

This table reports four regressions on scheduled hedge maturities, the first stages for the three-week change in the three-month foreign funding rate and for foreign acquisitions, and the reduced forms for the fall in the three- and six-month Makam yields, each with the controls listed in Section IA.4.5. Panel A replaces the calendar of week w with the calendar of week $w+k$, $k \in \{-26,\dots,-5\} \cup \{5,\dots,26\}$, $k \neq 14$, built by the same rule. The randomization p-value is the share of shifted calendars whose t-statistic is at least as large in absolute value as the actual calendar's. Panel B adds the calendars of weeks $w+2$, $w+3$, and $w+4$ and reports the t-statistic on the calendar of week w and the joint Wald test on the three added calendars, $\chi^2(3)$. Newey–West standard errors with 8 lags. The sample is 114 weeks ending 11 June 2020 to 25 August 2022. Sources: Bank of Israel and LSEG.

	First stage		Reduced form, fall in yield	
	Δr^F, 3m	Foreign acquisitions	3m	6m
Panel A. Calendars shifted by k weeks				
t-statistic, actual calendar	−3.98	3.93	3.27	3.69
Shifted calendars with $\lvert t\rvert$ at least as large	2	0	0	0
of which with the same sign	1	0	0	0
Randomization p-value	0.047	0.000	0.000	0.000
95th percentile of $\lvert t\rvert$, shifted calendars	2.76	2.22	2.31	2.67
Shifted calendars	43	43	43	43
Panel B. Calendars of weeks $w+2$ to $w+4$ added				
t-statistic, calendar of week w	−4.08	3.93	3.35	3.65
Wald statistic, weeks $w+2$ to $w+4$	4.07	0.85	4.62	2.46
p-value	0.254	0.837	0.202	0.483

Table IA.15: Scheduled hedge maturities and the Makam yield, with the hedge stock and the funding gap

This table repeats Table VII of the paper with two further controls, the month-end hedge stock before week $w-2$ and TELBOR minus the foreign funding rate in week $w-3$. Weeks, instrument, outcomes, and the remaining controls are those of Table VII of the paper. Anderson–Rubin 95% sets are in brackets. Newey–West t-statistics with 8 lags in parentheses. Sources: Bank of Israel and LSEG. *, **, and *** denote significance at the 10, 5, and 1% levels, based on the t-statistics shown. Stars are omitted on instrumental-variable estimates whose first-stage F is below 10, for which the Anderson–Rubin set is the relevant inference.

Dependent variable	(1) Δr_w^F	(2) Δy_w	(3) Δy_w	(4) Foreign acquisitions	(5) Δy_w	(6) Δy_w
	First stage	OLS	IV	First stage	OLS	IV
Panel A. Three-month maturity						
Scheduled maturities (USD bn)	-8.5^{***}			0.85^{***}		
	(-4.2)			(3.7)		
Foreign funding rate (per 100 bp)		21^{***}	19^{**}			
		(5.7)	(2.2)			
Foreign acquisitions (ILS bn)					-1.98^{***}	-1.91^{**}
					(-6.7)	(-2.3)
First-stage F			18.0			13.9
Anderson–Rubin 95% set						$[-3.87, -0.03]$
Panel B. Six-month maturity						
Scheduled maturities (USD bn)	-6.9^{***}			0.84^{***}		
	(-3.7)			(3.7)		
Foreign funding rate (per 100 bp)		13^{***}	42^{***}			
		(3.5)	(4.5)			
Foreign acquisitions (ILS bn)					-1.46^{***}	-3.41^{***}
					(-6.1)	(-4.8)
First-stage F			13.5			13.6
Anderson–Rubin 95% set			[25, 70]			$[-5.54, -2.12]$
Hedge stock and TELBOR minus r^F	Yes	Yes	Yes	Yes	Yes	Yes
Change in TELBOR	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Weeks	114	114	114	114	114	114

(0.033) with a trend and a 2021 indicator, so the price ratios keep the recorded-acquisition denominator.

The spread outcome, direct effects, and the pricing horizon. With TELBOR minus the Makam yield as the outcome of column (6) of Table VII, the response is 2.49 basis points per ILS billion at six months and 2.74 at three months, close to the yield declines of 2.67 and 2.71 (Table IA.17, Panel B). A reader may suspect that heavy maturity weeks move the yield directly. Cancelling the reduced-form point estimate would take a direct effect of 1.58 basis points per USD billion of scheduled maturities at three months and 1.55 at six months (Panel C). Holding the acquisition window and instrument fixed, the six-month yield decline per ILS billion is 2.67 basis points over the pricing window, 2.04 four weeks later ($[0.53, 4.02]$), and 1.49 eight weeks later ($[-0.06, 5.60]$). The estimated model uses the slope over the acquisition window.

Price impact as a multiplier. van der Beck, Bretscher, and Fu (2025) express price impact as a multiplier M, the percentage change in price per demand shift of 1% of the amount outstanding, and bound M from below by $(\sigma_p/\sigma_q)\sqrt{1/\rho - 1}$, with σ_p the volatility of returns, $\sigma_q = \sqrt{\pi/2}$ times mean portfolio turnover, and ρ the agreement among investors. Converted to a price change with the bill's duration and scaled by Makam outstanding from January to September 2022 (ILS 128 billion), the six-month price impact of Table VII, Panel B, column (6), gives $M = 0.017$, an aggregate demand elasticity of about 59. With turnover from monthly absolute changes in sector shares and σ_p from monthly changes in the six-month yield, July 2020 to August 2022, the bound is 0.008 at $\rho = 0.5$ and 0.016 at $\rho = 0.2$, below the estimate.

IA.4.6 The year-end pause

Section IV of the paper argues that foreign buying pauses at year-end, when global banks shrink their balance sheets, and that the Makam yield rises during the pause. Figure IA.4 plots both around the first week ending on or after 11 December. To measure them, we regress each weekly outcome on indicators for weeks ending from the 11th through the last day of December and for the same weeks of March, June, and September, with the demeaned lagged foreign share and its interactions with the indicators. For the Makam yield,

$$\Delta y_w = \alpha + \beta_Y Y_w + \beta_Q Q_w + \big(\lambda + \pi_Y Y_w + \pi_Q Q_w\big) s_w + \theta_D \, \Delta r^D_w + \theta_F \, \Delta r^F_w + \varepsilon_w, \qquad \text{(IA.4)}$$

Table IA.16: Scheduled hedge maturities: contract age and the lead control (bp per ILS billion of foreign acquisitions)

This table reports the instrumented decline in the Makam yield per ILS billion of foreign acquisitions, the design of Table VII, column (6), of the paper, with the instrument or the lead control changed. The sample is the 114 weeks ending 11 June 2020–25 August 2022, with the controls of Table VII of the paper. Panel A restricts the instrument to contracts traded at least the stated number of days before the maturity week, each cutoff with its own lead. Panel B varies the lead, and its window-flow rows add issuance and redemptions over the acquisition window. The last column reports the first-stage F-statistic. Anderson–Rubin 95% sets beneath the estimates, from a HAC test with 8 Newey–West lags, with $\mathbb{R}$ the real line and $\cup$ a union of intervals. Sources: Bank of Israel and LSEG.

	Three-month yield	Six-month yield	F
Panel A. Minimum contract age (days)			
30	5.84	3.50	3.2
	$(-\infty, -22.26] \cup [2.36, \infty)$	$(-\infty, -31.29] \cup [1.30, \infty)$	
60	3.49	2.27	6.8
	$[0.90, 7.51]$	$[1.02, 8.27]$	
90	3.78	2.51	7.3
	$[1.71, 7.80]$	$[1.20, 8.03]$	
97 (baseline)	2.74	2.49	7.4
	$[0.09, 5.67]$	$[0.97, 7.04]$	
120	5.16	3.33	2.8
	$(-\infty, -10.22] \cup [1.86, \infty)$	$(-\infty, -14.67] \cup [1.11, \infty)$	
150	5.57	2.90	2.4
	$(-\infty, -6.65] \cup [1.33, \infty)$	$(-\infty, -7.53] \cup [1.03, \infty)$	
Panel B. The 14-week lead			
Before week $w-3$ (baseline)	2.71	2.67	
	$[0.07, 5.99]$	$[1.14, 8.19]$	
Before week $w-2$	2.58	2.60	
	$[-0.05, 5.61]$	$[1.13, 7.52]$	
Age cutoff only	2.54	2.62	
	$[-0.18, 5.70]$	$[1.10, 7.61]$	
No lead	2.40	2.46	
	$[-0.32, 5.35]$	$[1.08, 6.48]$	
Baseline, window flows	2.69	2.66	
	$[-0.50, 5.62]$	$[1.19, 7.13]$	
Age cutoff only, window flows	2.57	2.64	
	$[-0.63, 5.36]$	$[1.19, 6.83]$	

Table IA.17: Scheduled hedge maturities: displacement, the spread outcome, and direct effects

This table reports three checks on the design of Table VII of the paper. The sample is the 114 weeks ending 11 June 2020–25 August 2022, with the controls of Table VII of the paper unless the row says otherwise. Panel A estimates the responses in equation (IA.3) on identical weeks, and its last row divides the price response by domestic displacement. Panel B replaces the outcome of column (6) of Table VII with TELBOR minus the Makam yield and drops the TELBOR control. Panel C reports the direct yield effect that cancels the reduced-form point estimate and the smallest that admits zero to the 95% set. Standard errors in parentheses and Anderson–Rubin 95% sets in brackets, from a HAC test with 8 Newey–West lags. Sources: Bank of Israel and LSEG.

	Three-month yield	Six-month yield
Panel A. Responses to scheduled maturities (ILS bn per USD bn)		
Foreign acquisitions, π_A	0.583	0.579
	(0.217)	(0.219)
Net supply to domestic holders, π_N	0.030	0.052
	(0.130)	(0.138)
Domestic displacement, π_X	0.553	0.526
	(0.253)	(0.255)
Conversion, $\eta = \pi_X/\pi_A$	0.948	0.910
	[0.24, 1.53]	[0.12, 1.53]
Price per ILS bn of displacement (bp)	2.86	2.94
	[0.08, 13.73]	[1.33, 37.33]
Panel B. TELBOR minus the Makam yield (bp per ILS bn of foreign acquisitions)		
Controls of Table VII	2.74	2.49
	[0.09, 5.67]	[0.97, 7.04]
Controls of Table IA.15	1.16	3.64
	[−10.05, 4.50]	[1.32, 21.10]
Panel C. Direct yield effect of scheduled maturities (bp per USD bn)		
Cancels the point estimate	1.58	1.55
Admits zero to the set	0.022	0.552
Cancels the point estimate, adding levels	0.45	1.57
Admits zero to the set, adding levels	0.000	0.586

where Y_w and Q_w indicate the year-end and other quarter-end weeks. The purchase regressions omit the two rate changes. Foreign net purchases fall by ILS 2.4 billion over the three year-end weeks, against ILS 0.2 billion in the same weeks of other quarters, and the three-month yield rises by 8.6 basis points (Table IA.18). The year-end rise in the yield keeps t-statistics of 3.7 and 3.8 with 8 and 13 Newey–West lags, and a bootstrap that resamples whole calendar years gives $p = 0.003$.

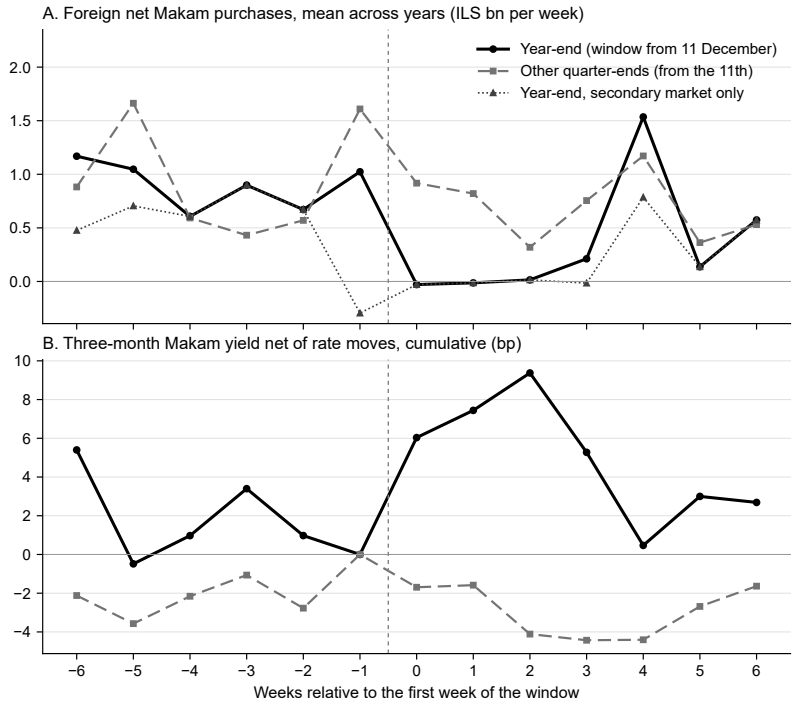


Figure IA.4: **Foreign purchases and Makam yields around year-end, 2017–2023.** This figure plots event time around the first week ending on or after 11 December (solid) and the same week of other quarter-ends (dashed). Panel A plots foreign net Makam purchases before redemptions in ILS billion, averaged over 2017–2021, and the dotted line counts secondary-market trades only. Panel B plots the cumulative change in the three-month Makam yield in basis points, net of the fitted effects of TELBOR and the foreign funding rate and zero in week −1, averaged over 7 year-ends. The records of foreign transactions end in August 2022. Sources: Bank of Israel and LSEG.

Table IA.18: The year-end pause in foreign buying

	Last three weeks of December	Same weeks of March, June, and September	Year-ends
Foreign net purchases (ILS bn)	−2.4	−0.2	2017–2021
	(−9.3)	(−0.4)	
secondary market only	−1.0	1.2	2017–2021
	(−4.0)	(1.8)	
Three-month Makam yield (bp)	8.6	−5.3	2017–2023
	(3.2)	(−1.6)	

Notes: Table IA.18 reports the change in foreign net purchases and in the three-month Makam yield over the weeks ending between December 11 and the end of December and the matching weeks of other quarter-ends. The weekly samples run from January 2017 to August 2022 for purchases and to September 2024 for the yield. Each entry is three times the coefficient on the window indicator in equation (IA.4), evaluated at the mean foreign share. t-statistics in parentheses, Newey–West with 4 lags. Sources: Bank of Israel and LSEG.

IA.5 Funding rates and the Makam yield

Section V of the paper states Proposition 1, and Section V.A sizes funding-rate exposure with an estimated model. This section proves the proposition, derives the responses that scheduled hedge maturities measure when the foreign funding rate itself responds to foreign demand, and describes the estimated model.

IA.5.1 Proof of Proposition 1

Proof. Write the foreign slopes as $a = na_0$ and $b = nb_0$, where n is the size of the foreign investor base, so that growth of the base is a rise in n. Equations (12) and (13) give

$$\frac{\partial y}{\partial r^F} = \frac{nb_0}{na_0 + B}, \qquad \left|\frac{\partial y}{\partial u}\right| = \frac{1}{na_0 + B}.$$

(i) Differentiating with respect to n,

$$\frac{\partial}{\partial n}\frac{nb_0}{na_0 + B} = \frac{b_0 B}{(na_0 + B)^2} > 0 \quad \text{for } B > 0, \qquad \frac{\partial}{\partial n}\frac{B}{na_0 + B} = -\frac{a_0 B}{(na_0 + B)^2} < 0.$$

(ii) Let $G = a_0 y - b_0 r^F > 0$, so that $F = nG + u$. Differentiating the market-clearing condition $nG + u + \bar{D} - \delta(r^D - y) = \bar{S} + \phi(r^D - y)$ with respect to n gives $\partial y/\partial n = -G/(na_0 + B) < 0$. Hence

$$\frac{\partial F}{\partial n} = G + na_0\frac{\partial y}{\partial n} = \frac{G\,B}{na_0 + B} > 0, \qquad \frac{\partial D}{\partial n} = \delta\,\frac{\partial y}{\partial n} \le 0,$$

where $D = \bar{D} - \delta(r^D - y)$ is domestic holdings. Since $S = F + D$,

$$\frac{\partial}{\partial n}\frac{F}{S} = \frac{1}{S^2}\left(D\,\frac{\partial F}{\partial n} - F\,\frac{\partial D}{\partial n}\right) > 0$$

for $F > 0$ and $D > 0$. Issuance enters only through ϕ in B, so the endogeneity of S does not affect the sign.

(iii) Differentiating with respect to n,

$$\frac{\partial}{\partial n}\frac{1}{na_0 + B} = -\frac{a_0}{(na_0 + B)^2} < 0.$$

Market clearing gives $F = S - D = \bar{S} - \bar{D} + B(r^D - y)$. With r^D, $\bar{S}$, $\bar{D}$, and the set of active domestic investors fixed, any change in u, n, b, or r^F gives $dF = -B\,dy$, so $-dy/dF = 1/B$, which does not contain n.

(iv) Both expressions above and $1/B$ are strictly decreasing in B, so a fall in B raises all

three. □

IA.5.2 The foreign funding rate as a price

Section V.A of the paper notes that foreign investors' forward purchases raise the cost of the swap, so the foreign funding rate responds to foreign demand as well as moving it. Here we derive what scheduled hedge maturities and least squares measure in that case. Let the funding rate respond to foreign holdings,

$$r^F = \bar{r}^F + \kappa F + v - \eta Z, \qquad \kappa, \eta \geq 0, \tag{IA.5}$$

where κ measures how much foreign holdings raise the cost of the swap, Z is the supply of forward dollars from domestic institutions' hedge renewals, and v collects other shocks to swap supply. Hold TELBOR, $\bar{S}$, $\bar{D}$, and the set of domestic investors with positive holdings fixed. Market clearing gives $F = \bar{S} - \bar{D} + B(r^D - y)$, so every shock satisfies $dF = -B\,dy$.

A shift in foreign demand. Let $L = a + B + \kappa B b$. A rise in u lowers the Makam yield by

$$-\frac{dy}{du} = \frac{1}{L}.$$

Proposition 1 holds the foreign funding rate fixed ($\kappa = 0$). With $\kappa > 0$, the rise in foreign holdings raises the funding rate, which offsets part of the fall in the yield. Price impact per additional foreign holding remains $-dy/dF = 1/B$, because $dF = -B\,dy$ whatever moves foreign demand.

Two instrumental-variable ratios. A rise in swap supply Z gives

$$\frac{dy}{dZ} = -\frac{\eta b}{L}, \qquad \frac{dr^F}{dZ} = -\frac{\eta(a+B)}{L}, \qquad \frac{dF}{dZ} = \frac{B\eta b}{L},$$

so

$$\frac{dy/dZ}{dr^F/dZ} = \frac{b}{a+B}, \qquad \frac{dy/dZ}{dF/dZ} = -\frac{1}{B}.$$

The first ratio is funding-rate exposure, equation (12), and the second is price impact, equation (14). Scheduled hedge maturities shift swap supply in this way, and Table VII of the paper estimates the first ratio in column (3) and the second in column (6). Neither ratio requires κ or η. If Z also shifts foreign demand directly, $u = \psi Z$ with $\psi \neq 0$, then $dy/dZ = -(\eta b + \psi)/L$ and $dr^F/dZ = \Big(\kappa B\psi - \eta(a+B)\Big)/L$, and the first ratio no longer equals funding-rate exposure. The second still equals $-1/B$, because $dF = -B\,dy$ holds for

every shock.

Least squares. Suppose the funding rate moves with independent foreign-demand shocks u, with variance σ_u^2, and swap-supply shocks v, with variance σ_v^2. The responses to v are $dy/dv = b/L$ and $dr^F/dv = (a+B)/L$, and the responses to u are $dy/du = -1/L$ and $dr^F/du = \kappa B/L$. The least-squares coefficient of the change in the Makam yield on the change in the funding rate is then

$$\beta_{OLS} = (1-\omega)\,\frac{b}{a+B} - \frac{\omega}{\kappa B}, \qquad \omega = \frac{\kappa^2 B^2 \sigma_u^2}{\kappa^2 B^2 \sigma_u^2 + (a+B)^2 \sigma_v^2},$$

where ω is the share of the variance of the funding rate that comes from foreign-demand shocks. With independent shocks and nonnegative feedback, least squares understates funding-rate exposure whenever foreign-demand shocks move the funding rate, and it is zero or negative for large ω. The bias in the ownership slope is downward if the standard deviation of foreign-demand shocks grows in proportion to the foreign investor base.

Domestic-clearing shocks. Autonomous domestic clearing can move as well. Subtract conditional means and hold TELBOR fixed, so that

$$F - ay + br^F = u, \qquad F + By = \varepsilon, \qquad r^F - \kappa F = v,$$

where ε is a net domestic-supply innovation, which falls when domestic demand rises. With $A = a + B$ and $L = A + \kappa bB$, equilibrium gives

$$y = \frac{-u + (1+\kappa b)\varepsilon + bv}{L}, \qquad r^F = \frac{\kappa B u + \kappa a \varepsilon + Av}{L}.$$

Funding-rate exposure is $E = b/A$. Let $V_f = \operatorname{Var}(\kappa B u + \kappa a \varepsilon + Av) > 0$. The conditional least-squares slope satisfies

$$\beta_{OLS} - E = \frac{L}{AV_f}\Big[\kappa a \operatorname{Var}(\varepsilon) - \kappa B \operatorname{Var}(u) + \kappa(B-a)\operatorname{Cov}(u,\varepsilon) + A\{\operatorname{Cov}(\varepsilon,v) - \operatorname{Cov}(u,v)\}\Big].$$

With zero feedback and positive $\operatorname{Var}(v)$, least squares equals exposure exactly when $\operatorname{Cov}(\varepsilon, v) = \operatorname{Cov}(u, v)$. With independent innovations and positive feedback, the bias has the sign of $a\operatorname{Var}(\varepsilon) - B\operatorname{Var}(u)$. Domestic-clearing and foreign-demand shocks push the bias in opposite directions, which is why Section V.A of the paper estimates exposure with a model instead of reading it from co-movement.

IA.5.3 The estimated model

Section V.A of the paper uses the price impact from scheduled hedge maturities to estimate funding-rate exposure at low and high foreign ownership. This subsection gives the full specification, reports exposure and model-implied co-movement for every fit, and compares changing with constant exposure. The reference specification sets feedback from foreign holdings to the foreign funding rate to zero, and the alternative allows nonnegative feedback.

Data and coupon predictors. The monthly sample has 89 observations, January 2017–May 2024. Foreign holdings F are Bank of Israel holdings at market value in ILS billion at month-end. The Makam yield y and the foreign funding rate r^F are three-month annual simple rates in basis points on a common quote date within seven calendar days of month-end. The yield is converted from the published gross yield Y in percent as

$$y = 10^4 \frac{365}{91} \left[(1 + Y/100)^{91/365} - 1 \right],$$

and the funding rate is built from same-date spot and forward quotes and the 26.161-basis-point dollar-funding adjustment. The state s is the previous month's foreign share, standardized with the 2017 to 2018 baseline, and affine slopes use $z = (s - s_c)/h$ with $(s_c, h) = (3.9629, 5.0306)$. We evaluate the model at foreign shares of 5.9% (L) and 26.4% (H). The common controls C are an intercept, a calendar-year trend, eleven month indicators, lagged ownership, holdings, funding, and yield, and current three-month TELBOR and one-, two-, and three-year swap rates, 21 columns in all, and the conditional responses hold TELBOR and the swap rates fixed.

The excluded predictors are $R = (Z, sZ)'$, where Z is scheduled annual coupon cash on a fixed cohort of twelve nominal government bonds issued before 2017 and held by domestic mutual funds. Each month uses the latest full holdings snapshot dated no later than the end of month $t - 2$ and at most 45 days old. The earlier extended and the exit-period fund portfolios supply 38 and 51 months, with eight overlapping months as a check. The cohort generates 53 scheduled bond-year coupons, excluding principal, final coupons, initial stubs, and indexed payments. The model lets R shift domestic clearing and funding means and excludes R from foreign demand, conditional on C, so domestic coupon cash must not stand in for a shift in foreign demand. After conditioning on C, the two coupon columns keep rank two and 23 and 58% of their centered variation.

The system and its innovations. The foreign slopes a and b and the domestic supply slope B are those of the paper's model, each a function of the state s. At fixed predictors

the system is

$$F - a(s)y + b(s)r^F = C\gamma_u + u, \tag{IA.6}$$

$$F + B(s)(y - r^D) = C\gamma_d + R\pi_d + \varepsilon, \tag{IA.7}$$

$$r^F - \kappa(s)F = C\gamma_v + R\pi_v + v. \tag{IA.8}$$

The clearing equation follows from $F = \bar{S} - \bar{D} + B(r^D - y)$, with $C\gamma_d + R\pi_d$ the conditional autonomous net supply, and each slope is affine in z. Because TELBOR is in C, the $B_0 r^D$ term is absorbed into the clearing mean, while the $B_1 z r^D$ term stays tied to B_1. Tying the ownership–TELBOR coefficient to the domestic supply slope $B(s)$ is the conditional-mean restriction of the paper. The three means have 67 coefficients.

For finite B_H, the normalized clearing innovation is $\varepsilon/B_H = e + \xi v$, with $(u, e) \perp v$ and the loading ξ estimated. Under Student-t shocks, (u, e) is bivariate Student-t with five degrees of freedom and covariance Σ_D, and v is Student-t with eight degrees of freedom and variance V_v. The normal specification uses the same means and covariance blocks. Put $\rho = 1/B_H$ and $t(s) = B(s)/B_H$, with $t_H = 1$. After subtracting conditional means, the matrix that maps $(F, y, r^F)'$ into $(u, e, v)'$ has rows

$$(1, -a, b), \quad (\rho + \xi\kappa, t, -\xi), \quad (-\kappa, 0, 1),$$

and determinant $J = t + \rho a + bt\kappa$. The linked TELBOR term in the normalized clearing mean is $(B_1/B_H) z r^D$. At $\rho = 0$, which evaluates zero price impact, $t(s) = (1+\eta z)/(1+\eta z_H)$, and the linked term is $\eta z r^D/(1 + \eta z_H)$. For a centered d-dimensional Student-t innovation with covariance Σ, the density is

$$f_{\nu,d}(e; \Sigma) = \frac{\Gamma((\nu + d)/2)|\Sigma|^{-1/2}}{\Gamma(\nu/2)[\pi(\nu - 2)]^{d/2}} \left(1 + \frac{e'\Sigma^{-1}e}{\nu - 2}\right)^{-(\nu+d)/2}.$$

The likelihood sums $\log J + \log f_{5,2}(u, e; \Sigma_D) + \log f_{8,1}(v; V_v)$ across months, with normal densities in the normal specification, and each trial refits all 67 means and four covariance coefficients. We impose $a, b \geq 0$, $B > 0$, $a + B > 0$, and $J > 0$ over the observed state range, with the own-yield restriction on market-value demand. The reference specification fixes $\kappa(s) = 0$, and the feedback specification imposes $\kappa(s) \geq 0$ over the same range. The tables report the best converged admissible fits with coefficient bounds of 64, and innovations are independent across months, with six-lag Ljung–Box p-values from 0.18 to 0.95 at the reference estimate.

Price impact, exposure, and co-movement. The estimated model imposes the price impact from scheduled hedge maturities at high ownership, at the three-month point estimate of 2.80 basis points per ILS billion and at both ends of its 95% Anderson–Rubin set, [1.81, 4.41], with zero price impact as a benchmark. In the monthly system

$$B_{\text{monthly}} = \frac{\eta_c}{h_c \theta_{\text{calendar}}} + V + \phi, \qquad h_c = \eta_c = 1, \quad V = \phi = 0,$$

so a shekel of acquisitions displaces a shekel of domestic holdings (Section IA.4.5), the three-week response applies at the monthly horizon, and valuation and issuance stay fixed. Holding foreign-demand and domestic-clearing innovations fixed, funding-rate exposure per 100 basis points of the funding rate is

$$E(s) = 100 \frac{b(s)}{a(s) + B(s)} = 100 \frac{\rho b(s)}{t(s) + \rho a(s)}. \tag{IA.9}$$

Model-implied co-movement also includes the domestic component correlated with funding. With

$$h_y = J^{-1}\Big(-\rho, 1 + b\kappa, \rho b + \xi(1 + b\kappa)\Big), \qquad h_f = J^{-1}\Big(\kappa t, \kappa a, t + \rho a + a\kappa\xi\Big),$$

co-movement is the covariance ratio

$$\beta(s) = 100 \frac{h_y \Sigma_* h_f'}{h_f \Sigma_* h_f'}, \qquad \Sigma_* = \text{diag}(\Sigma_D, V_v), \tag{IA.10}$$

conditional on C, R, and s. With zero feedback, $\beta(s) = 100(\rho b + \xi)/(t + \rho a)$, so co-movement can be positive when exposure is zero. At the point estimate of price impact, the zero-feedback model gives exposure of 3.2 basis points at low ownership and 14.1 at high ownership with Student-t shocks, and 3.4 and 13.4 with normal shocks (Table IA.20, Panel A). A 100-basis-point fall in the foreign funding rate therefore lowered the Makam yield by about 11 basis points more at high ownership than at low ownership. In observed projections on the same months, co-movement rises by 4.6 basis points across the two ownership states in levels and by 23.6 in monthly changes. The decomposition of Table VIII of the paper writes $E(a, b, B) = 100b/(a + B)$. Switching the foreign slopes first contributes $E(a_H, b_H, B_L) - E_L$, switching them after the domestic supply slope contributes $E_H - E(a_L, b_L, B_H)$, and the domestic contribution is the rest of the total rise.

Feedback and the price-impact restriction. With nonnegative feedback from foreign holdings to the funding rate and Student-t shocks, exposure at the point estimate of price

impact is 9.7 and 23.0 basis points (Panel B), and the likelihood-ratio statistic against zero feedback is 7.0. Under normal shocks the data do not identify the feedback. At the point estimate of price impact and at the upper end of its set, the best normal fit puts the feedback coefficient at the bound of the search, about 800 funding basis points per ILS billion at high ownership, and the likelihood-ratio statistics against zero feedback are only 3.6 and 1.4. The normal-shock rows of Panel B therefore report corners of the search. Both zero-impact fits also reach the bound. Without the restriction from scheduled hedge maturities and with independent funding and clearing innovations, the zero-feedback model estimates high-state price impact at 2.67 basis points per ILS billion with Student-t shocks, close to the hedge-maturity estimate of 2.80, and at 7.88 with normal shocks. With nonnegative feedback the two estimates are 1.62 and 7.34.

Table IA.19: The funding component of TELBOR minus the Makam yield at each price impact

This table repeats the calculation of the funding component in Section V.A of the paper at each price impact at which the zero-feedback model is estimated. The funding term is the first term of equation (11) of the paper, averaged over January–September 2022. Interest is the additional interest the Bank of Israel would have paid on Makam in 2022 had exposure stayed at its 2017–18 level, and negative weeks count the weeks of July 2020–December 2021, out of 79, with a negative three-month yield at that exposure. At the point estimate with Student-t shocks, the funding term is 34 basis points. Zero price impact implies zero exposure. Sources: Bank of Israel and LSEG.

	Student-t shocks			Normal shocks		
Price impact (bp per ILS bn)	Funding term (bp)	Interest (ILS bn)	Negative weeks	Funding term (bp)	Interest (ILS bn)	Negative weeks
0	0	0	25	0	0	25
1.81	27	0.5	14	13	0.2	17
2.80	34	0.6	11	21	0.3	12
4.41	44	0.7	9	31	0.5	8

Price impact and the likelihood. We refit the zero-feedback model with Student-t shocks at price impacts from 0.05 to the upper end of the 97.5% Anderson–Rubin set, in steps of 0.25, and in steps of 0.02 near the maximum of the likelihood and near the critical values. The likelihood is highest at 3.58 basis points per ILS billion, inside the 95% Anderson–Rubin set of the price impact pooled across the three- and six-month yields, [1.81, 4.41] (Section IA.4.5). Over that set the January–September 2022 funding term runs from 27 to 44 basis points, and over the 90% set, [1.97, 4.03], from 28 to 42.

Constant exposure as a competing explanation. Observed co-movement can rise because exposure rises or because the composition of shocks changes. Constant exposure imposes

$$b_0 = e_0(a_0 + B_0), \qquad b_1 = e_0(a_1 + B_1), \qquad e_0 \geq 0.$$

With affine slopes and $a(s)+B(s) > 0$, the restriction makes $b(s)/[a(s)+B(s)] = e_0$ constant over the ownership range, one net restriction that includes zero exposure at $e_0 = 0$. With feedback fixed at zero and the same sample, price impact, means, covariance laws, and bounds, changing exposure raises the best-found log likelihood by 6.68 points with Student-t shocks and 3.90 with normal shocks at the point estimate of price impact (Panel C). With nonnegative feedback, the gains are 4.37 and 0.00. Along the admissible grid of mixtures of the clearing innovation into foreign demand, the foreign-demand slopes account for 60–100% of the rise in exposure with Student-t shocks and 92–98% with normal shocks.

Table IA.20: Funding-rate exposure and co-movement in the estimated model (bp per 100 bp of the foreign funding rate)

This table reports funding-rate exposure and model-implied co-movement for each fit of the estimated model, and the fit of changing against constant exposure. The sample is 89 months, January 2017–May 2024. Each row imposes the stated high-state price impact, zero, the hedge-maturity point estimate, or the upper end of its set. Exposure is equation (IA.9) and co-movement equation (IA.10), at the low (L) and high (H) foreign shares. Relative log likelihood is measured from the point-estimate fit within each shock law and feedback specification, and superscript b marks a fit at a coefficient bound. Sources: Bank of Israel, Praedicta, and LSEG.

Price impact		Exposure		Co-movement		Relative
(bp per ILS bn)	Shocks	L (5.9%)	H (26.4%)	L	H	log likelihood
Panel A. Feedback fixed at zero						
0	Student-t	0.0	0.0	7.4	11.2	−2.74
2.80	Student-t	3.2	14.1	2.2	12.8	0.00
4.41	Student-t	6.9	20.2	1.3	12.7	0.02
0	Normal	0.0	0.0	4.9	5.2	−3.78
2.80	Normal	3.4	13.4	−1.5	8.7	0.00
4.41	Normal	4.7	20.6	−6.1	11.0	3.48
Panel B. Nonnegative feedback						
0	Student-t	0.0	0.0	3.5	5.8	-0.58^{b}
2.80	Student-t	9.7	23.0	0.3	10.3	0.00
4.41	Student-t	14.7	32.1	−1.2	10.1	0.84
0	Normal	0.0	0.0	2.3	4.2	-3.95^{b}
2.80	Normal	88.6	89.2	5.5	6.3	0.00^{b}
4.41	Normal	145.8	140.7	7.0	8.3	2.37^{b}

Panel C. Log likelihood with constant and changing exposure

		Constant	Changing	Gain
Feedback fixed at zero				
2.80	Student-t	−413.387	−406.711	6.677
4.41	Student-t	−412.978	−406.691	6.287
2.80	Normal	−481.250	−477.352	3.898
4.41	Normal	−481.011	−473.868	7.142
Nonnegative feedback				
2.80	Student-t	−407.582	−403.216	4.366
4.41	Student-t	−407.957	−402.372	5.585
2.80	Normal	−475.548	−475.546	0.002
4.41	Normal	−473.240	−473.174	0.066

IA.6 Evidence beyond Israel

Section VI of the paper estimates regression (3) on three-month bills in Mexico and Japan. This section describes the data for each market and asks whether the estimates survive other samples, trimming, and measurement choices. In each market the foreign funding rate is the three-month local-currency rate implied by covered interest parity, from LSEG spot rates, three-month forward points, and the three-month dollar overnight-index-swap rate plus the fixed spread of 26.161 basis points (footnote 7 of the paper), and each rate change is interacted with the demeaned lagged foreign share of bills outstanding. Weekly changes are taken over consecutive weeks.

Israel and Mexico. For Israel, the bill yield is the Bank of Israel three-month Makam curve, the domestic benchmark is three-month TELBOR, and the foreign share is Bank of Israel nonresident holdings of Makam over Makam outstanding at market value, at the end of the previous month, from Jan 2010to Sep 2024. For Mexico, the bill yield is the LSEG three-month Cetes yield, the domestic benchmark is the 91-day TIIE, and the foreign share is Banco de México nonresident holdings of Cetes over Cetes outstanding at nominal value (tables CA175 and CA145), at the end of the previous month, from Jan 2008to Dec 2023. The Mexican sample ends before the 2024 change in how the TIIE is computed.

Japan. The bill yield is the three-month Treasury discount bill yield at the average auction price of the Ministry of Finance, averaged over each week's auctions, and the domestic benchmark is the three-month yen overnight-index-swap rate. The foreign share is overseas holdings of Treasury discount bills over all Treasury discount bills in the Bank of Japan flow of funds (Bank of Japan (2026)), at the end of the previous quarter. The auction-to-auction variant measures each change from one weekly auction to the next, with the domestic benchmark and the foreign funding rate at the close before each auction.

Variants. In Mexico, the estimate of Table IX implies 2.9 basis points of additional pass-through per 10 percentage points of foreign ownership, and Table IA.21 shows it between 1.6 and 3.3 when one year is dropped at a time and between 1.8 and 3.0 across the longer, shortened, and trimmed samples. In Japan, measuring changes from auction to auction gives 2.0 ($t = 5.0$), against 2.3 in the weekly regression.

Table IA.21: Other bill markets: change in foreign-rate pass-through per 10 percentage points of foreign ownership (bp per 100 bp)

This table reports the ownership regression of Table IX of the paper for Mexico and Japan with one element changed in each row. Samples are weekly three-month bills, as described in Section IA.6. Trimmed rows drop the weeks with the largest 1% of absolute weekly changes, and the Mexican one-month row uses the one-month TIIE and one-month rates. t-statistics are Newey–West with 4 lags. Sources: Banco de México, Bank of Japan, Japanese Ministry of Finance, and LSEG. *, **, and *** denote significance at the 10, 5, and 1% levels, based on the t-statistics shown.

	Estimate	t	Weeks
Panel A. Mexico			
Table IX, Jan 2008–Dec 2023	2.9^{***}	3.2	824
Sample from 2005	2.4^{***}	2.7	970
Excluding March–June 2020	3.0^{***}	3.4	807
Excluding September 2008–June 2009	2.2^{**}	2.2	
Foreign-rate changes winsorized at 1% and 99%	2.0^{**}	2.1	
Without the largest 1% of foreign-rate changes	2.5^{***}	2.8	
Without the largest 1% of yield changes	2.4^{***}	2.8	
Without both	1.8^{**}	2.1	
Dropping one year at a time, smallest	1.6	1.6	
Dropping one year at a time, largest	3.3^{***}	3.5	
One-month yield	−0.6	−1.0	824
Panel B. Japan			
Table IX, weekly, 2010–2024	2.3^{***}	3.0	711
Auction to auction	2.0^{***}	5.0	

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