

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

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Discussion:

- **Summarizing (50 page paper, 38 page Appendix)**
- **Exposition**
- **Comments & Concerns**

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The paper in one slide

- **Motivation:** Surges of foreign capital inflows associated with increases in the spread between TELBOR (overnight interbank rate) and the yield on 3-month MAKAM (government bill)
  - TELBOR – MAKAM varies with foreign share (Figure 1), for example rose from ≈0 bp (2013–17, foreign share ≤ 6%) Sec. 2.4 to 51 bp (Jan–Sep 2022, foreign share 46%) Table 1
- **Claim:** part of this positive "convenience yield" on MAKAM is the cost at which foreign holders fund their MAKAM holdings r^F, borrowing in US dollars and hedging the Israel shekels (ILS) through FX swaps
- **Empirical evidence**
  - Co-movement: pass-through of the foreign funding rate r^F rises 7.4 bp per 10 pp of foreign share (−1 bp at 9%, 26 bp at 46%) eq. 3; Table 3, col. 1; also in 2010–12, and evidence in Mexico and Japan Table 3, col. 5; Table 9
  - 2011, CB ended nonresident tax exemption on MAKAM; MAKAM yield rises 12.8 bp vs. exempt bonds eq. 4; Table 4, col. 1
  - IV: scheduled rollovers of domestic institutions' dollar hedges instrument for r^F , a 100 bp fall in r^F lowers MAKAM by 18 bp; for foreign acquisitions, per ILS bn, price impact is 2.71 eq. 6; Table 7, Panel A, cols. 3 and 6
- **Estimated demand system:** the foreign investor funding term accounts for 21–34 of the 51 bp eqs. 10–11; Sec. 6.1; Table IA.14

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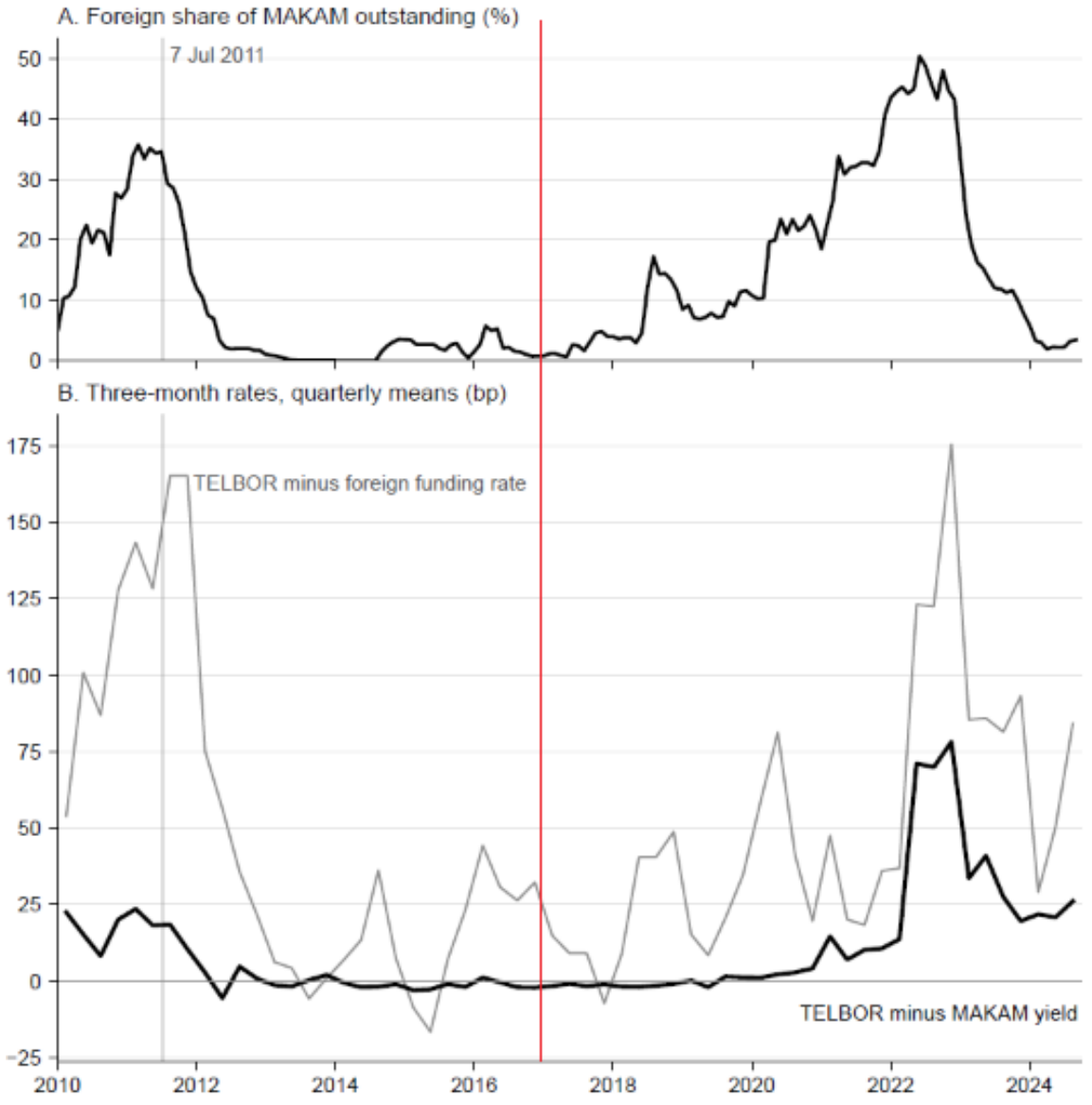
Where this paper contributes

- **Both parts of the trade are observed.** Foreign MAKAM purchases are matched to the same institutions' forward dollar purchases, for a later sample period (June 2020-Aug 2022?): about 0.8 shekel of forwards per shekel of bills Sec. 2.2; Figure 2; eq. IA.1
- **A reframing of convenience yields.** The spread between a "safe" bill and money-market rate contains the marginal holder's funding cost (Krishnamurthy & Vissing-Jorgensen; Nagel; Du, Im & Schreger)
- **Policy relevant.** The central bank's capacity to affect domestic interest rates, Secs. 2.4, 8.2; Figure 3: local-currency borrowing does not insulate the issuer from the global financial cycle, demand system model delineates the factors affecting local yields.
- **External validity, relevant for other countries.** In Mexico the foreign share of Cetes went from 4% to 59% and back; the paper shows foreign funding rate pass-through rises 2.9 bp per 10 pp of foreign ownership in Mexico Sec. 7.1; Table 9

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Foreign facts

- **Figure 1 in the paper:**
  - **Two surges and withdrawals of foreign investors, two spikes in spreads**
  - **Foreign share of MAKAM (gov't bills), black line top**
  - **Observed TELBOR – foreign funding rate, grey line bottom**
  - **Foreign funding rate defined by $1 + r^F = \frac{Q}{E}(1 + r^{\$})$, the USD borrowing rate (OIS + ISDA set 26.161 bp fix) hedged with FX swap Q**
  - **Observed TELBOR – MAKAM yield, black line bottom**



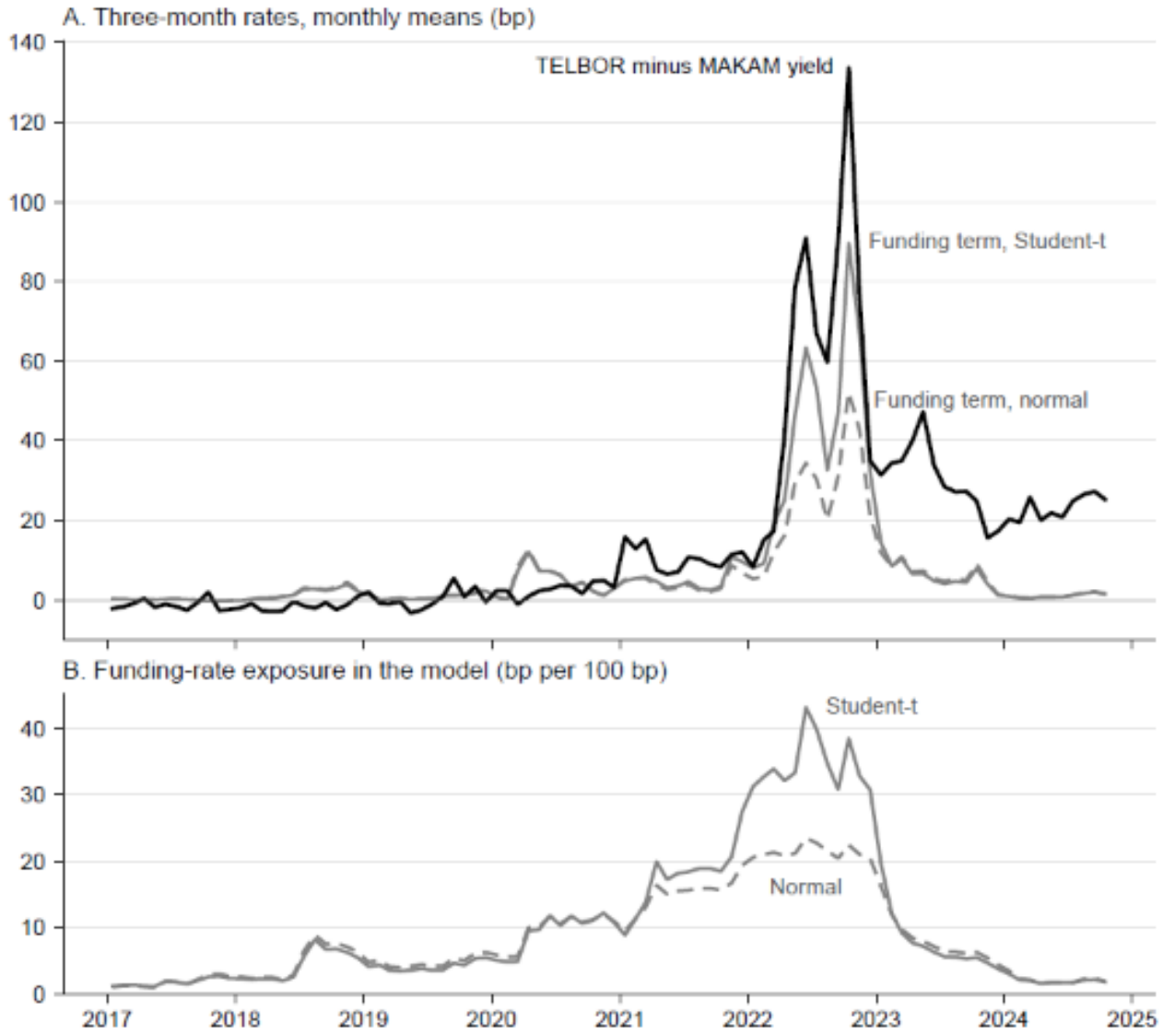
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Foreign effects

- **Figure 6 in the paper:**
  - **Observed TELBOR – MAKAM yield ("convenience yield")**
  - **Model implied contribution related to the foreign funding rate r^F defined as "the funding term" at lagged foreign share (λ)**

$$\frac{\lambda b_f}{\lambda b_y + B}(r^D - r^F)$$

  - **"Funding-rate exposure" is the weight on the spread between the TELBOR and foreign funding rate**



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Model: the demand system includes domestic and foreign…

- "Demand" = foreign holdings (eq7) : $F = \lambda\left(\bar{f} + b_y\, y - b_f\, r^F\right) + u, \qquad \lambda, b_y, b_f > 0.$
- "Supply" = S - D
  - Domestic holdings (eq8), no securities lending in Israel, so cannot be negative: $D_j = \max\{0,\ \bar{D}_j - \delta_j c\}, \qquad \delta_j \geq 0.$
  - Central bank issuance (eq9): $S = \bar{S} + \phi\, c, \qquad \phi \geq 0.$

- Market clearing: $\lambda\left(\bar{f} + b_y\, y - b_f\, r^F\right) + \boxed{u} = \bar{S} + \phi\left(r^D - y\right) - \bar{D} + \delta\left(r^D - y\right)$

which gives the supply slope $B = \phi + \delta$, a combination of the CB and domestic holders responses to the spread between TELBOR and the MAKAM yield.

- Re-arranging and combining terms into K, we have (eq11) for that spread (Figure 6):

$$\left(r^D - y\right) = \frac{\lambda b_f}{\lambda b_y + B}\left(r^D - r^F\right) + \frac{\lambda(b_y - b_f)}{\lambda b_y + B} r^D - \frac{\boxed{K}}{\lambda b_y + B}$$

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…with a mechanism of two alternatives to MAKAM (gov't bills),

- And the MAKAM yield, eq10: $$y = \frac{Br^D + \lambda b_F r^F + K}{\lambda b_y + B}$$
- There are two clientele for MAKAM and each clientele values MAKAM against its own outside option
- The MAKAM yield is thus a weighted mix of the two rates:
  - TELBOR (r_D) and the synthetic funding rate (r_F); each weight is holdings responsiveness to that rate (and we have sort of two price elasticities of foreign demand)



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…and defines “funding rate exposure” and price impact

(eq 11) $$\left(r^D - y\right) = \frac{\lambda b_f}{\lambda b_y + B}\left(r^D - r^F\right) + \frac{\lambda(b_y - b_f)}{\lambda b_y + B} r^D - \frac{K}{\lambda b_y + B}$$

- Where K = $\bar{S} - \bar{D} - \lambda \bar{f} - u$
  - = exogenous CB issuance – domestic demand when $\left(r^D = y\right)$
  - – foreign demand unaffected by $\left(r^F\right)$ or (y)
  - -- additive shift in foreign demand

Two affects on the MAKAM yield →

- **“foreign funding rate exposure”** (eq12) $$\frac{\partial y}{\partial r^F} = \frac{\lambda b_f}{\lambda b_y + B}$$
- **price impact** from change in desired foreign holdings u (eq13) $$\frac{\partial y}{\partial u} = -\frac{1}{\lambda b_y + B}$$

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Can we use to think about policies to counter global financial spillovers from an inflow surge:

- All three effects on the MAKAM yield y have B in the denominator, and would be reduced if B is larger
  - B is a mix of the two factors:
  - δ domestic holder sales related to TELBOR – MAKAM spread (Macro-Pru buffers for future sales),
  - ϕ Central Bank issuance related to TELBOR – MAKAM spread (expand issuance faster)
- To reduce foreign **funding rate exposure** and **price impact**, could also target $\lambda\ b_y$ (taxes?)
- In 2011 episode, targeted r^F directly via the FX swap piece and the spot rate
  - Cap controls/Macro-Pru Reserve Requirements on FX derivatives
  - Mandatory reporting for foreign and Israeli institutions of FX derivatives contracts, compliance costs
  - FX spot market interventions

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Comment 1: Explaining “convenience”

Period	Foreign share	TELBOR (r^D) – y
2018–19	9%	−1 bp
Jul 2020–Dec 2021	28%	8 bp
Jan–Sep 2022	**46%**	**51 bp**
Oct–Dec 2022	45%	81 bp
2023	15%	30 bp
Jan–Sep 2024	3%	24 bp

Source: paper, Table 1 (three-month rates), observed data

$$(r^D - y) = \frac{\lambda b_f}{\lambda b_y + B}(r^D - r^F) + \frac{\lambda(b_y - b_f)}{\lambda b_y + B} r^D - \frac{K}{\lambda b_y + B}$$

- Foreign funding term = exposure × $\left(r^D - r^F\right)$ eqs. 11–12, so its level depends on the level of r^F
  - r^F includes a fixed +26.161 bp (ISDA LIBOR fallback) spread Table 1 notes; fn. 5; without it the 95 bp gap Table 1 is ≈121 bp discussant’s calc. The ownership gradient is unchanged Table IA.6, Panel D; the level is not. Which dollar rate do the marginal arbitrageurs actually pay?
- $b_y \neq b_F$ (5.7 vs. 8.6) eq. 5; Table 5: the middle term $\lambda(b_y - b_F)\cdot$TELBOR eq. 11 is not zero and grows with domestic rates. Where is it in the 51 bp?
- 24–30 bp remains after foreigners leave Table 1, close to the 17–30 bp residual 51 bps − (21–34) but funds and pension funds also lack BoI deposit access: is the residual convenience, or another benchmark mismatch?
- Contrast to 2018-19, my reading: “local convenience” from a domestic institutional base (Bush & Solís, 2026; slide 13) for the later period in Israel

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Comment 2: Headline imprecision, and no foreign effect u?

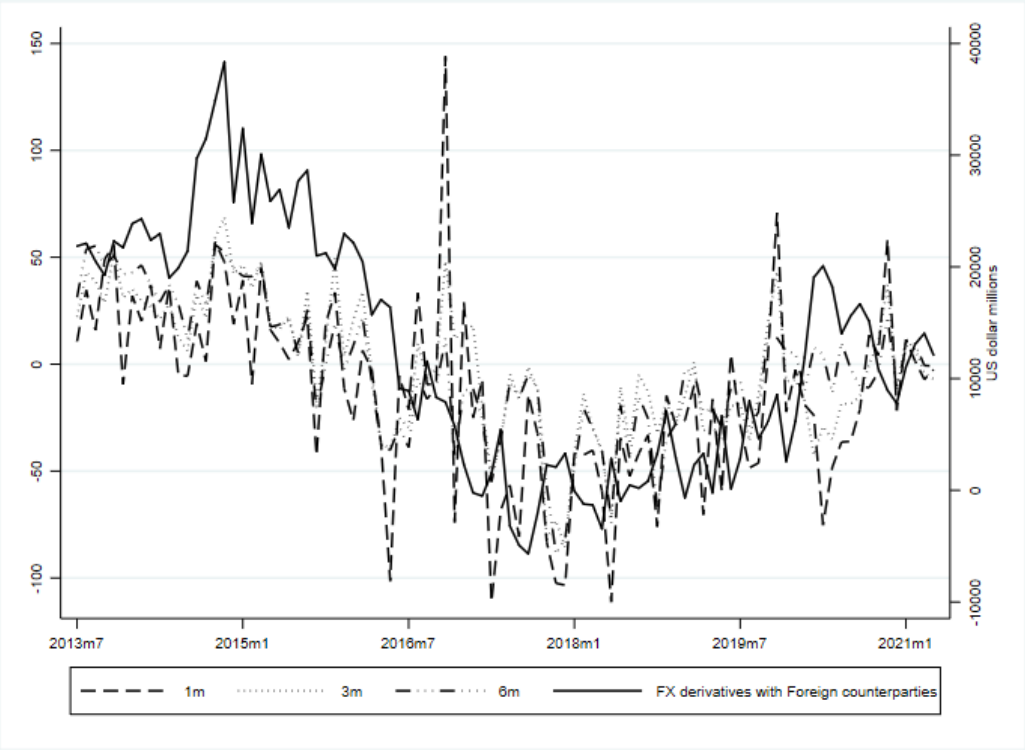
Price impact (bp per ILS bn)	Funding term, Student-t	Funding term, normal
0	0 bp	0 bp
2.71 (point estimate)	**34 bp**	**21 bp**
5.99 (upper end of AR set)	52 bp	38 bp

Anderson–Rubin 95% set: [0.07, 5.99]. Source: Internet Appendix Table IA.14

- The reported "21–34 bp" spans only the shock distribution Table 8; Sec. 6.1
- Price-impact alone spans a foreign funding term of roughly **0 to 52 bp** Table 7, col. 6; fn. 18; Table IA.14
- With the domestic hedge stock and TELBOR - r^F as controls (Table IA.10):
  - 3-month first stage F falls from 14.6 Table 7 to 10.1; IV pass-through 12 bp (t = 0.6) Table IA.10, Panel A
  - Price-impact AR set [−4.8, 12.0] includes zero
  - The 6-month estimates survive Table IA.10, Panel B
- **Suggestion:** carry the AR set into a band on the headline, or focus on the 6-month or a pooled estimate
- Also, the headline number has effect from foreign purchases to r^F set to zero; Mexican evidence it is not zero (next slide) Table 8 notes; eq. IA.5

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Mexican evidence: hedging flows move the funding rate



Foreign counterparties' FX derivatives with Mexican banks (USD mn, solid) vs. 1-, 3- and 6-month peso–dollar bases (bp). Source: Bush (2023), "Global banks and the impact on covered interest parity: an Emerging Market perspective," Figure 4.

- Bush (2023): Mexico, Jul 2013–Apr 2021, FX-derivatives data by counterparty
- **Domestic side:** resident banks' dollar hedging moves the 3-month USD-currency basis ≈13 bp per SD (USD 2.7 bn)
- **Foreign side:** foreign hedging of Cetes moves it ≈14 bp per SD (USD 10.7 bn), in the opposite direction, ie in BBN terminology:

  → foreign purchases do push r^F up, $\kappa > 0$

- The headline sets $\kappa = 0$ eq. IA.5; Table 8 notes. Allowing $\kappa \geq 0$, exposure term becomes 9.5 / 22.5 bp (Student-t) and 85 bp (normal, at the bound) Table IA.15, Panel B
- **Suggestion:** estimate κ from the Israeli forward data

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Comment 3: Is price impact a permanent constant?

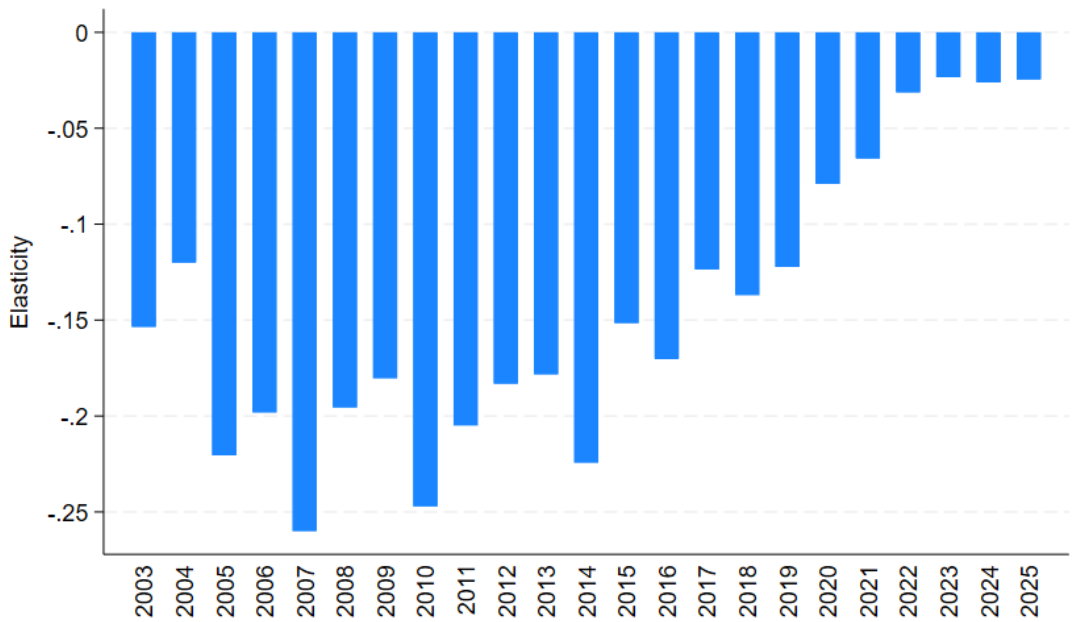
Estimate	bp per ILS bn	Source
IV, 3-month yield, 3-week window	2.71	Table 7, A(6)
IV, 6-month yield, 3-week window	2.67	Table 7, B(6)
6-month, 4 weeks later	2.04	IA.4.2
6-month, 8 weeks later	1.49 (AR incl. 0)	IA.4.2
2011: +12.8 bp ÷ ≈ILS 40 bn foreign exit (rough)	≈0.3	Table 4; Sec. 4 (calc.)

IA.4.2 = Internet Appendix Section IA.4.2. Last row: discussant's calculation

- The model takes the price impact term 1/B as independent of λ eq. 14 and applies a 3-week response at a monthly horizon Table 7 notes; Sec. IA.5.3
- The response decays: a transient impact read as permanent overstates 1/B, and thus foreign funding exposure
- 2011 implies an impact about ten times smaller. The paper credits banks still being present and responsive (larger B), so B moves a lot with who holds the bills (no securities lending)
- Exposure at the 2022 share (21.5–34.6 bp) relies on B(s) linear in the share, at 26.4% Table 8, Panel A; eqs. IA.6–IA.9
- **Suggest:** use 2011 and the Sep–Dec 2022 issuance surge (+ILS 65 bn, spread −93 bp) Table 2, Panel A as out-of-sample checks on B(s)
- Mexico evidence also suggests Demand slopes drift over time (next slide)

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Demand slopes drift: evidence from Mexico Cetes auctions



Annual average auction semi-elasticity of demand, Cetes. Source: Bush & Solís (2026), "Building Local Convenience," Figure 10.

- Bush & Solís (2026): demand slopes recovered from bid-level Cetes auction data
- Elasticity fell from about −0.2 (2005–14) to about −0.025 (2022–25), as the investor base shifted to domestic institutions
- Re Comment 3: the slopes that discipline the model may not be constant
- **Suggestion:** MAKAM is sold at BoI tenders. Bid data would give an alternative measure on how readily holders absorb bills, without needing a weak instrument
  - Caveat: an auction slope is not a market-clearing B; but could be used to check direction and timing

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Comment 4: Why only at three months?

Yield	Gradient (bp per 10 pp)	t
1-month	3.6	1.5
3-month (baseline)	**7.4**	**3.3**
6-month	1.1	0.4
9-month	3.1	1.3
12-month	3.1	1.3
4 maturities, balanced weeks	3.6	1.6

Source: Internet Appendix Table IA.6

- Foreigners tilt purchases across maturities by hedged spread Table 6, col. 1, so the mechanism should show at 6 months
  - The 6-month IV pass-through is 23 bp Table 7, B(3), yet the 6-month ownership gradient is ≈1 Table IA.6, Panel B
- The foreign share as a proxy for λ: correlation −0.80 with the bank share IA.2.1 and +0.85 with the passive-fund share IA.2.3; with passive terms, 14.5 (t = 1.7) Table IA.6, Panel D
- The share is an equilibrium outcome: a rising share may reflect a low r_F, not a larger λ
- **On the other hand:** the hedging component of r_F drives the result (7.2, t = 3.4), not the dollar rate (2.7, t = 0.2) Table IA.6, Panel D

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Comment 5: The 2011 reform…a clean causal test?

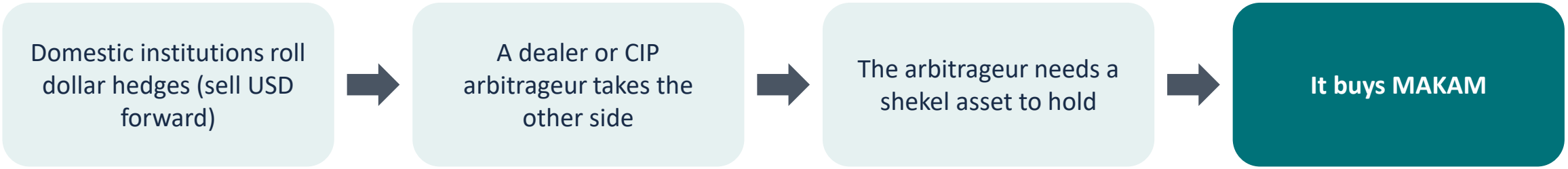
Specification (eq. 4)	γ (bp)	Source
Baseline, 1–24 months	12.8	Table 4 (1)
Quadratic maturity curve	10.9	Table 4 (2)
Common maturity slope	22.3	Table 4 (3)
1–12 months (5 exempt)	13.9	IA.8 (4)
3–24 months	**7.5**	IA.8 (6)
Leave one exempt bond out	10.7–16.6	Table 4 (5)
Placebo post dates: actual ranks	4th of 25	Sec. IA.3

47 affected bills vs. 7 exempt bonds, Jul 2009–Jun 2012. IA.8 = Internet Appendix Table IA.8. IMF (2011), "Recent Experiences in Managing Capital Inflows," Policy Paper, Feb. 14

- **Designed to stop the carry trade.** The tax repeal closed the direct channel; the 10% reserve requirement on FX swaps and forwards with nonresidents closed the synthetic one (cf. IMF, 2011, on Brazil) fn. 10
  - By the paper's own eq. (12), a common rise in r_F moves high-foreign-share MAKAM more, so the reserve requirement loads on γ. The +6.5 bp after 27 Jan may be this, not anticipation Sec. 4.2
  - Relative yields had fallen as foreigners entered Figure 5, Panel B: part of the rise may be the unwind of that inflow
  - Staggered: interest exemption ended 7 Jul, capital gains only 16 Dec 2011, around the August EM carry unwind
- **Thin control group.** 7 exempt bonds are the whole counterfactual; MAKAM exist only to 12 months, so 13–24 months rests on the bonds alone
  - Placebo rank 4/25 is a randomization p ≈ 0.16 discussant's calc, vs. bootstrap p = 0.015 Table 4
  - Foreigners may have moved into the still-exempt bonds, inflating γ
- **Maybe:** exempt bonds per month, their foreign holdings, matched pairs by redemption date, other EM bills in Aug 2011
- **Or:** consistent with "who holds MAKAM matters"; a case study, not a causal test of the funding channel

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Comment 6: What does the hedge-rollover instrument move?



- If the arbitrageur absorbing the roll is the MAKAM buyer, the instrument shifts foreign demand directly ($u = \psi Z$) eq. 7; Sec. IA.5.2
  - The paper's own Sec. IA.5.2: the r_F-IV then no longer equals funding-rate exposure; price impact dy/dF is still identified
  - The 18 bp Table 7, A(3) "causal pass-through" may be the price effect of the arbitrage trade itself: consistent with the story, but a different object
  - In Mexico, resident global banks drive the effect of hedging demand on the basis (Bush, 2023)
- Exclusion: long-term institutions sell ILS 0.29 bn of MAKAM per USD bn of maturities in the same weeks (foreigners buy 0.31 bn) fn. 19
- **Hard to do:** trace the chain in the FX data. What share of the rolled notional is absorbed by MAKAM-holding parents?

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Smaller points

- **Year-end pause:** the tender pause confounds supply, and at other quarter-ends the yield falls 5.3 bp (t = −1.6) Sec. 5.3; Table IA.13.
- **Model diagnostics:** the Normal-shock fit with feedback hits the coefficient bound (exposure ≈ 85 bp) Table IA.15, Panel B. Perhaps report it as a caveat.
- **Mexico.** Foreign FX-derivative positions track foreign Cetes holdings (Bush, 2023), which supports the hedged-investor reading. The share still counts all nonresidents and the one-month gradient is −0.6 Table IA.16; splitting hedged from unhedged holders could help
- **Horizons:** the evidence is weekly and the model monthly.
- **Exposition:** too long and hard to follow.
  - the draft includes many numbers, many regressions, and is repetitive, also some caveats and important details are in the Appendices. Rationalize what to include.
  - Perhaps start with the model and link empirical exercises clearly to the model implications.
  - One figure linking foreign share → exposure → funding term would be helpful, and highlight the foreign effect
  - Sample periods seem ad hoc and there are many in the paper, do you need them all? Detracts from the message.

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