# Shorting the Dollar When Global Stock Markets Roar: The Equity Hedging Channel of Exchange Rate Determination\*

Nadav Ben Zeev<sup>†</sup>

Daniel Nathan<sup>‡</sup>

Ben-Gurion University of the Negev, Israel

University of Pennsylvania and Bank of Israel, Israel

### June 20, 2024

### Abstract

This paper investigates the influence of global equity market value shocks on institutional investors' (IIs') hedging behavior and the resultant effects on exchange rates. Employing unique granular daily data on Israeli IIs' foreign exchange (FX) forward flows and prices and a granular instrumental variable estimation approach, we find that foreign equity market value shocks generate significant selling of U.S. dollar forwards by IIs, as a hedge against heightened FX exposure, along with significant exchange rate appreciation. A value-shock-induced one-standard-deviation increase in IIs' supply of forward flows appreciates IIs' forward rate by 0.53%. (JEL E44,F3,F31,G15,G23)

<sup>\*</sup>We are grateful to our discussants, Laura Alfaro and Nelson Camanho, Andrew Abel, Pedro Bento, Eliezer Bornstein, Gideon Bornstein, Dongho Choo, Nimrod Cohen, Harold Cole, Itamar Drechsler, Itay Goldstein, Andres Fernandez, Liran Halif, Amir Hatib, Zvi Hercowitz, Sunju Hwang, Urban Jermann,

We highlight a channel through which global equity market value shocks influence exchange rate variation: the collective hedging of foreign exchange (FX) risk by institutional investors (IIs), such as pension and insurance funds. This equity hedging channel of exchange rate determination is driven by the need for investors with foreign equity positions to hedge against increased FX exposure resulting from a rise in the value of their foreign equity positions. They do this by selling foreign currency on the forward market. However, the purpose of their selling is not to rebalance

(depreciation) of the ILS against the USD, as 80% of the average daily volume of IIs' FX forward trades is conducted in dollars. (The remaining 20%—over 14% of which is in euro—of IIs' trade

and Menkhoff et al. (2016) have found that changes in currency order flow can help explain a significant amount of the fluctuations in the exchange rate.

first is Melvin and Prins (2015), who assume that IIs' hedges are most typically adjusted once per month at the end of the month (around the 4 PM fix). Therefore, they use equity returns up until the second to last day of the month as a proxy for equity-price-induced hedging to test the relation between equity hedging and exchange rates for the 2004–2013 period for the eight most liquid currencies; they find a statistically significant negative relation, leading them to conclude that hedging demand plays a role in exchange rate determination. The second paper is Liao and Zhang (2020n, leading them to conclude to a sufficiently small economy so that a counteracting hedging mechanism from the world economy does not prevail and eliminate the local one. And, third, at the core of their debt hedging channel is a CIP-deviation-based mechanism stemming from global arbitrageurs' concave return from investment in non-swap related activity, an element which is omitted from our framework due to the insignificant IIs' cross-currency basis response to our GIV value shock (also see related discussion in Appendix A.5 of the Internet Appendix).

Intermediaries and Asset Pricing.

dollars on behalf of the public as of December 2020, which is 44% of the public's entire financial asset portfolio and 141% of GDP.

Regulatory

flows data. A salient feature of this figure lies in the broadly steady rise in the share of total assets being allocated to foreign assets (solid line), which peaks in June 2021 at 31.7%. By contrast, and not surprisingly given foreign equities values' relatively large fluctuations, foreign equities as share of foreign assets (round dotted line) exhibit much less stability; especially notable are the There are two noteworthy facts that are borne out by Figure 2. First, Israeli IIs conduct meaningful hedging through selling dollar forwards, as reflected by the significant accumulation of IIs' dollar forwards sold which reaches a peak of 77.8 Billion dollars at the end of the sample. Second, IIs also appear to be quite active on the spot market, as such spot activity enables them to fund their foreign asset investments (the other such funding device being FX swaps (Ben Zeev and Nathan (2023)

# 4 Methodology

This section elucidates the methodology used in the empirical analysis undertaken in this paper. We first describe the data used in the estimation after which we turn to present the general lines of the estimation.

### 4.1 Data

being translated into dollar quantity and USD/ILS rate terms, respectively.

**Forward Flows and rates.** The flows variable measures (in dollars) the daily net transaction flow from IIs' buying and selling of U.S. dollars on the FX forward market. There is a negative

constituents which in turn represent all companies with a sufficiently long sample period as S&P 500 stayers for estimation purposes. (The shortest sample across the 774 constituents covers 116 daily observations.) These constituents' returns are used as dependent variables in constituent-

We use its log-first-differences (in lagged and current form) in the constituent-level regressions to

#### 4.2.1 Econometric Model

**Constituent-Level Specification**. We estimate (via OLS) 774 constituent-level regressions given by

$$\mathsf{DSP}_{i,t} = \mathsf{C}_t^{\ell} g_i + \mathsf{v}_{i,t},\tag{1}$$

where  $DSP_{i,t}$  is the log-first-difference of constituent *i*'s stock price;  $C_t$  is a vector of observable controls that includes the fixed effect, time trend, day-dummies for Monday through Thursday, lagged values of  $DSP_{i,t}$ , and current and lagged values of the following exogenous controls:<sup>12</sup>

of the USD/ILS forward market, given by

$$Dfr_{t} = d_{0} + d_{1}T_{t} + qff_{t} + e_{t}.$$
(4)

In our empirical analysis we will show OLS estimation results for Equations (2) and (3) as well 2SLS estimation results for structural supply Equation (4) using either  $g_{GIV,t}$  or

value shock.

**IIs' Spot Rate, Spot Flows, and Cross-Currency Basis.** Table 4 shows the responses of IIs' aggregate (volume-weighted average) spot rate, aggregate spot flows, and aggregate (volume-weighted average) cross-currency basis to the GIV value shock.<sup>14</sup> To obtain these responses we simply replace the log-first-diffe-

table also shows the response of IIs' forward flows.) To obtain these responses we simply replace the log-first-difference of IIs' forward rate from Equation (3

series from the II-level regressions and then conducts the analogous estimation from Table 2 that was applied to the GIV and Bartik value shocks. We now present the results from this estimation.

81%, or 0.6 standard deviation units of IIs' forward flows) of the forward dollars sold by IIs).<sup>17</sup>

In other words, the results indicate that local banks' demand curve is considerably flatter than that of the real sector, resulting in a vastly smaller estimated semi-elasticity for the much larger (in terms of supply increase) forward supply shock relative to the value shock whose associated sup-

## 6 Conclusion

This paper documents a significant response of IIs' selling of foreign currency forwards in re-

**Code Availability**: The replication code could not be shared because of the proprietary nature of the data. Permission was provided by the editor.

## References

Goldsmith-Pinkham, P., Sorkin, I. and Swift, H.: 2020, Bartik instruments: What, when, why, and how, *American Economic Review* **110** 

- Lilley, A., Maggiori, M., Neiman, B. and Schreger, J.: 2019, Exchange rate reconnect, *Review of Economics and Statistics* pp. 1–28.
- Lustig, H., Roussanov, N. and Verdelhan, A.: 2011, Common Risk Factors in Currency Markets, *The Review of Financial Studies* **24**(11), 3731–3777.
- Maggiori, M., Neiman, B. and Schreger, J.: 2020, International currencies and capital allocation, *Journal of Political Economy* **128**

Table 1: Descriptive Statistics for IIs' Forward and Spot Flows and Rates.

	GIV Shock							
Response	OLS	2SLS 1 <sup>st</sup> Stage	2SLS 2 <sup>nd</sup> Stage	Reduced Form				

### Table 2: GIV and Bartik Value Shocks Estimation Results.

Table 5: Sectoral Forward Flows Responses to the GIV Value Shock.

Table 7: Sectoral Forward Flows Responses to the GIV Forward Supply and Value Shocks.

\_

GIV Forward Supply Shock							
	lls	Real	Banks	Foreign	Financial		
Response	-0.74***	0.08***	0.60***	0.00	0.05***		

Figure 1:





