Non-Fundamental Flows and Foreign Exchange Rates

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Abstract

Frequent, yet uninformed, fund flows in Chilean pension plans generate substantial trading in currency markets due to the plans' high international diversification. These non-fundamental flows have a significant impact on the Chilean exchange rate, which is estimated to have a relatively low price elasticity of 0.81. Hedging by the banking sector propagates the price pressure to currency forward markets and results in violations of the covered interest rate parity (CIP). Using bank balance sheet and trading data, we confirm that regulatory capital requirements and banks' risk bearing constraints create limits of arbitrage.

Keywords: exchange rates; CIP deviations; pension funds; market efficiency

JEL Codes: F31; G14; G15; G21; G23

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1 Introduction

According to traditional asset pricing theories, the price of a financial asset should only change when investors revise their expectations on future cash flows or discount rates. The "inelastic market hypothesis," recently proposed by Gabaix and Koijen (2021), however, predicts that asset prices, even at the macro-level, respond to day-to-day investment flows. If funds hold international assets for diversification purposes, fund flows may also generate flows to the currency markets. Taking advantage of several unique features of the Chilean pension system, we aim to quantify the price-elasticity of demand in the currency market and to explore limits of arbitrage by studying how currency shocks influence violations of the covered interest rate parity (CIP).

The Chilean pension system allows investors to freely allocate their investments across funds with different risk levels (from 100% in equity to 100% in bonds and various mixtures in between). A financial advisory firm called Felices y Forrados (FyF, which translates to "Happy and Loaded") started in 2011 to cater to the demand of individual investors to time the market. Between 2011 and 2019, FyF has sent out 80 fund reallocation recommendations, averaging 9 per year. Da, Larrain, Sialm, and Tessada (2018) (DLSY hereafter) show that these recommendations are largely uninformative, as they do not predict future returns, which we confirm over our longer time period. Instead, the financial advisory firm serves as a coordination device among individual investors. As an illustration, Figure 1 shows the FyF recommendations (depicted with vertical lines) and the daily flows to pension fund A during 2018. The largest spikes in the aggregate pension flows almost always coincide with FyF recommendations. Buy recommendations (depicted with the dotted lines) are associated with inflows to fund A and sell recommendations (depicted with the solid lines) are associated with outflows from fund A.

Such fund reallocations generate large amounts of uninformed trading in Chilean pesos. This is because the stock funds with average assets of around US$28 billion, corresponding to more than 10% of Chilean GDP, routinely invest 75% of their portfolio in international

equities. Therefore, a 3% daily fund flow results in the need to trade about US$630 million worth of Chilean pesos, roughly 0.36% of the money supply (M2). Empirically, we document this 0.36% flow moves peso's exchange rate by 0.44%, translating to a relatively low price-elasticity of 0.81. For comparison, DLSY documents a similar price-elasticity of 0.45 in the Chilean stock market. Both estimates support the inelastic market hypothesis of Gabaix and Koijen (2021).

By examining the trading volume data reported by the Chilean central bank, we confirm that the local banking sector trades against the pension funds in the spot pesos market. The local banks then hedge their currency exposure by taking offsetting positions against foreigners in the OTC forward markets. Thus local banks effectively propagate the flow-induced shocks from the spot market to the forward market. To the extent that the price-elasticity is different across these two markets and spot and forward market trading is not perfectly synchronized, we also find the flow-induced exchange rate shocks lead to deviations from the covered interest rate parity (CIP).

Given the difficulty for foreign investors to trade in the Chilean pesos spot market, local banks appear to be in a good position to arbitrage CIP deviations. However, consistent with Du, Tepper, and Verdelhan (2018) and Du, Hébert, and Huber (2021), we find that they do not eliminate these deviations due to limits of arbitrage arising from "balance sheet costs." Following the great financial crisis, banks are required to maintain minimum capital ratios against all assets, including those involved in arbitrages. Such capital requirements impose costs for low-margin, balance-sheet intensive, low-risk investment strategies such as trading against CIP violations, especially when the arbitrageurs have to hold the positions over the end of a quarter when assets are often measured.

We find that FyF recommendations cause greater CIP violations around quarter ends, consistent with the balance sheet cost channel. Since many Chilean public holidays also happen around quarter ends, limited attention on the part of arbitrageurs and uncertainty around holidays may also contribute to greater CIP violations. Nevertheless, we find the

quarter-end effect remains significant even after controlling for holiday indicator variables. Unlike Du, Tepper, and Verdelhan (2018), our setting also reveals the initial source of the CIP violations. Limits to arbitrage can arise from banks' risk-bearing constraints. Consistent with such constraints, we find that CIP deviations are particularly large when the banks experience a negative shock to their capital, consistent with He, Kelly, and Manela (2017).

Our paper contributes to several strands of literature. First, it contribute to a voluminous literature documenting price pressure in various asset classes (see the references in Gabaix and Koijen (2021)). Supporting the theoretical framework in Gabaix and Maggiori (2015), we find that the currency demand curve is also downward sloping. In this regard, our empirical findings are most closely related to Hau, Massa, and Peress (2010) and Pandolfi and Williams (2019), who document the exchange rate response when a country's stocks or bonds are added to or re-balanced in popular indices. In contrast, we examine 82 FyF non-fundamental demand shocks that alternate between large inflows and large outflows in the currency market. These repeated non-fundamental, sizable and quantifiable shocks allow us to estimate the price-elasticity in the currency market.

Our paper also contributes to an equally voluminous literature on exchange rates. The prize-winning paper by Itskhoki and Mukhin (2021) highlights the important role of noise traders, risk averse intermediaries, and limits of arbitrage in the currency market. Our unique setting and detailed data offer a rare opportunity to showcase the interaction between noise traders (pension funds acting on FyF recommendations) and financial intermediaries (local banks). We find hedging activities by banks can cause CIP violations. Limits to arbitrage arising from regulatory cost and banks' risk bearing constraints explain why the violations do not go away immediately. Our findings complement those in Cenedese, Della Corte, and Wang (2021), Wallen (2022), Du and Schreger (2021) and the references therein.

The rest of the paper is organized as follows. Section 2 describes the data. Section 3 explains the empirical strategy and reports the main results. Section 4 concludes.

2 Data

We compile our data set from multiple sources: prices and interest rates, the balance sheet of the banking system, trading volume, pension funds, and the advisory firm FyF.

2.1 Prices and Interest Rates

We get most market data from Bloomberg. The daily spot (S) exchange rate is measured in Chilean pesos per U.S. dollars. The one-month forward (F_{1m}) mid-point price is measured at closing, and it corresponds to the price on over-the-counter forward contracts. These contracts can be opened (or they can expire) on any day, and not solely on a set day during the month. All contracts are non-deliverable forwards, meaning that they have to be settled in dollars and not in Chilean pesos.[1] Interest rates correspond to the 30-day LIBOR rate (r_{us}) in U.S. dollars and the local 30-day interbank interest rate in Chilean pesos (r_{chile}).[2]

With these data we define the one-month cross-currency basis (CCB_{1m}) as:

$$CCB_{1m} = 100 \times \frac{360}{30} \times \left[1 + r_{us} \times \frac{30}{360} - \left(1 + r_{chile} \times \frac{30}{360}\right) \times \frac{S}{F_{1m}}\right] \tag{1}$$

CCBs at other horizons are defined analogously. We get the CCB at the 3, 6, and 12 month horizons from the Central Bank of Chile.[3] However, most of our tests deal with the one-month CCB since this is the most liquid forward contract available.

In a world of frictionless arbitrage, the covered interest parity (CIP) relationship implies that the CCB_{1m} should be zero at all times. This is not the case in practice as seen in Figure 2. The CCB is often negative in this sample, which implies that it is in principle beneficial for an investor with U.S. dollars to exchange the dollars into Chilean pesos, take a deposit

[1]The Chilean peso was not a deliverable currency during our sample period, however this changed in December 2020: https://www.bcentral.cl/en/content/-/details/the-central-bank-of-chile-authorizes-the-use-of-the-chilean-peso-in-cross-border-transactions.

[2]Bloomberg tickers are as follows: CLP BGN Curncy (spot), CHN1M Curncy (forward), US0001M Index (Libor), and CLTN30DN Index (Chilean interest rate).

[3]All central bank data can be downloaded from https://si3.bcentral.cl/siete. We are able to match the 3-month CCB reported by the Central Bank with Bloomberg data, but there is no data available in Bloomberg to compute the 6- and 12-month CCBs. The Central Bank does not report the 1-month CCB.

in Chilean pesos, and hedge them back to U.S. dollars than to take a U.S. dollar deposit directly at the LIBOR rate.

Insert Figure 2 here

Table 1 shows the summary statistics for the main variables in our analysis. The average (median) one-month CCB is -0.36% (-0.29%). The average (median) spread between the one-month U.S. LIBOR and the Chilean rate is -3.42% (-3.55%).

Insert Table 1 here

We can decompose the CCB in equation (1) into an interest differential and a forward spread component:

$$CCB_{1m} = 100 \left[(r_{us} - r_{chile}) + \frac{360}{30} \times \left(\frac{F_{1m} - S}{F_{1m}} \right) \times \left(1 + r_{chile} \times \frac{30}{360} \right) \right] \tag{2}$$

We define the *Forward Spread* as:

$$ForwardSpread = 100 \times \frac{360}{30} \times \left(\frac{F_{1m} - S}{F_{1m}} \right) \tag{3}$$

One way to understand this spread is that it captures the cost of borrowing dollars. An increase in the forward spread implies that the cost of paying for those dollars in one month instead of paying for them in the spot market is increasing. We normalize the difference between the forward and the spot price by the forward price so the forward spread ratio results from the decomposition of the CCB ratio.[4]

The above equation shows that a non-zero CCB can either arise from differential interest rates or a non-zero forward spread. When interest rates are zero, CCB is equal to the forward spread.

[4]This normalization by the forward price differs from the more common normalization which divides the difference between the forward and the spot price by the spot price. However, the difference is relatively small since forward and spot prices do typically do not differ substantially at short horizons as considered in our paper.

2.2 Balance Sheet of the Domestic Banking System

The CMF (Comision para el Mercado Financiero) is the regulator of financial markets in Chile. It regulates banks, insurance companies, exchanges, and issuers of financial securities. At the monthly level, it reports the amount of equity, and the ratio of equity to risk-weighted assets in the aggregate balance sheet of the Chilean banking system.[5]

2.3 Trading Volume and Banking Imbalances

The Central Bank of Chile reports trading volumes in the spot and forward markets in two ways. First, at the monthly level, it reports the total amount bought and sold of foreign currencies between banks (and other authorized participants of the formal market) and their counterparties: pension plans (AFPs), insurance companies, mutual funds, foreigners, firms, and others. All foreign currencies are aggregated into a single amount, but U.S. dollars represent the lion's share of the volume. The trading volume in the forward market is between 1.5 and 2 times larger than the trading volume in the spot market. Foreigners account for most of the trading in the forward market. Many foreigners trade solely on the forward market since forward contracts are settled exclusively in U.S. dollars. Trading on the spot market requires opening accounts in Chilean pesos at a local bank.

Second, at the daily level, the Central Bank of Chile reports the total amount bought and sold of foreign currencies between the banking sector and third parties. The daily data is not split by type of counterparty like the monthly data. We define the daily imbalances of the banking sector as the difference between the amount bought and the amount sold in each market. As seen in Table 1, the average (median) imbalance in the spot market is 0.01% (-0.02%) of the equity of the banking sector, while the average imbalance in the forward market is -0.23% (-0.19%). The net imbalance, which is obtained by simply adding the imbalances in both markets, is -0.22% (-0.22%).

The Central Bank also reports data for the net positions of the banking system at a

[5]The CMF data can be downloaded from www.cmfchile.cl.

daily frequency. These are accounting measures of the stock of foreign currency (spot) and forward contracts in the banking sector. A negative net spot position implies that banks are borrowing foreign currency to sell in the local spot market. *Changes* in the net position correspond basically to the amount bought minus the amount sold by banks in each market. This is exactly the case in the spot market. The net position in the forward market encompasses the notional value of all open contracts at each point in time. Hence, the net forward position also varies with the expiration or closing of previous contracts, and not just with the origination of buy and sell contracts.[6]

Insert Figure 3 here

Figure 3 shows the outstanding net positions of the banking system in the spot and forward markets. The net position in the spot market is always negative, while the net position is the forward market is always positive and almost a mirror image of the spot position. This shows that banks hedge their spot positions in the forward market, and vice versa. Hedging follows from risk management practices and is also required by regulation. The overall net exposure (spot plus forward) is close to zero, although it is consistently negative in the second half of our sample. The negative net exposure shows that local banks are systematically short US dollars.

2.4 Pension Funds

Private pension fund administrators (AFPs, from their acronym in Spanish) are regulated and supervised by the Superintendencia de Pensiones (SP). There are between six and seven AFPs operating throughout the sample period that we study. Each AFP has to offer five types of funds (A through E) with different risk profiles set by regulation. Risk is defined in terms of the maximum investment that is allowed in equity, for example, 80% of the

[6]Most forward contracts simply expire instead of being closed in advance. Rather than settling an open contract, banks take contracts in the opposite direction in order to effectively close out their positions.

portfolio in fund A, 40% in fund C, or 5% in fund E. Equity investment above those thresholds is permitted only under special circumstances. There is also a limit on foreign asset holdings for the aggregate portfolio of all funds managed by each AFP. By 2011 this limit stood at 80%. The SP makes available a wealth of information about AFPs on its website (www.spensiones.cl). At the monthly level for each type of fund (i.e., A-E), we obtain the portfolio composition, in terms of broad assets classes and the split between foreign and domestic investments, and some demographic information about investors.

Table 2 shows the average size of the five funds offered in the pension system. The total assets under management, amounting to approximately 175 billion USD, represent more than 65% of Chilean GDP. Fund C, which started earlier than the other other funds, is the largest with US$65 billion assets under management. There are close to 11 million people investing in the pension fund system, which represents 93% of the working-age population. At the system level, close to 40% of the assets under management are invested in foreign assets. The proportion of foreign investments equals 75% for fund A and decreases monotonically to only 6% of fund E. Thus, switches between funds A and E generate large flows of Chilean pesos. Around two-thirds of foreign currency investments are held in equity securities (i.e., 28.1%/41.6%) and around 70% of equity investments are invested in foreign equities (i.e., 28.1%/39.8%).

Insert Table 2 here

At the daily level (t), we get the fund share price (P_{ikt}) and assets under management (AUM_{ikt}) for each fund type i (A-E) offered by AFP k. From there we define the daily flow as:

$$Flow_{ikt} = \frac{AUM_{ikt}}{AUM_{ikt-1}} - \frac{P_{ikt}}{P_{ikt-1}} \tag{4}$$

According to Chilean regulations, investors are free to request their AFP to transfer their savings between funds.[7] These requests are typically filed online. The AFP has up to day

[7]Beyond voluntary transfers, there are transfers between funds that are triggered by the age of the

t+4 after the request to move the amount between funds, although the transfer is executed at share prices of day *t+2*. For example, an investor with N_A shares of fund A and who requests a transfer to fund E will be able to buy $N_A \times \frac{P_{At+2}}{P_{Et+2}}$ shares of fund E. The AFP has to delay switches between funds when the volume of transfer requests is too big. In particular, the excess flow above 5% of the AUM_{ikt} has to be postponed until the next day. For example, an outflow above 20% of the AUM_{ikt} takes up to day *t+8* to be fully implemented. Transfers are organized on a first-come-first-served basis.

2.5 Felices y Forrados

Felices y Forrados (FyF; translated as "happy and loaded") gave recommendations to its on-line subscribers about the best pension fund to hold at each point in time. Subscribers received an email telling them to sign into the FyF website when a new recommendation was issued.[8] After seeing the recommendation investors could request their AFP to implement the switch. The request had to be filed on the platform of each AFP, not in a centralized FyF platform. FyF recommended types of funds (A through E, or combinations of them) instead of particular AFPs. Table 3 shows the 82 recommendations that FyF issued between July 2011 and the end of February 2020. There was a new recommendation approximately every 6 weeks between 2011 and 2017. Then, in 2018, the frequency increased to approximately one recommendation every 2 weeks. Most recommendations (69) involve moving towards or away from fund A. The rest (13) recommend moves between funds C, D, or E. Fund B has never been recommended.

Insert Table 3 here

Figure 1 shows the flows to the aggregate fund A of the Chilean pension system in 2018. Vertical lines mark dates of FyF recommendations, for the year 2018 as an illustration.

investor if the investor has always taken the default option defined by the regulation. For example, fund B is the default option for men and women up to 35 years old. Both are moved to fund C when they turn 36. Funds A and E are not default options under the Chilean regulation, hence flows to and from these funds need to be initiated by the participants.

[8]Their website, which is now mostly inactive, is www.felicesyforrados.cl.

Most spikes in flows are preceded by FyF recommendations, and with the correct sign, i.e., recommendations to move towards (away from) fund A precede large inflows (outflows). Flows after FyF recommendations can be as high as 3% (e.g., after November 11, 2019), while on non-recommendation dates the average flow is close to zero. This illustrates the high popularity of FyF, most of which was achieved with effective campaigns on social media. Curiously, their rhetoric was often anti-system, e.g., "let's beat pension funds at their own game."

Insert Figure 1 here

The service offered by FyF started in July 2011 and closed in June 2021 after Chilean regulators imposed restrictions and capital requirements for firms offering this type of financial advise. We only study FyF recommendations and their potential market impact up to the end of February 2020. The more recent period is excluded for two reasons that change the nature of the experiment at hand. First, although the SP advised against frequent changes in pension funds as early as 2013, the tension between the FyF and SP escalated after the outbreak of the Covid crisis in March 2020, both in terms of tone and public notoriety. This likely undermined FyF's reputation. Second, and more importantly, the Chilean pension system faced three big withdrawals (in July 2020, December 2020, and April 2021) permitted by regulators to smooth the Covid shock. These withdrawals amounted to more than 50 billion U.S. dollars.

FyF never disclosed the model – statistical or conceptual – that underlay their recommendations. Their marketing material only argued that the recommendations were tailored to avoid losses such as those of 2008. In Table 4 we report a linear probability model to estimate the likelihood of switches in FyF recommendations towards fund A. The dependent variable takes values between 1 and -1. For example, if previously FyF recommended 50% of funds to be invested in Fund A and 50% in Fund E, and then FyF switches the recommendation to invest 100% in A, then the dependent variable takes a value of 0.5. We use as explanatory variables the past returns in funds A and E, together with previous changes

in the foreign exchange rate, the price of copper, and macro variables such as interest rates and inflation. We find that FyF bet on the momentum of one-week returns of fund A, and on the reversal of 2- and 3-week returns. Besides the importance of past returns, there is little explanatory power of the other variables included in Table 4, as evident by the small regression R-squares.

Insert Table 4 here

The SP questioned the ability of FyF to deliver superior returns almost from the start. FyF responded that performance from their first recommendation was better than buy-and-hold strategies of any of the other funds. However, their response did not take statistical significance into account, nor the experience of subscribers that started following FyF from later recommendations. Table 5 reports average returns for investors that follow FyF recommendations in comparison to funds A, C, and E. We assume investors request a switch of their pension fund the same day that the FyF recommendation is issued, and that the switch is implemented at the prices on day *t+2*. We show the results for several hypothetical FyF subscribers depending on when they started following the recommendations (e.g., from recommendation number 1, 10, 20, etc.). Investors who followed FyF from the first recommendation had better performance than investors who were invested passively in fund C (approximately 16bps per year) and in fund E (approximately 86bps per year) and worse performance than investors who invested passively in fund A (approximately 15bps per year). The differences are, however, far from being statistically significant, as reported by the t-statistics in parentheses. Additionally, the experience of subscribers who started from later recommendations is many times negative. For example, investors who started following FyF from recommendations 10, 20 or 30 had lower returns than those that passively invested in funds A or C. The performance of FyF was again better than the passive strategies for subscribers who started with recommendation 40 at the end of 2017, although the difference is never statistically significant. Overall, it is hard to argue that FyF had access to superior information or a superior predictive model.

Insert Table 5 here

3 Results

In this section we discuss our main results relating pension flows to exchange rates.

3.1 Pension Fund Flows

In order to estimate the effect of FyF on pension fund flows we run the following time-series regression for each type of fund i (A-E) at the aggregate level:

$$Flow_{it} = \sum_{\tau=1}^{\tau=10} D_\tau + \sum_{j=1}^{j=5} \beta_j Flow_{it-j} + \sum_{j=1}^{j=5} \delta_j Return_{it-j} + \epsilon_{it} \tag{5}$$

The indicator variable D_τ is equal to 1 (-1) on day τ after a recommendation of FyF to move to (away from) fund A, and zero otherwise. We include indicator variables for the first ten trading days after a recommendation is issued (day τ=0).[9] In some regressions we add as controls the five lags of flows and returns for each pension fund.

Insert Table 6 here

The results are shown in Table 6. In columns (1)-(3) we show the impact on the aggregated flows towards funds A, C, and E for all AFPs. There is no visible impact on the first three days, which fits well with the delay of four days that regulation gives AFPs to accommodate switching requests. On day 4 we find a significant inflow of 1.69% towards fund A, and a significant outflow of 2.64% away from fund E. Significant flows to fund A and away from fund E continue for several days, which can be expected if investors slowly react to FyF recommendations, although the magnitudes are substantially smaller in subsequent

[9] In a few cases there is overlap in the post-recommendation window for two consecutive FyF emails. In terms of the dummy variables for post-recommendation days, the second email takes precedence. For example, a recommendation might be issued on day 8 after a previous recommendation. Under our definition, the next day is labeled as day 1 instead of day 9.

days. For example, in column (1) the coefficient on day 10 is less than 5% the coefficient on day 4. The coefficients on fund C are the same as those on fund A, and are occasionally significant (say on day 6 and 7), suggesting that some investors are also following the recommendation approximately and apply it to both funds A and C. Importantly, the coefficients (in absolute terms) on fund C are orders of magnitude smaller than those on funds A and E, so the majority of investors are following FyF recommendations exactly. Columns (4)-(6) repeat the analyses in columns (1)-(3) with control variables. Adding control variables hardly changes the coefficients.

In columns (7)-(9) we show the effects for the funds of Modelo, a relatively small AFP that started in 2007. Modelo has a relatively young investor base because it was awarded the first government auctions of the portfolios of young people entering the labor market. By having young, internet-savvy investors, this AFP is more likely to be affected by FyF switches. The coefficients are larger in magnitude compared to columns (1)-(3).

In columns (10)-(12) we use as the dependent variable an indicator variable equal to one for flows of 5%, which is the upper bound on daily flows allowed by the regulation.[10] As seen in column 10, 5%-flows to fund A are 19% *more* likely on day 4, and there is little effect on the rest of the days. As seen in column 12, 5%-flows to fund E are 31% *less* likely on day 4.

Overall, large flows are related to FyF recommendations, and with the direction implied by those recommendations. Flows are exceptionally large in comparison to the average flow on any given day. The 5% upper bound is frequently hit in small AFPs after a recommendation issued by FyF. Excess flows are observed in a tight window between days 4 and 8, which fits well with the constraints derived from the Chilean regulations of pension funds.

3.2 Foreign Exchange Rate

In this section we discuss the impact of recommendations on the foreign exchange rate.

[10] We allow for a difference of ±0.1% around the 5% threshold since we can only measure flows ex-post and not in real time like the pension funds.

3.2.1 Event study

As previously mentioned, foreign investments represent, on average, 75% of assets for fund A. Thus, a recommendation to move towards (away from) fund A implies that pension funds have to buy (sell) a significant amount of foreign currency. In Panel A of Figure 5 we report the results from an event study with the 69 recommendations issued by FyF that involve fund A. Day τ=0 in the figure is the day that FyF sends an email to subscribers with the new recommendation. We plot the subsequent cumulative depreciation of the foreign exchange rate. The event study is shown from the perspective of emails that recommend a reallocation towards fund A. We multiply all variables by minus one when we consider FyF emails that recommend a reallocation away from fund A. Then we average across all events for each event day.[11]

Insert Figure 5 here

We find that the exchange rate depreciates significantly in the first five days by approximately 0.45%. The effect is approximately two-thirds of the standard deviation of the exchange rate in our sample. The reversal is relatively slow in terms of point estimates, although the statistical significance disappears after ten days. Thus, the required purchases of foreign currencies after recommendations to shift to the risky fund lead to a depreciation of the Chilean peso and an appreciation of the U.S. dollar.

3.2.2 Time-Series Regressions

To investigate the relation between exchange rate changes and asset allocation recommendations, we run the following times-series regression:

$$\Delta FX_t = \sum_{\tau=1}^{\tau=10} D_\tau + \sum_{j=1}^{j=5} \alpha_j \Delta FX_{t-j} + \Gamma' X_t + \xi_t \tag{6}$$

[11] We show up to 30 event days in Figure 5, which can imply overlapping event windows in the case of frequent recommendations. The time-series regressions in Table 7 are not overlapping.

The dependent variable is the daily percentage change in the foreign exchange rate. Our main interest is in the coefficients on the indicator variables for days after FyF recommendations. In some regressions we also include five lags of the dependent variable and a vector X_t with several control variables: 30-day lags of the domestic and U.S. inflation rates, domestic and U.S. three-month interest rates, the size of the balance of the Chilean Central Bank, and the daily percentage change in the international price of copper. Copper represents approximately 40% of Chilean exports, and hence changes in the price of copper are closely associated with the foreign exchange rate.

Insert Table 7 here

In column (1) of Table 7 we run the regression without controls and find a strong foreign exchange depreciation on the first two days after a recommendation (0.22% and 0.23% respectively). Interestingly, while the pension flows in Table 6 are delayed by four days, the foreign exchange prices react immediately to the recommendations. The delay in actual flows is caused by the delayed settlement of pension fund reallocations, while prices react immediately.

The effects are hardly sensitive to adding controls (column (2)) or restricting the sample to when the forward price is available (column (3), which for the most part excludes days where the U.S. market is closed because of holidays). The cumulative depreciation in the first five days ranges between 37bps (without controls in column 1) and 45 bps (with controls in column 2). The effect on the first five days is statistically significant regardless of the specification. The cumulative effect on the next five days is positive and ranges between 24 (without controls in column (1)) and 30 bps (with controls and limited sample in column (3)), but the effect is not statistically significant.

In Table 8 we explore several sample splits to better understand the effects of FyF recommendations. First, we compare the effects after buy and sell emails, where buy (sell) refers to FyF recommendations to move towards (away from) fund A and therefore to buy (sell) foreign currency. Indicator variables after buy and sell recommendations are 1 and

-1 respectively, so although in opposite direction, the coefficients can be compared across recommendation types. In columns (1) and (2) we find that the effects on the foreign exchange rate are similar after buy and sell recommendations.

Insert Table 8 here

Second, we split the sample in the early years of FyF (2011-2015) and the later years (2016-2020). FyF were more active (higher email frequency) and more popular (more followers; larger flows) in the later years. Not surprisingly, the effects are stronger in the later part of the sample.

Third, we focus on FyF recommendations that are sent out near the end of a quarter, specifically, between the 24th and the last day of March, June, September, or December. The end of the quarter can be relevant if constraints on the balance sheets of banks are more binding during these days (Du, Tepper, and Verdelhan, 2018)). The foreign exchange effects arrive faster at the end of the quarter. The five-day depreciation of the foreign exchange rate is stronger at the end of the quarter than in other days (1.49% vs. 0.40%).

Finally, in column (7) we exclude periods when the Central Bank of Chile has officially intervened in the foreign exchange market. The foreign exchange is typically free to float, but during the year 2011, and between November 29, 2019 and the end of our sample (February 29, 2020) the Central bank intervened actively. The motives for the interventions were different. During 2011 the objective was to increase the exchange rate and alleviate the pressure from exporters, while in 2019 it was to devalue the exchange rate after a period of unusually high uncertainty from social unrest. Excluding both of these periods does not take away from our main results.

3.2.3 Currency Price Elasticity

The large and frequent trading in Chilean pesos arising from uninformed pension flows provides a unique setting for us to estimate the currency price elasticity. We proceed in several steps:

We estimate the average U.S. dollar trade size by pension funds to be $624 MM, obtained by multiplying: (a) Fund A' average AUM of $27,587 MM (Table 2 Panel A), (b) 3.01% flow towards fund A (CUM[1-5] from Table 6), and (c) 75.2% of fund A's foreign investment (Table 2 Panel B). The trade size represents 0.36% of the Chilean M2 aggregate money supply (the average is $175,000 MM during 2011-2020).

The resulting Chilean peso depreciation, according to column (6) of Table 7 (CUM[1-5]), is 0.45%. Therefore, the price elasticity of the Chilean peso is -0.81 (= - 0.36%/0.44%). The estimate implies an inelastic demand curve for the currency. For comparison, Da, Larrain, Sialm, and Tessada (2018) documents a price-elasticity of -0.45 in the Chilean stock market. Both estimates support the inelastic market hypothesis of Gabaix and Koijen (2021).

3.3 Banking Imbalances

In this subsection we study how the FyF recommendation shocks are transmitted to spot and forward markets through the banking system. In Figure 6 we show the monthly amount bought minus the amount sold of foreign currencies from the local banks by counterparties (i.e., pension funds, foreign entities, brokers, insurance companies, mutual funds, firms, others). Light red (dark blue) bars correspond to months with a net increase (decrease) in fund A according to FyF recommendations. We subtract from each bar the average banking imbalance with each counterparty in months without changes in FyF recommendations.

Insert Figure 6 here

In Panel A of Figure 6 we see that pension funds are selling (buying) approximately $600 (750) million to banks in the spot market in months with a net decrease (increase) in fund A. In panel B we see the mirror image in the forward market, where foreign entities are buying (selling) approximately $700 (1,300) million from banks in months with a net decrease (increase) in fund A. Hence, there is more volume in the forward market than the volume directly implied by the hedging needs of banks from the spot market. One possible

interpretation is that foreigners provide liquidity against pension fund flows. The other counterparties are not providing much liquidity to accommodate FyF flows. It is worth noting that pension funds are not very active in the forward market after FyF recommendations.

Insert Figure 7 here

Figure 7 shows in stylized form the flows that FyF emails induce. A recommendation to switch towards fund A increases the demand of pension funds for foreign currency in the spot market. Local banks meet the demand of pension funds by selling in the spot market. However, in order to hedge their positions, banks turn to the derivatives market where they buy forward dollars from foreign entities (most likely foreign banks). At the end of the day, foreigners supply liquidity to the pension funds through the local banks in the forward market. Most foreigners do not provide liquidity directly to pension funds since they do not participate in the spot market.

Insert Figure 8 here

The volume data by counterparty is informative, but it only comes at a monthly frequency. At a daily frequency we can compute the total imbalance of the banking sector and link the effects more directly to the timing of FyF recommendations. In Figure 8 we show the cumulative daily imbalance (buy minus sell) of the banking sector in the spot and futures markets after FyF recommendations. In the top panel we show the effects in millions of U.S. dollars, while in the lower panel we show the effects in terms of equity of the banking sector. We find that banks sell spot foreign exchange approximately equal to $600 million (1.8% of their equity) in the ten days that follow a recommendation to move to fund A. At the same time, banks buy approximately US$ 700 million (2% of equity) in the forward market.

Insert Figure 9 here

Another indication of the correlation between pension fund movements and the banking imbalances is given in Figure 9. We first compute the implied daily FX flow of pension funds

as the multiplication of the daily flow to or from each fund times the fraction invested in foreign assets in each fund. We add this up over the 10 days that follow a recommendation from FyF. We then correlate this implied FX flow with the net sales of banks on the same 10 days. The estimated beta of the linear relationship in Figure 9 is 0.55, showing that the correlation is strong and positive. The figure confirms that local banking system serves as the intermediary to pension funds in the spot market.

Insert Table 9 here

In Table 9 we show the time-series regressions with daily banking imbalances as dependent variables. The spot imbalance goes down strongly on days 3 and 4 after a recommendation. The cumulative five-day effect is -0.89% of banking equity. The forward imbalance increases strongly on the same days, and the cumulative five-day effect is 1.09% of banking equity, which is slightly stronger than the spot market. The total imbalance (spot plus futures) in the first five days is not significantly different from zero. It is slightly positive because of an initial stronger reaction in the forward market. In column (4) we use the change in the net position of the banking system. The change in the net position is close to the total imbalance in column (3), but it also includes the expiration of previous forward contracts. The cumulative five-day effect is 0.64% of banking equity, which is strongly statistically significant. This suggests that banks let contracts expire so the net position increases more than the net origination of forward contracts, summarized in column (3).

3.4 Cross Currency Basis (CCB)

3.4.1 Event study

So far, we have shown that local banks trade with pension funds in the spot currency market and then hedge their exposures in the forward market. To the extent that the price-elasticity is different across these two markets and spot and forward market trading is not perfectly synchronized, the covered interest rate parity (CIP) violation could arise. In Figure 10 we

perform the same event study as with the spot exchange rate, but now with changes in the CCB at different horizons. We find that the one-month CCB falls by approximately 0.30% by day 10, which is statistically significant. The effect is close to half of the standard deviation of the CCB in our sample. The effects on the three-month and six-month CCBs are economically smaller, but still statistically significant. There is little evidence of a reversal of the CCBs at the horizon of the event study. Thus, the depreciation of the spot Chilean peso exchange rate is not fully offset by changes in the forward prices or the interest rate differential.

Insert Figure 10 here

3.4.2 Time-Series Regressions

In Table 10 we show similar regressions as in Table 7 using the change in the one-month CCB as the dependent variable. The CCB effect is more spread out over the first weeks after the announcement. The cumulative effect is -0.25% over the first week and -0.15% over the second week if we include controls, as summarized in column (2). Hence, violations of the CIP grow larger as the market needs to absorb large portfolio flows from pension funds.

Insert Table 10 here

In columns (3)-(6) we split the change in the CCB into two parts: the change in the forward spread, and the change in interest rates (i.e., the change in the CCB as if the spot and the forward price are always the same), as summarized in equation (2). We find that most of the effect is seen in the forward spread and not in interest rate differentials. The five-day cumulative effect on the forward spread is -0.28% (column (4)), while it is a mere 0.01% on interest rates (column (6(). Hence, as banks buy forward dollars to accommodate the move of investors towards fund A, the forward spread goes down. This is consistent with the idea that local banks provide a bridge between the spot and forward markets,

and therefore collect CIP deviations as an intermediation fee, as also discussed by (Du and Schreger, 2021).

Insert Table 11 here

In Table 11 we perform sample splits to study the heterogeneity of our results. The five-day cumulative effect on the CCB is stronger after buy recommendations (-0.43%) than after sell recommendations (-0.06%). Stronger violations of the CIP after buy emails could be due to the fact that the banking system is systematically short of dollars, as implied by Figure 3, and hence buying pressure from pension funds is harder to accommodate. The CCB effect is also stronger at the end of the quarter (-0.89% vs. -0.24%), which points towards balance-sheet constraints of banks as a driver of the results (Du, Tepper, and Verdelhan, 2018).

3.5 Intermediary Capital

In Table 12 we explore the heterogeneity of our results to banking variables. Previously we explored the relevance of the end of the quarter, which can be related to banking regulations. Now we focus on variables directly measured from the balance sheets of banks. We identify periods where there is a decrease in the risk-weighted equity ratio of the banking system (lagged 30 days). As pointed out by He, Kelly, and Manela (2017), this can be an indicator of the ability and willingness of banks to absorb shocks. We can expect price dislocations to be larger when banks have less capital to intermediate.

Insert Table 12 here

We run a more compact version of our regression by combining the cumulative effect of the first five D_τ indicator variables into a single variable *CUM[1-5]*, and analogously for the next 5 days with *CUM[6-10]*. We then interact these cumulative interaction variables with an indicator for decreases in banking capital. We find that the interaction of the

cumulative dummy for the first five days and the indicator for decreases in banking capital is negative and significant for the CCBs at the one-, three-, and twelve-month horizons. The magnitude is decreasing with the CCB horizon. The interaction with the next five days is also large and significant which speaks of the persistence of the effect when banks are experiencing a decrease in their equity cushion. These results are consistent with the idea that CIP violations are related to the limited capital of the local banking system. The price movements in the forward market are compensation for banks to be intermediaries, which is harder when they have less capital.

4 Conclusions

Taking advantage of large and frequent trading arising from uninformed fund flows in the Chilean pension system, we are able to quantify the impact of noise trading in the foreign exchange market. First, our setting allows us to estimate the price elasticity in foreign exchange markets. Our relatively low price elasticity estimate of 0.81 for Chilean Peso supports the inelastic market hypothesis of Gabaix and Koijen (2021). Second, our unique bank trading and imbalance data shed new insights on the origin of covered interest rate parity (CIP) violations. Local banks in Chile who trade against pension funds in the spot market subsequently hedge their exposures by taking offsetting positions in the forward market. Differential price elasticity and non-synchronicity in trading across the two markets result in deviations from the CIP. Third, supporting the findings in Du, Tepper, and Verdelhan (2018) and Du, Hébert, and Huber (2021), we show that limits to arbitrage can arise from "balance sheet costs." Overall, our unique setting and detailed data offer a rare opportunity to showcase the interaction between noise traders and financial intermediaries in the foreign exchange market.

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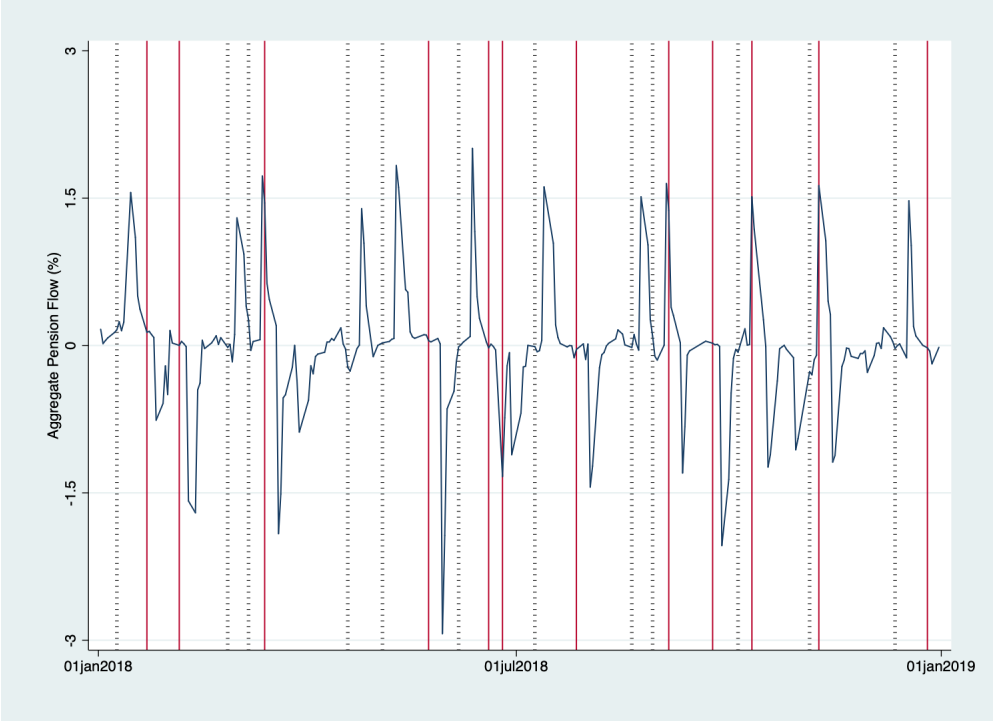
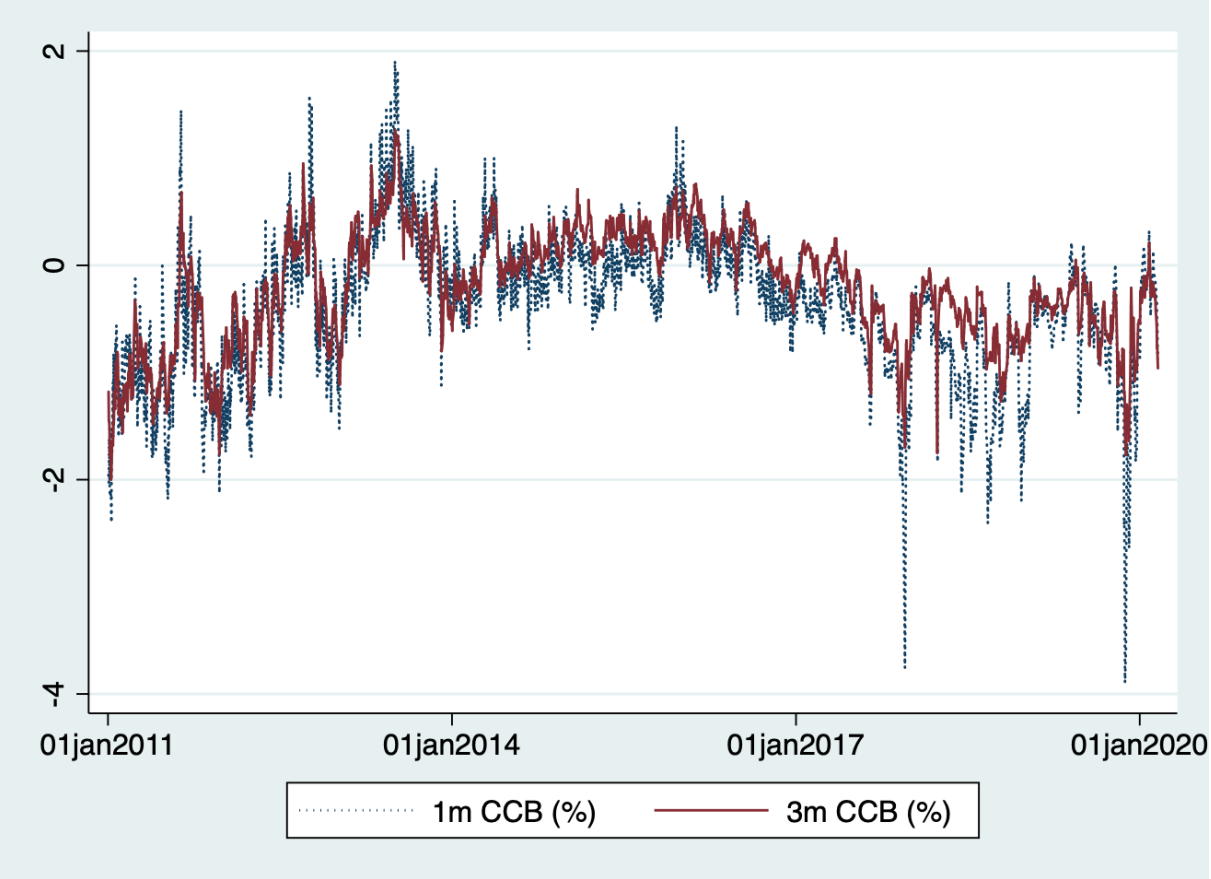
Figure 1: Daily Flows to Pension Fund A (2018)



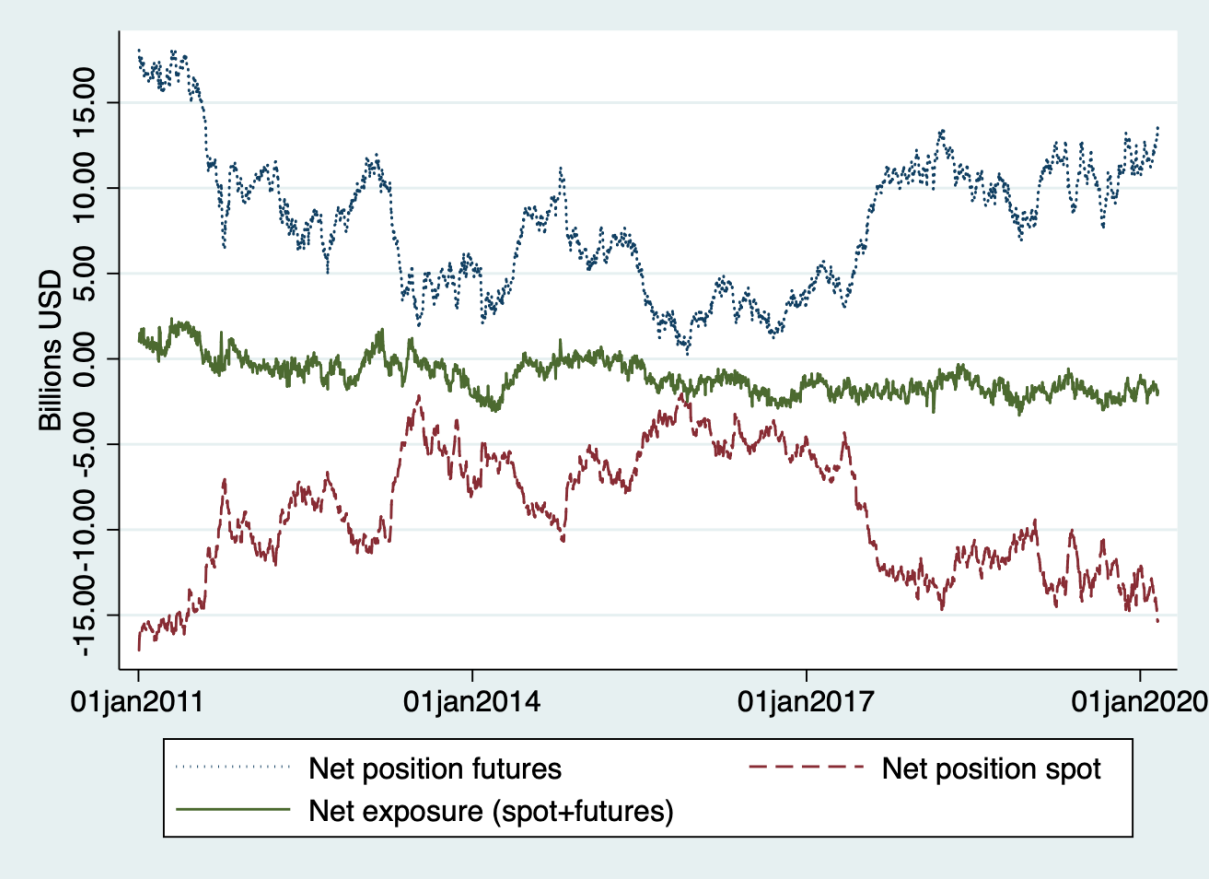
Notes: Daily flows (in percentage terms of AUM) for the aggregate pension fund A in Chile. Dotted (solid) vertical lines mark days of FyF emails that recommend a move towards (away from) fund A. Daily data for 2018.

Figure 2: Cross-Currency Basis



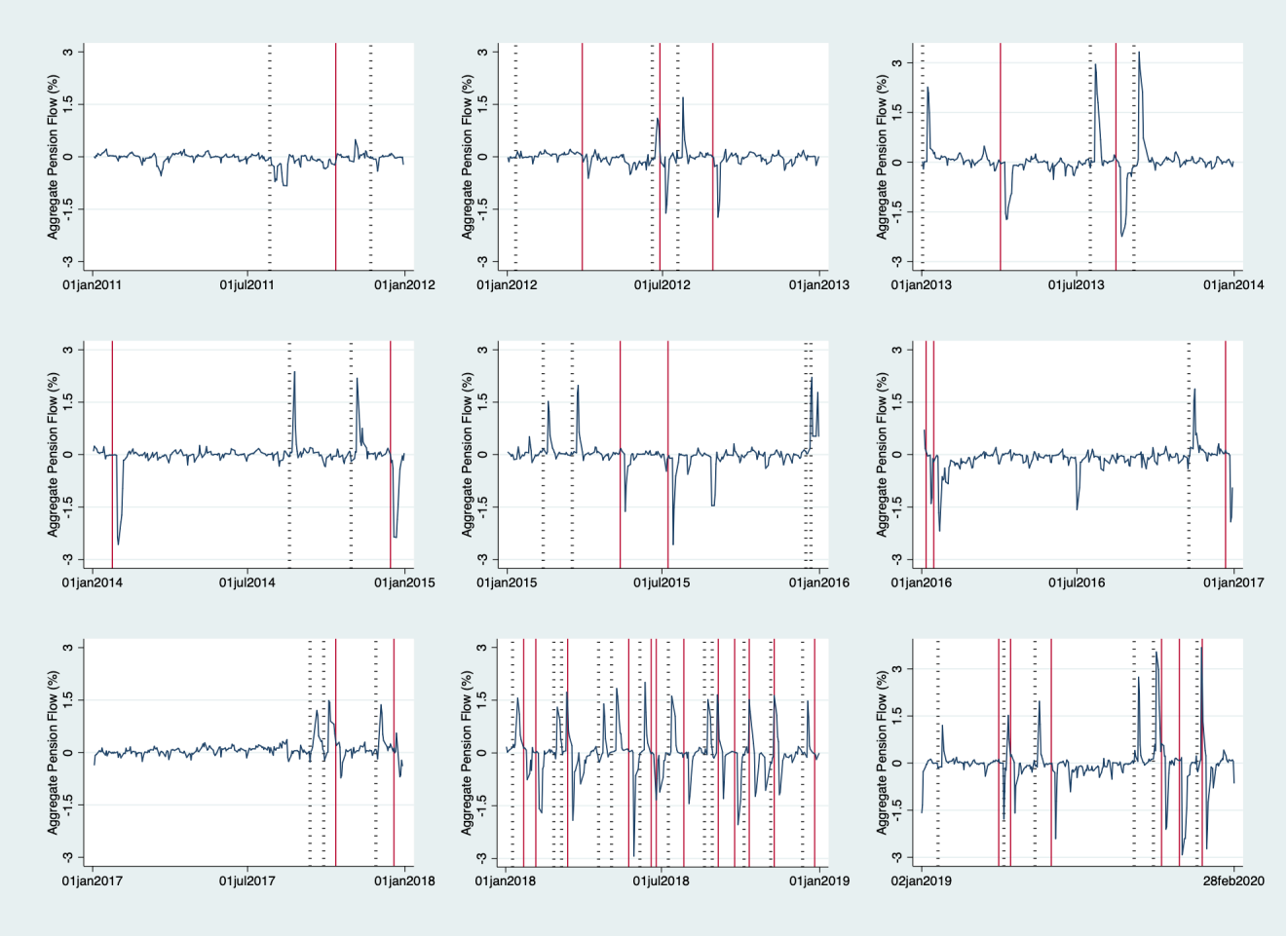
Notes: Data comes from Bloomberg and the Central Bank of Chile.

Figure 3: Banks' Net Position in Forward and Spot Markets



Notes: Figure presents the banks' net position in spot and forward markets as reported by the Central Bank of Chile.

Figure 4: Daily Flows to Pension Fund A



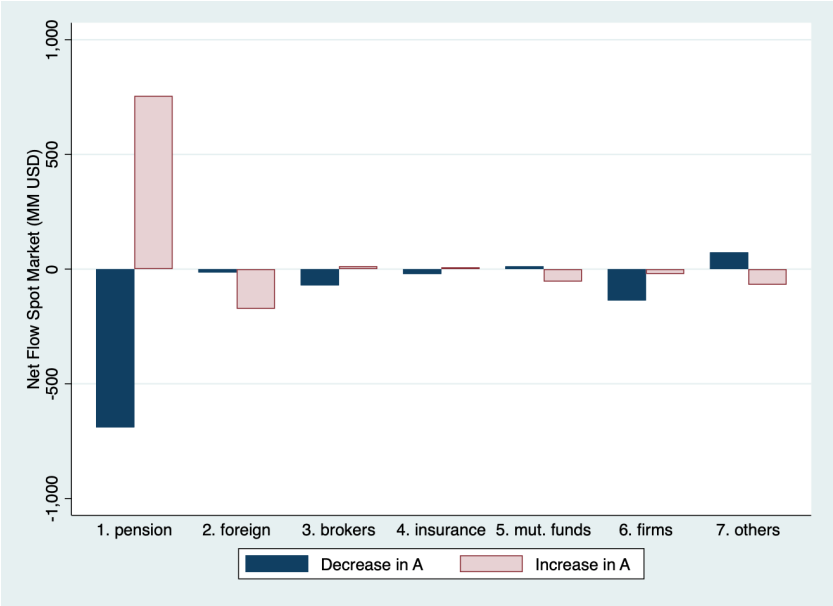
Notes: Daily flows (in percentage terms of AUM) for the aggregate pension fund A in Chile. Dotted (solid) vertical lines mark days of FyF emails that recommend a move towards (away from) fund A. Daily data for the sample that covers the period from January 3, 2011 to February 29, 2020.

Figure 5: Event study - Foreign Exchange Rate

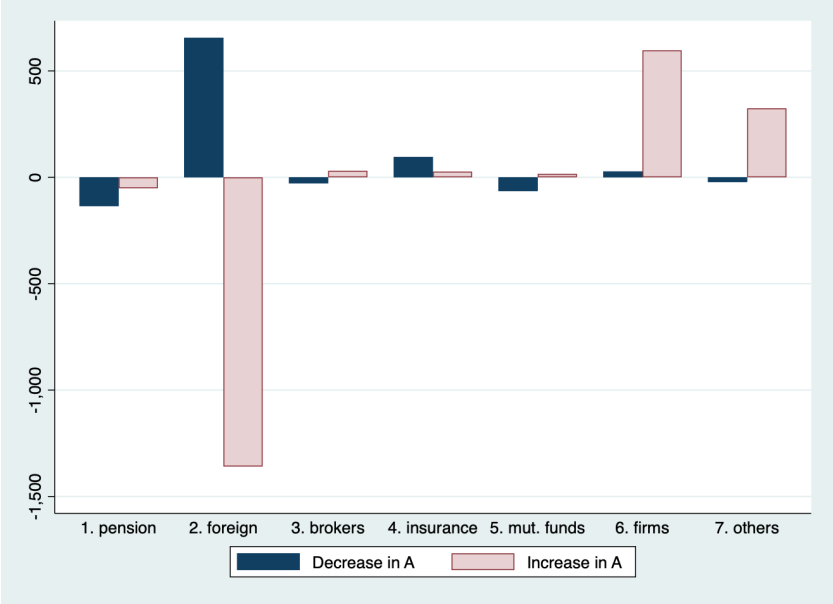
Notes: Event study using all emails 2011-Feb 2020 involving fund A (69). Perspective is towards A, so effects after away-from-A-emails are multiplied by -1. FX data is from Bloomberg. Not adjusting for overlapping events. Confidence bands are at the 95% level.

Figure 6: Monthly Traded Volume in the Spot and Forward Market by Counterparty

(a) Spot Market

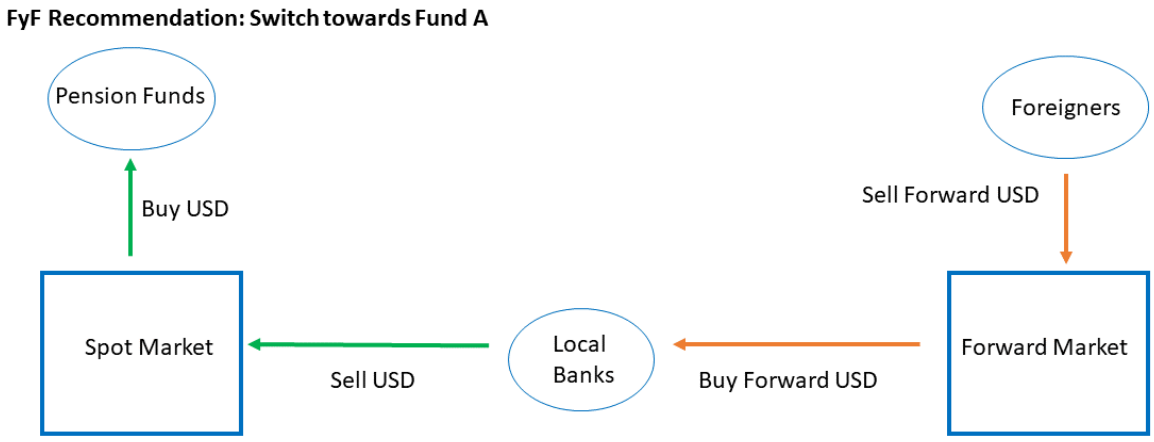


(b) Forward Market



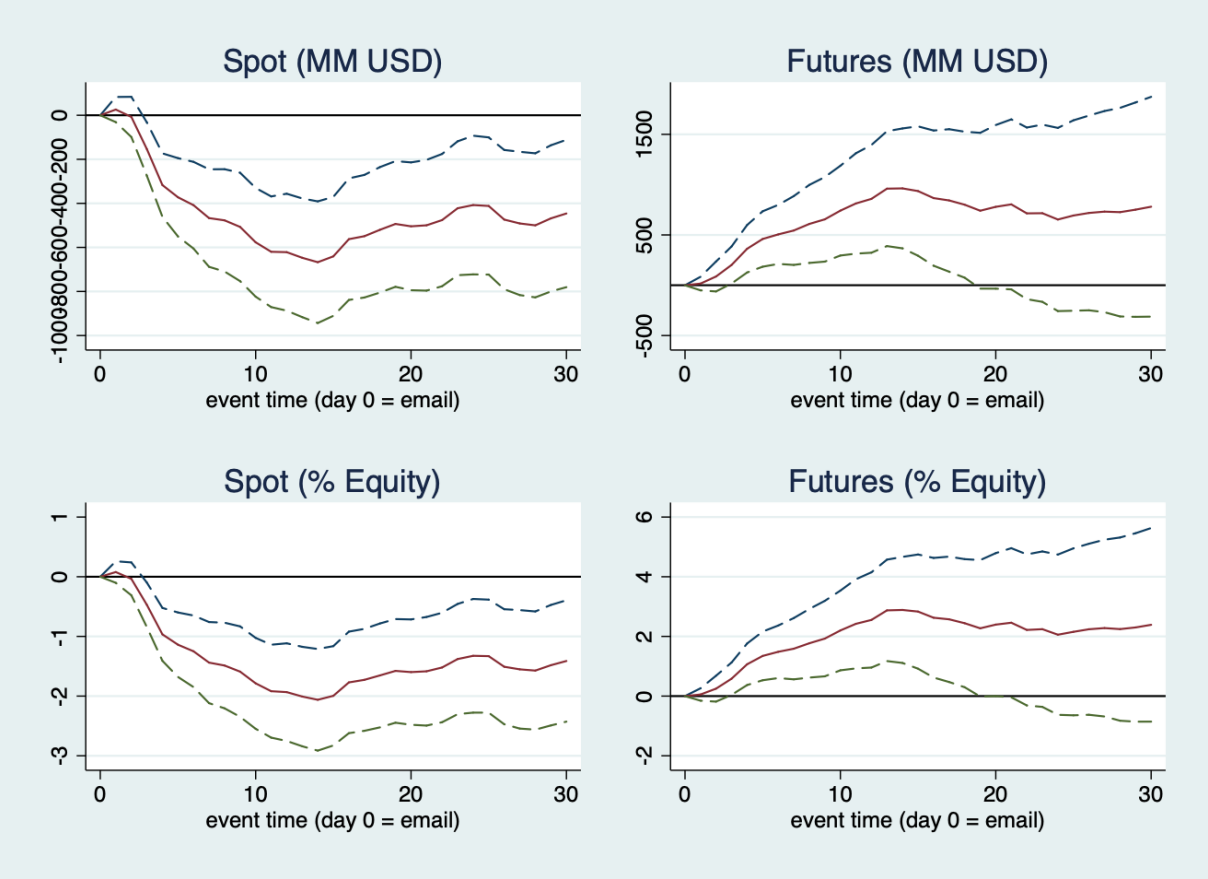
Notes: Figures (a) and (b) shows the monthly average of the difference (buy - sell) by counterparty with the Formal Exchange Market (mainly banks) minus the monthly average of this difference in months with no change in the FyF recommendation of fund A. All values are in millions USD. A positive number represents an increase in the purchases of foreign currencies by each counterparty from banks. Blue (dark-coloured) bars: Months with FyF emails that result in a net decrease in fund A recommendation. Red bars (light-coloured): Months with FyF emails that result in a net increase in fund A recommendation. Others includes households, the government, the central bank and financial institutions not included in the previous categories. The sample covers the period from January 2011 to February 2020.

Figure 7: Flows in the Spot and Forward Markets in Response to FyF Recommendation



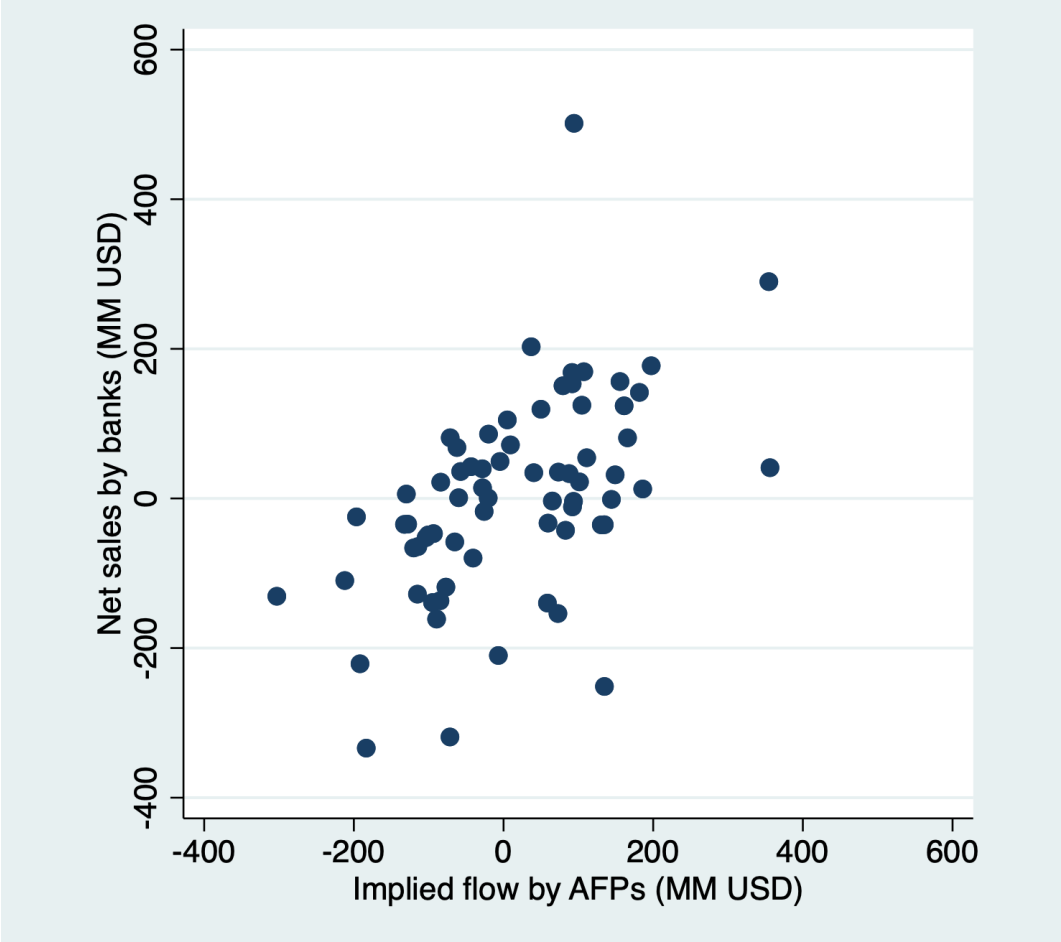
Notes:

Figure 8: Banking Sector Imbalances after FyF Recommendations



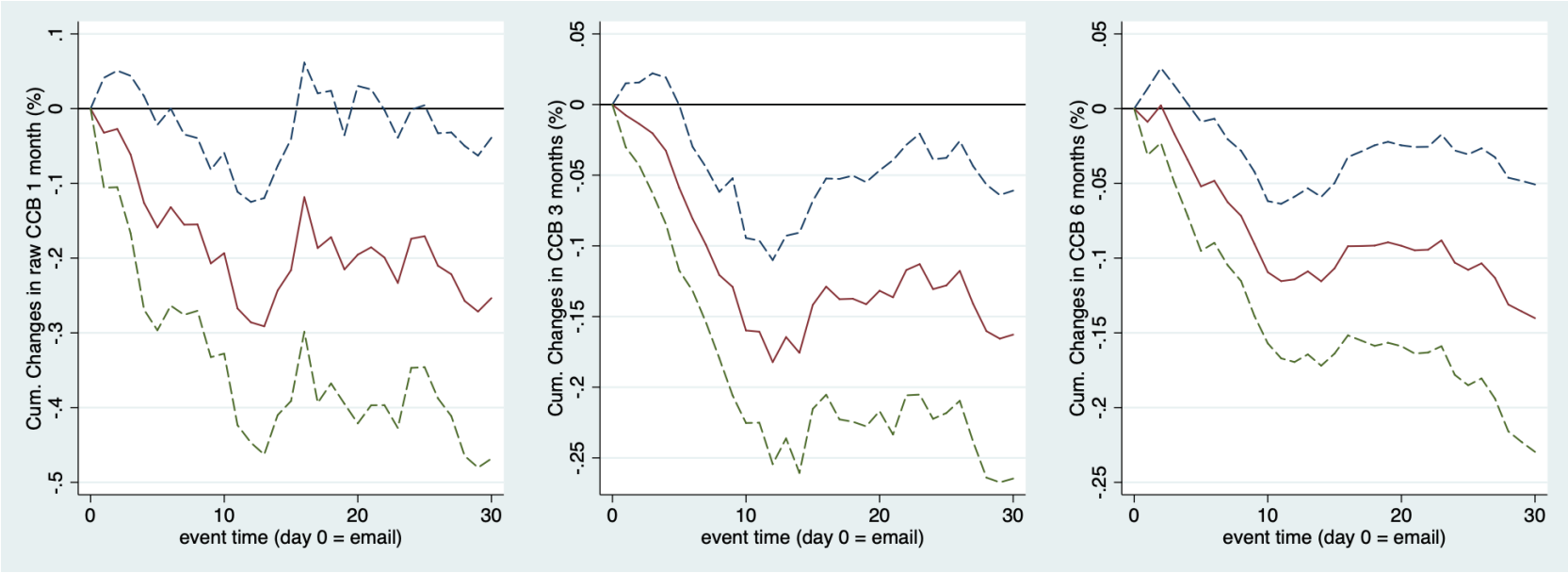
Notes: Event study using all emails 2011-Feb 2020 involving fund A (69). Banking imbalance is defined as Buy minus Sell by the Chilean banking sector in the daily spot market or the forward market. The top row shows results in millions of US dollars, while the bottom row normalizes by bank equity (lagged 30 days). When considering all emails the perspective is towards A, so the effects after away-from-A-emails are multiplied x-1. Data is from the Central Bank of Chile. Confidence bands are at the 95% level.

Figure 9: Daily spot trading by the banking sector and implied flows by AFPs (cumulative 10 days)



Notes: Study using all emails 2011-Feb 2020 involving fund A (69). Each variable corresponds to the sum over the first 10 after an email involving fund A (69 emails). Implied flow is computed as the sum over all funds (A-E) of the multiplication of the daily flows in each fund and the percentage of foreign investment in that fund. A positive number implies that the dollar amount invested by AFPs in foreign assets increased that day. The banking sector spot trading is computed as the difference between the sells and Amounts in million of USD. A positive number implies that banking sector is selling more USD than what it is buying. buys in the spot market. Data is from the Central Bank of Chile and the Chilean regulator of AFP (SAFP). The estimated beta in a linear regression is equal to 0.55.

Figure 10: Event study - Cross Currency Basis



Notes: Event study using all emails 2011-Feb 2020 involving fund A (69). Perspective is towards A, so effects after away-from-A-emails are multiplied by -1. CCB data is from Bloomberg for the one-month CCB, and from the Central Bank of Chile for the 3-month and 6-month CCBs. Not adjusting for overlapping events. Confidence bands are at the 95% level.

Table 1: Summary Statistics

This table shows the summary statistics for the variables used in the analyses. The sample covers the period from January 3, 2011 to February 29, 2020.

	N. of Obs.	Mean	Std. Dev.	p10	Median	p90
Panel A: Prices and rates (daily)						
Spot foreign exchange rate (CLP/USD)	2,041	595.266	90.761	474.050	612.900	700.400
Daily change of the Spot foreign exchange	2,041	0.021	0.622	-0.693	0.012	0.746
1-month Chilean interest rate	2,041	4.133	1.295	2.620	3.850	6.040
1-month Libor interest rate	2,041	0.713	0.765	0.158	0.245	2.087
Spread between the 1-month libor and local rates	2,041	-3.420	1.916	-5.824	-3.550	-0.533
Daily change of the spread between libor and local rates	2,041	0.001	0.051	-0.049	0.000	0.050
Forward spread	2,041	3.045	2.163	-0.230	3.529	5.558
Daily change of the forward spread	2,041	0.003	0.272	-0.286	-0.017	0.329
1-month cross currency basis (CCB)	2,041	-0.362	0.670	-1.265	-0.289	0.362
Daily change of the 1-month CCB	2,041	0.004	0.277	-0.297	-0.020	0.340
Daily change in the price of copper	2,041	-0.022	1.241	-1.481	-0.036	1.435
Panel B: Quantities (daily)						
Spot FX imbalance of banking sector	2,034	0.009	0.737	-0.811	-0.020	0.887
Forward imbalance of banking sector	2,034	-0.232	1.092	-1.460	-0.190	0.962
Net imbalance (sum of spot + forward imbalances)	2,034	-0.224	1.023	-1.338	-0.216	0.876
Daily Flow: Large AFP - Fund A	2,285	-0.004	0.677	-0.256	0.005	0.228
Daily Flow: Large AFP - Fund E	2,284	0.093	1.157	-0.369	0.003	0.689
Daily Flow: Small AFP - Fund A	2,281	0.211	1.388	-0.307	0.056	1.007
Daily Flow: Small AFP - Fund E	2,264	0.156	1.587	-0.529	0.033	1.223
Panel C: Monthly variables						
Chilean inflation	101	0.262	0.282	0.000	0.200	0.600
U.S. inflation	101	0.141	0.200	-0.110	0.180	0.380
Bank capital (over total assets)	101	13.309	0.376	12.807	13.300	13.770
Monthly change in bank capital (over total assets)	100	-0.004	0.194	-0.236	-0.013	0.238
Chilean central bank balance sheet as fraction of GDP	101	16.413	1.742	14.030	16.550	18.000

Table 2: Characteristics of Chilean Pension Funds

This table reports the total asset under management by fund and the percentage of foreign investment (outside Chile) of funds A to E. The percentage invested in international assets correspond to the aggregate portfolio of all AFPs. The summary statistics are computed by fund over all months in our sample using these aggregated percentages. Panel B reports the number of investors in each fund and this number as the percentage of total population in Chile of working age at the close of our sample. The data are collected from administrative records published by the Central Bank, the National Institute of Statistics (INE), and the pension fund regulator (SAFP).

	Fund A	Fund B	Fund C	Fund D	Fund E	Total
Panel A: Pension system characteristics						
AUM average (million US$)	27,587	29,099	65,187	28,289	24,783	174,945
AUM as % of GDP	10.3	10.9	24.4	10.6	9.2	65.4
AUM as % of total AUM in all funds	16	16.7	37.4	16.1	13.8	100
Investors total (thousands)	1,320	4,111	3,776	1,232	554	10,992
Investors as % population of age 18-65y	11.2	34.8	32.1	10.4	4.6	93.2
Investors as % total investors in all funds	12.1	37.4	34.4	11.2	4.9	100
Panel B: Portfolio characteristics						
Foreign investment (% of total AUM)						
Mean	75.2	56.3	40.6	26.0	6.2	41.6
Median	76.5	58.2	42.3	26.9	6.6	41.7
Min	65	44.9	30.3	17.4	1.1	35.4
Max	84.7	67.9	50.5	30.9	11.1	47.8
Foreign equity investment (% of total AUM)						
Mean	61.2	41.2	24.6	12.1	2.3	28.1
Median	61.6	42.4	25.8	13.1	2.4	28.6
Min	54.7	32.9	16.3	6.0	0.2	23.5
Max	66.3	48.1	31.8	16.8	4.4	32.8
Total equity investment (% of total AUM)						
Mean	78.4	58.2	37.9	17.8	3.6	39.8
Median	78.5	58.6	38.6	18.4	4.0	40.3
Min	74.6	53.7	32.9	13.8	1.0	32.9
Max	80.7	60.1	40.5	20.9	5.0	47.8

Table 3: FyF Recommendations

This table shows the list of the 82 portfolio recommendations sent out by FyF since their start in July of 2011 up to the end of February 2020. Fund A is the riskier fund with a higher percentage of funds invested in foreign equities denominated in US dollars. Fund E is the safer fund with a higher percentage of funds invested in local fixed income denominated in Chilean Pesos (CLP). Between funds A and E, the remaining funds B, C, and D gradually reduce risk and the percentage of USD denominated assets. The column labeled "Buying pressure" indicates whether the flows induced by the recommendation results in an increased demand for USD or CLP.

Date	**Recommendation**	**Buying pressure**	**Date**	**Recommendation**	**Buying pressure**
27-Jul-11	100% E	CLP	12-Oct-17	50% A / 50% E	CLP
12-Oct-11	100% A	USD	28-Nov-17	100% A	USD
22-Nov-11	100% E	CLP	19-Dec-17	50% A / 50% E	CLP
11-Jan-12	100% A	USD	9-Jan-18	100% A	USD
29-Mar-12	100% E	CLP	22-Jan-18	50% A / 50% E	CLP
19-Jun-12	100% A	USD	5-Feb-18	100% E	CLP
28-Jun-12	100% E	CLP	26-Feb-18	50% A / 50% E	USD
19-Jul-12	100% A	USD	7-Mar-18	100% A	USD
29-Aug-12	100% E	CLP	14-Mar-18	50% C / 50% E	CLP
2-Jan-13	100% A	USD	23-Mar-18	15% D / 85% E	CLP
3-Apr-13	100% E	CLP	19-Apr-18	50% A / 50% E	USD
17-Jul-13	100% A	USD	4-May-18	100% A	USD
16-Aug-13	100% E	CLP	24-May-18	50% C / 50% E	CLP
6-Sep-13	100% A	USD	6-Jun-18	60% A / 40% E	USD
24-Jan-14	100% E	CLP	19-Jun-18	20% A / 80% E	CLP
6-Mar-14	50% C / 50% E	USD	25-Jun-18	100% E	CLP
1-Aug-14	100% E	CLP	9-Jul-18	50% A / 50% E	USD
19-Aug-14	50% A / 50% E	USD	27-Jul-18	100% E	CLP
30-Oct-14	100% A	USD	20-Aug-18	50% A / 50% E	USD
15-Dec-14	100% E	CLP	29-Aug-18	100% A	USD
12-Feb-15	50% A / 50% E	USD	5-Sep-18	50% A / 50% E	CLP
18-Mar-15	100% A	USD	24-Sep-18	100% E	CLP
13-May-15	50% A / 50% E	CLP	5-Oct-18	50% A / 50% E	USD
8-Jul-15	40% C / 60% E	CLP	11-Oct-18	100% E	CLP
24-Aug-15	100% E	CLP	5-Nov-18	50% A / 50% E	USD
13-Oct-15	50% C / 50% E	USD	9-Nov-18	100% E	CLP
26-Oct-15	100% E	CLP	12-Dec-18	50% A / 50% E	USD
16-Dec-15	50% A / 50% E	USD	26-Dec-18	40% C / 60% E	CLP
22-Dec-15	100% A	USD	18-Jan-19	100% E	CLP
6-Jan-16	50% A / 50% E	CLP	24-Jan-19	50% A / 50% E	USD
15-Jan-16	100% E	CLP	16-Apr-19	100% E	CLP
22-Feb-16	50% C / 50% E	USD	23-Apr-19	50% A / 50% E	USD
29-Apr-16	100% E	CLP	2-May-19	100% E	CLP
6-Sep-16	50% C / 50% E	USD	4-Jun-19	50% A / 50% E	USD
13-Sep-16	100% E	CLP	26-Jun-19	100% E	CLP
9-Nov-16	50% A / 50% E	USD	16-Oct-19	50% A / 50% E	USD
22-Dec-16	100% E	CLP	11-Nov-19	100% A	USD
13-Jul-17	50% C / 50% E	USD	22-Nov-19	50% A / 50% E	CLP
10-Aug-17	100% E	CLP	16-Dec-19	100% E	CLP
12-Sep-17	50% A / 50% E	USD	9-Jan-20	50% A / 50% E	USD
28-Sep-17	100% A	USD	16-Jan-20	100% E	CLP

Table 4: Drivers of FyF recommendations

This table shows regressions examining the factors driving of FyF's recommendations. The independent variable in all columns is the monthly net change in the percentage of fund A recommendation. This variable takes values between 1 and -1. For example, if at the end of the previous month FyF recommended 50% of funds to be invested in Fund A and 50% in Fund E, and at the end of this month the recommendation is to invest is 100%, then this variable takes a value of 0.5. The explanatory variables include the aggregate system past weekly returns of Fund A and Fund E, past weekly changes in the exchange rate and copper prices, the 1-month Chilean interest rate, the 1-month Libor interest rate, and Chilean inflation in the previous month. The sample covers the period from January 3, 2011 to February 29, 2020. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Change Fund A	Change Fund A	Change Fund A	Change Fund A	Change Fund A
Fund A return week -1	0.5959***				0.5246**
	(0.2228)				(0.2416)
Fund A return week -2	-0.3160*				-0.2540
	(0.1891)				(0.2010)
Fund A return week -3	-0.5385**				-0.5385**
	(0.2497)				(0.2495)
Fund A return week -4	-0.2500				-0.2853
	(0.2140)				(0.2053)
Fund E return week -1	-0.9862				-1.1352
	(0.7987)				(0.8312)
Fund E return week -2	0.9405				0.9413
	(0.8889)				(0.9336)
Fund E return week -3	-0.3873				-0.5506
	(0.6674)				(0.7322)
Fund E return week -4	0.1027				-0.0764
	(0.7172)				(0.7641)
FX rate change week -1		-0.2792			-0.0710
		(0.2383)			(0.2669)
FX rate change week -2		-0.1787			-0.3388
		(0.2190)			(0.2447)
FX rate change week -3		-0.3754**			-0.3867*
		(0.1858)			(0.2283)
FX rate change week -4		0.3149			0.3136
		(0.2104)			(0.2824)
Copper price change week -1			0.1747		0.0517
			(0.1225)		(0.1324)
Copper price change week -2			-0.1007		-0.1977*
			(0.1062)		(0.1176)
Copper price change week -3			0.0706		0.0275
			(0.1243)		(0.1352)
Copper price change week -4			-0.1043		0.0426
			(0.1274)		(0.1409)
1-month Chilean interest rate				-0.0001	-0.0024
				(0.0034)	(0.0036)
1-month Libor interest rate				-0.0008	-0.0038
				(0.0049)	(0.0052)
Chilean inflation previous month				-0.0009	-0.0035
				(0.0106)	(0.0110)
Constant	0.0012	0.0008	-0.0003	0.0014	0.0158
	(0.0033)	(0.0028)	(0.0029)	(0.0164)	(0.0172)
Observations	1904	1904	1753	1904	1753
R^2	0.012	0.005	0.003	0.000	0.018

Table 5: FyF Performance

This table shows the average difference in annualized daily returns between following FyF recommendations and passive strategies. The passive strategies correspond to buy-and-hold returns for funds A, C or E. Each column considers returns for different investors according to their starting point in following FyF recommendations. We assume investors request a switch in their pension fund portfolio the same day that the recommendation is issued, and that the switch is implemented at day *t+2* prices according to the Chilean regulation. Return differentials are reported in percentage points. The sample covers the period from August 1st, 2011 (first FyF recommendation) to February 29, 2020. We report the t-statistic for the difference in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

	Following FyF from email #					
	1	10	20	30	40	50
Mean Annualized Return FyF-A (%)	-0.15	-1.90	-1.86	-1.47	1.39	1.52
t-stat	(-0.07)	(-0.87)	(-0.68)	(-0.48)	(0.35)	(0.32)
Mean Annualized Return FyF-C (%)	0.16	-1.15	-0.89	-0.37	1.50	0.63
t-stat	(0.12)	(-0.98)	(-0.62)	(-0.23)	(0.64)	(0.22)
Mean Annualized Return FyF-E (%)	0.86	0.18	0.85	1.49	2.85	1.57
t-stat	(0.56)	(0.12)	(0.46)	(0.71)	(0.82)	(0.39)
N trading days	2136	1781	1294	1030	606	484

Table 6: Daily Pension Fund Flows

This table shows regressions of pension fund (AFP) daily flows in percentage terms onto dummies for the days that follow FyF emails involving fund A. Dummies are equal to 1 (-1) after an email recommending moving to (away from) fund A, and zero otherwise. Flows that are larger than 10% are dropped to exclude events related to government auctions of new clients. Columns 10-12 use a dummy for days with flows that are equal to 5% (±0.1%) as dependent variable. In columns (1) to (6) we show the results for the whole system (sum over all 7 seven AFPs). Columns (7) to (12) present the results for one small pension fund (Modelo). Results for funds A, C, and E are reported separately. Controls include 5 lags of daily flows and fund returns. In the bottom pannel the CUM[1-5] and CUM[6-10] dummies are the cumulative effects over the first five days and days 6 to 10 respectively. The sample covers the period from January 3, 2011 to February 29, 2020. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

VARIABLES	(1) flow	(2) flow	(3) flow	(4) flow	(5) flow	(6) flow	(7) flow	(8) flow	(9) flow	(10) 5% flow	(11) 5% flow	(12) 5% flow
Day 1	-0.05	-0.02**	0.13	0.04*	-0.00	-0.06*	-0.03	0.06	0.23*	0.00	-0.00	0.00
	(0.05)	(0.01)	(0.08)	(0.02)	(0.01)	(0.03)	(0.10)	(0.09)	(0.13)	(0.00)	(0.00)	(0.00)
Day 2	0.01	0.00	0.03	0.02	0.01	-0.05	-0.11	-0.04	-0.24*	0.00	-0.00	0.00
	(0.02)	(0.01)	(0.04)	(0.02)	(0.01)	(0.04)	(0.11)	(0.10)	(0.14)	(0.00)	(0.00)	(0.00)
Day 3	0.03	0.00	-0.01	-0.01	0.00	-0.01	0.04	0.03	-0.08	0.00	-0.00	-0.01
	(0.02)	(0.01)	(0.04)	(0.02)	(0.01)	(0.03)	(0.09)	(0.08)	(0.12)	(0.00)	(0.00)	(0.01)
Day 4	1.69***	0.03	-2.64***	1.65***	0.02	-2.62***	3.89***	-0.13	-3.89***	0.19***	-0.00	-0.31***
	(0.09)	(0.03)	(0.15)	(0.09)	(0.03)	(0.14)	(0.16)	(0.16)	(0.25)	(0.05)	(0.00)	(0.05)
Day 5	1.39***	0.01	-2.25***	0.25***	-0.00	-0.20*	1.86***	-0.24**	-2.30***	0.02	-0.00	-0.01
	(0.08)	(0.02)	(0.16)	(0.07)	(0.01)	(0.12)	(0.20)	(0.10)	(0.22)	(0.02)	(0.00)	(0.02)
Day 6	0.65***	0.03**	-1.11***	-0.18***	0.02**	0.39***	0.78***	0.15	-1.03***	0.01	0.00	-0.03
	(0.08)	(0.01)	(0.16)	(0.06)	(0.01)	(0.10)	(0.20)	(0.13)	(0.25)	(0.01)	(0.00)	(0.02)
Day 7	0.41***	0.02**	-0.70***	0.03	0.01	0.02	0.55***	-0.06	-0.79***	0.00	0.00	-0.03**
	(0.06)	(0.01)	(0.12)	(0.04)	(0.01)	(0.07)	(0.17)	(0.13)	(0.23)	(0.00)	(0.00)	(0.02)
Day 8	0.17***	0.01	-0.34***	-0.05	-0.00	0.07	0.28*	-0.05	-0.26	0.00	-0.00	-0.01
	(0.04)	(0.01)	(0.10)	(0.04)	(0.01)	(0.06)	(0.16)	(0.08)	(0.17)	(0.00)	(0.00)	(0.01)
Day 9	0.09***	0.01	-0.18***	-0.02	0.01	0.07	0.13	0.15	0.05	-0.00	-0.00	-0.03**
	(0.03)	(0.01)	(0.07)	(0.04)	(0.01)	(0.05)	(0.12)	(0.13)	(0.20)	(0.00)	(0.00)	(0.01)
Day 10	0.06**	0.01	-0.14**	-0.02	0.01	0.02	0.06	0.05	0.01	-0.00	0.00	-0.02**
	(0.02)	(0.01)	(0.06)	(0.03)	(0.01)	(0.05)	(0.11)	(0.06)	(0.12)	(0.00)	(0.00)	(0.01)
AFP	ALL	ALL	ALL	ALL	ALL	ALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL
FUND	A	C	E	A	C	E	A	C	E	A	C	E
Controls	no	no	no	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	2286	2286	2286	2281	2281	2281	2257	2248	2173	2257	2248	2173
R-squared	0.680	0.005	0.515	0.832	0.296	0.784	0.614	0.059	0.519	0.161	0.007	0.238
Cumulative evidence												
CUM [1-5]	3.01***	0.02	-4.65***	2.08***	0.03	-3.20***	5.25***	-0.31	-5.79***	0.22***	-0.00	-0.34***
	(0.25)	(0.04)	(0.41)	(0.22)	(0.04)	(0.35)	(0.53)	(0.25)	(0.58)	(0.06)	(0.00)	(0.07)
CUM [6-10]	1.47***	0.08***	-2.63***	-0.35**	0.04*	0.68***	1.41***	0.25	-1.56***	0.01	0.00	-0.13**
	(0.14)	(0.02)	(0.28)	(0.15)	(0.02)	(0.19)	(0.44)	(0.26)	(0.55)	(0.02)	(0.00)	(0.05)

Table 7: Time-Series Regressions - Foreign Exchange Rates

This table shows regressions for the daily depreciation of the spot foreign exchange rate (S). Independent variables are dummies for the days that follow FyF emails involving fund A. Dummies are equal to 1 (-1) after an email recommending moving to (away from) fund A, and zero otherwise. Dependent variables are expressed in percentage terms, so a coefficient of 1 implies a change of 1%. Macroeconomic controls include the daily change in the price of copper, and 30-day lags of Chilean and U.S. inflation, 3-month Chilean and Libor (in USD) interest rates, and the size of the Chilean central bank balance sheet as fraction of GDP. Additionally columns 2, 5, and 6 include 5 lags of the dependent variable. The CUM[1-5] and CUM[6-10] dummies are the cumulative effects over the first five days and days 6 to 10 respectively. The sample covers the period from January 3, 2011 to February 29, 2020 and is restricted for the availability of a one-month futures price in Bloomberg. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

VARIABLES	(1) ΔFX	(2) ΔFX	(3) ΔFX	(4) ΔFX	(5) ΔFX	(6) ΔFX
Day 1	0.2212**	0.2427***	0.2263**	0.2488***	0.2362***	0.2512***
	(0.0867)	(0.0814)	(0.0918)	(0.0859)	(0.0892)	(0.0854)
Day 2	0.2374***	0.2277***	0.2210***	0.2084**	0.2056**	0.2074**
	(0.0788)	(0.0833)	(0.0852)	(0.0858)	(0.0843)	(0.0853)
Day 3	-0.1473*	-0.1351	-0.1157	-0.1009	-0.1375	-0.1115
	(0.0818)	(0.0837)	(0.0894)	(0.0867)	(0.0908)	(0.0884)
Day 4	0.0199	0.0337	-0.0042	0.0065	-0.0027	0.0043
	(0.0853)	(0.0812)	(0.0983)	(0.0909)	(0.0953)	(0.0875)
Day 5	0.0344	0.0663	0.0265	0.0550	0.0429	0.0743
	(0.0902)	(0.0882)	(0.1019)	(0.0980)	(0.1011)	(0.0969)
Sample	All	All	F 1m available	F 1m available	F 1m available	F 1m available
Macro Controls	no	yes	no	yes	no	yes
Lag Controls	no	yes	no	no	yes	yes
Observations	2277	2181	2041	2041	2041	2041
R-squared	0.014	0.139	0.013	0.132	0.023	0.136
Cumulative evidence						
CUM [1-5]	0.3684*	0.4468**	0.3738*	0.4360**	0.3638*	0.4434**
	(0.1926)	(0.1885)	(0.2114)	(0.2022)	(0.2079)	(0.1994)
CUM [6-10]	0.2394	0.2481	0.3181	0.2859	0.3018	0.2952
	(0.1958)	(0.1894)	(0.2126)	(0.1995)	(0.2146)	(0.2010)

Table 8: Sample Splits with Panel Regressions

This table shows regressions for the daily depreciation of the spot foreign exchange rate (S). Independent variables are dummies for the days that follow FyF emails involving fund A. Dummies for each day are equal to 1 (-1) after an email recommending moving to (away from) fund A, and zero otherwise. Dummies for each of the first ten days after an email are included, but we omit the individual dummies for days 6–10. The CUM[1-5] dummy is the cumulative effect over the five days. The CUM[6-10] dummy is the cumulative effect over days 6 to 10. Dependent variables are expressed in percentage terms, so a coefficient of 1 implies a change of 1% (annualized in the case of carry or CCB). Control variables include the daily change in the price of copper, 30-day lags of Chilean and U.S. inflation, 3-month Chilean and Libor (in USD) interest rates, the size of the Chilean central bank balance sheet as fraction of GDP, and 5 lags of the dependent variable. The sample is restricted for the availability of a one-month futures price in Bloomberg. Buy (sell) emails refer to emails that recommend moving towards (away from) fund A. The end of quarter sample includes trading days after the 24th of the month in March, June, September, and December. The free float sample excludes periods of central bank intervention in the foreign exchange market (the year 2011 and from November 29, 2019 up to the end of our sample on February 29, 2020). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sample	Buy Emails	Sell Emails	2011-15	2016-20	Q-end	not Q-end	Free Float
Day 1	0.4062***	0.0832	0.1670	0.2972**	0.5158**	0.2309**	0.2387***
	(0.1378)	(0.0942)	(0.1136)	(0.1175)	(0.2455)	(0.0922)	(0.0898)
Day 2	0.1388	0.2705**	0.1906	0.2182*	0.3389	0.2053**	0.2204**
	(0.1299)	(0.1103)	(0.1178)	(0.1217)	(0.3552)	(0.0891)	(0.0927)
Day 3	-0.0324	-0.1996	-0.1672*	-0.0766	-0.0530	-0.1156	-0.1167
	(0.1257)	(0.1257)	(0.0995)	(0.1296)	(0.4590)	(0.0908)	(0.0962)
Day 4	-0.0152	0.0162	0.1323	-0.0830	0.3545	-0.0094	-0.0277
	(0.1536)	(0.0815)	(0.0893)	(0.1268)	(0.4674)	(0.0895)	(0.0938)
Day 5	-0.1317	0.2666*	-0.1079	0.1925	0.0043	0.0880	0.0376
	(0.1137)	(0.1476)	(0.1122)	(0.1400)	(0.2435)	(0.1021)	(0.0961)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1775	1785	1189	852	118	1923	1749
R-squared	0.142	0.139	0.186	0.102	0.211	0.140	0.118
Cumulative evidence							
CUM [1-5]	0.4125	0.4308	0.2283	0.5574*	1.4916*	0.4039*	0.3754*
	(0.3123)	(0.2718)	(0.2516)	(0.2876)	(0.8927)	(0.2086)	(0.2093)
CUM [6-10]	0.5229*	0.0392	0.0770	0.5119*	1.6766**	0.2404	0.2742
	(0.2917)	(0.2935)	(0.2761)	(0.2873)	(0.7891)	(0.2086)	(0.2034)

Table 9: Panel Regressions - Daily Banking Flows and Imbalances

This table shows regressions for daily banking sector flows and imbalances. Net flows in the spot (futures) market in column 1 (2) are defined as the amount bought minus the amount sold to third parties, divided by the 30-day lagged equity of the banking sector. Spot+Futures in column (3) corresponds to the the sum of the net flows in the spot and futures market. In column (4) we use the daily change in banks' net exposure (spot position + futures position). The main independent variable are dummies for the five days that follow FyF emails involving fund A. The CUM[1-5] dummy is the cumulative effect over the five days. The CUM[6-10] dummy is the cumulative effect over days 6 to 10. These dummies are positive (negative) after an email recommending moving to (away from) fund A, and zero otherwise. Control variables include the daily change in the price of copper, 5 lags of the dependent variable, 30-day lags of Chilean and U.S. inflation, 3-month Chilean and Libor (in USD) interest rates, and the size of the Chilean central bank balance sheet as fraction of GDP. The sample covers the period from January 3, 2011 to February 29, 2020 and is restricted for the availability of a one-month futures price in Bloomberg. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

VARIABLES	(1) Spot	(2) Futures	(3) Spot+Futures	(4) $\Delta NetPosition$
Day 1	0.1206	0.0260	0.1505	0.2008*
	(0.0977)	(0.1081)	(0.0928)	(0.1028)
Day 2	-0.1154	0.1991	0.1161	0.0907
	(0.0925)	(0.1707)	(0.1769)	(0.1045)
Day 3	-0.3899***	0.2610**	-0.1114	0.1737
	(0.1159)	(0.1282)	(0.1441)	(0.1058)
Day 4	-0.4868***	0.4530***	-0.0609	0.0878
	(0.1057)	(0.1623)	(0.1298)	(0.1136)
Day 5	-0.0326	0.1591	0.0831	0.0768
	(0.1233)	(0.1494)	(0.1396)	(0.1108)
controls	Yes	Yes	Yes	Yes
Observations	2029	2029	2029	2028
R-squared	0.092	0.073	0.034	0.139
Cumulative evidence				
CUM [1-5]	-0.8908***	1.0853***	0.1848	0.6395***
	(0.2456)	(0.3264)	(0.3122)	(0.2426)
CUM [6-10]	-0.5462**	0.5073	0.0190	-0.0707
	(0.2283)	(0.3750)	(0.3776)	(0.3028)

Table 10: Time-Series Regressions - Cross Currency Basis

This table shows regressions for the change of the 1-month cross-currency basis (CCB), change of the forward spread (=(F-S)/F), and change of the spread between the 1-month libor rate and the local rate($Rates$). Independent variables are dummies for the days that follow FyF emails involving fund A. Dummies are equal to 1 (-1) after an email recommending moving to (away from) fund A, and zero otherwise. Dependent variables are expressed in percentage terms, so a coefficient of 1 implies a change of 1% annualized. Macroeconomic controls include the daily change in the price of copper, and 30-day lags of Chilean and U.S. inflation, 3-month Chilean and Libor (in USD) interest rates, and the size of the Chilean central bank balance sheet as fraction of GDP. Additionally columns 2, 5, and 6 include 5 lags of the dependent variable. The CUM[1-5] and CUM[6-10] dummies are the cumulative effects over the first five days and days 6 to 10 respectively. The sample covers the period from January 3, 2011 to February 29, 2020 and is restricted for the availability of a one-month futures price in Bloomberg. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

VARIABLES	(1) $\Delta CCB1m$	(2) $\Delta CCB1m$	(3) $\Delta FwdSpread$	(4) $\Delta FwdSpread$	(5) $\Delta Rates$	(6) $\Delta Rates$
Day 1	-0.0351	-0.0582	-0.0430	-0.0705**	0.0080	0.0077
	(0.0397)	(0.0376)	(0.0382)	(0.0355)	(0.0050)	(0.0050)
Day 2	0.0068	-0.0201	-0.0029	-0.0338	0.0097	0.0096
	(0.0294)	(0.0277)	(0.0297)	(0.0274)	(0.0065)	(0.0065)
Day 3	-0.0353	-0.0372	-0.0304	-0.0357	-0.0049	-0.0041
	(0.0318)	(0.0354)	(0.0296)	(0.0334)	(0.0065)	(0.0069)
Day 4	-0.0868**	-0.0922**	-0.0890**	-0.0963**	0.0025	0.0021
	(0.0394)	(0.0427)	(0.0377)	(0.0398)	(0.0110)	(0.0111)
Day 5	-0.0260	-0.0480*	-0.0257	-0.0472*	-0.0001	-0.0013
	(0.0293)	(0.0289)	(0.0285)	(0.0285)	(0.0088)	(0.0089)
Sample	F 1m available	F 1m available	F 1m available	F 1m available	F 1m available	F 1m available
controls	No	Yes	No	Yes	No	Yes
Observations	2041	2041	2041	2041	2041	2041
R-squared	0.007	0.108	0.008	0.124	0.004	0.019
Cumulative evidence						
CUM [1-5]	-0.1742**	-0.2543***	-0.1896**	-0.2835***	0.0160	0.0149
	(0.0773)	(0.0776)	(0.0746)	(0.0745)	(0.0172)	(0.0177)
CUM [6-10]	-0.0907	-0.1476*	-0.0770	-0.1295	-0.0135	-0.0129
	(0.0896)	(0.0892)	(0.0853)	(0.0852)	(0.0176)	(0.0174)
controls	No	Yes	No	Yes	No	Yes

Table 11: Sample Splits with Panel Regressions - Cross Currency Basis

This table shows regressions for the changes of the 1-month cross-currency basis (CCB). Independent variables are dummies for the days that follow FyF emails involving fund A. Dummies for each day are equal to 1 (-1) after an email recommending moving to (away from) fund A, and zero otherwise. Dummies for each of the first ten days after an email are included, but we omit the individual dummies for days 6–10. The CUM[1-5] dummy is the cumulative effect over the five days. The CUM[6-10] dummy is the cumulative effect over days 6 to 10. Dependent variables are expressed in percentage terms, so a coefficient of 1 implies a change of 1% (annualized in the case of carry or CCB). Control variables include the daily change in the price of copper, 30-day lags of Chilean and U.S. inflation, 3-month Chilean and Libor (in USD) interest rates, the size of the Chilean central bank balance sheet as fraction of GDP, and 5 lags of the dependent variableosea, justo . The sample is restricted for the availability of a one-month futures price in Bloomberg. Buy (sell) emails refer to emails that recommend moving towards (away from) fund A. The end of quarter sample includes trading days after the 24th of the month in March, June, September, and December. The free float sample excludes periods of central bank intervention in the foreign exchange market (the year 2011 and from November 29, 2019 up to the end of our sample on February 29, 2020). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sample	Buy Emails	Sell Emails	2011-15	2016-20	Q-end	not Q-end	Free Float
Day 1	-0.0639	-0.0508	0.0266	-0.1025**	-0.2106***	-0.0536	-0.0642
	(0.0641)	(0.0384)	(0.0512)	(0.0472)	(0.0778)	(0.0410)	(0.0405)
Day 2	-0.0747*	0.0413	-0.0435	0.0013	-0.3241**	-0.0095	-0.0223
	(0.0387)	(0.0377)	(0.0525)	(0.0295)	(0.1350)	(0.0284)	(0.0297)
Day 3	-0.0786	0.0140	-0.0107	-0.0498	0.0227	-0.0435	-0.0659*
	(0.0536)	(0.0461)	(0.0578)	(0.0426)	(0.0980)	(0.0361)	(0.0359)
Day 4	-0.1424**	-0.0335	-0.0287	-0.1257**	-0.1967**	-0.0875*	-0.1030**
	(0.0724)	(0.0431)	(0.0604)	(0.0509)	(0.0874)	(0.0451)	(0.0455)
Day 5	-0.0648	-0.0300	-0.1074**	0.0059	-0.0367	-0.0473	-0.0533
	(0.0485)	(0.0352)	(0.0465)	(0.0364)	(0.1800)	(0.0288)	(0.0327)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1775	1785	1189	852	118	1923	1749
R-squared	0.119	0.134	0.171	0.062	0.263	0.107	0.129
Cumulative evidence							
CUM [1-5]	-0.4250***	-0.0578	-0.1594	-0.2808***	-0.8853***	-0.2390***	-0.3087***
	(0.1296)	(0.0962)	(0.1222)	(0.0968)	(0.2956)	(0.0808)	(0.0827)
CUM [6-10]	0.1646	-0.4078***	-0.1476	-0.1330	-0.0678	-0.1484	-0.0529
	(0.1342)	(0.1234)	(0.1304)	(0.1103)	(0.3561)	(0.0941)	(0.0858)

Table 12: Panel Regressions with Banking Interactions

This table shows regressions for the changes of the cross-currency basis (CCB) at one, three, six or twelve months. The main independent variables are a dummy for the five days that follow FyF emails involving fund A (CUM [1-5]) and a dummy for the cumulative effect over days 6 to 10 (CUM[6-10]). We divide these dummies by 5, so the coefficient is the cumulative effect over the five days. The dummy is positive (negative) after an email recommending moving to (away from) fund A, and zero otherwise. These dummies are interacted with indicators for days when the banking capital decreased in the previous month ($DecreaseBankCapital$). Dependent variables are expressed in percentage terms, so a coefficient of 1 implies a change of 1% (annualized in the case of CCBs) Control variables include the corresponding dummies for the end of quarter or increases in bank capital, daily change in the price of copper, 5 lags of the dependent variable, and 30-day lags of Chilean and U.S. inflation, 3-month Chilean and U.S. interest rates, and the size of the Chilean central bank balance sheet as fraction of GDP. CCB data is from the Central Bank of Chile, unless it says "raw" where it comes from Bloomberg. The sample covers the period from January 3, 2011 to February 29, 2020 and is restricted for the availability of a one-month futures price in Bloomberg. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

VARIABLES	(1) $\Delta CCB1m$	(2) $\Delta CCB3m$	(3) $\Delta CCB6m$	(4) $\Delta CCB12m$
CUM [1-5]	-0.0611	-0.0126	-0.0099	0.0199
	(0.0932)	(0.0417)	(0.0422)	(0.0274)
CUM [6-10]	0.0151	-0.0525	-0.0435	-0.0235
	(0.0987)	(0.0483)	(0.0316)	(0.0286)
CUM [1-5] * Decrease in Bank Capital	-0.3279**	-0.1046*	-0.0823	-0.0757**
	(0.1493)	(0.0591)	(0.0539)	(0.0373)
CUM [6-10] * Decrease in Bank Capital	-0.3018*	-0.1491**	-0.0495	-0.0373
	(0.1734)	(0.0693)	(0.0509)	(0.0392)
Decrease in Bank Capital	0.0065	0.0014	0.0013	-0.0011
	(0.0117)	(0.0049)	(0.0038)	(0.0033)
Controls	Yes	Yes	Yes	Yes
Observations	2004	2004	2004	2004
R-squared	0.109	0.027	0.031	0.031