Pension Fund Flows, Exchange Rates, and Covered Interest Rate Parity

Felipe Aldunate ¹ Zhi Da ² Borja Larrain ³ Clemens Sialm ⁴

¹Universidad de los Andes ²University of Notre Dame ³Pontificia Universidad Católica de Chile ⁴University of Texas at Austin

January 2024
Conventional wisdom is that currency markets are highly liquid and immune to non-fundamental flows.
Conventional wisdom is that currency markets are highly liquid and immune to non-fundamental flows.

In a world with imperfect financial markets, non-fundamental flows can have an impact on exchange rates and no-arbitrage relationships, such as the covered interest rate parity (Maggiori, 2022).
Motivation

- Conventional wisdom is that currency markets are highly liquid and immune to non-fundamental flows.

- In a world with imperfect financial markets, non-fundamental flows can have an impact on exchange rates and no-arbitrage relationships, such as the covered interest rate parity (Maggiori, 2022).

- Identification challenge: disentangling non-fundamental flows from fundamental/informed flows.
Conventional wisdom is that currency markets are highly liquid and immune to non-fundamental flows.

In a world with imperfect financial markets, non-fundamental flows can have an impact on exchange rates and no-arbitrage relationships, such as the **covered interest rate parity** (Maggiori, 2022).

Identification challenge: disentangling non-fundamental flows from fundamental/informed flows.

Role of intermediaries in accommodating non-fundamental flows.
This Paper

- Setup

Motivation
Roadmap
Chilean Pension Funds and FyF
Spot FX
Bank Hedging
CIP
Conclusions
Setup

- Defined-contribution pension system in Chile.
This Paper

- **Setup**
  - Defined-contribution pension system in Chile.
  - More than 10 million individual accounts; USD 175 billion AUM (65% GDP).
**Setup**

- Defined-contribution pension system in Chile.
- More than 10 million individual accounts; USD 175 billion AUM (65% GDP).
- Investors can choose between 5 types of funds with different risk profiles.
This Paper

- **Setup**
  - Defined-contribution pension system in Chile.
  - More than 10 million individual accounts; USD 175 billion AUM (65% GDP).
  - Investors can choose between 5 types of funds with different risk profiles.

- **Non-fundamental Flow**
This Paper

- **Setup**
  - Defined-contribution pension system in Chile.
  - More than 10 million individual accounts; USD 175 billion AUM (65% GDP).
  - Investors can choose between 5 types of funds with different risk profiles.

- **Non-fundamental Flow**
  - Transfers between funds recommended by advisor “Felices y Forrados” (FyF).
This Paper

**Setup**
- Defined-contribution pension system in Chile.
- More than 10 million individual accounts; USD 175 billion AUM (65% GDP).
- Investors can choose between 5 types of funds with different risk profiles.

**Non-fundamental Flow**
- Transfers between funds recommended by advisor “Felices y Forrados” (FyF).
- FyF caters to market timers.
This Paper

- **Setup**
  - Defined-contribution pension system in Chile.
  - More than 10 million individual accounts; USD 175 billion AUM (65% GDP).
  - Investors can choose between 5 types of funds with different risk profiles.

- **Non-fundamental Flow**
  - Transfers between funds recommended by advisor “Felices y Forrados” (FyF).
  - FyF caters to market timers.
  - Recommendations are unrelated to FX fundamentals.
This Paper

- **Setup**
  - Defined-contribution pension system in Chile.
  - More than 10 million individual accounts; USD 175 billion AUM (65% GDP).
  - Investors can choose between 5 types of funds with different risk profiles.

- **Non-fundamental Flow**
  - Transfers between funds recommended by advisor “Felices y Forrados” (FyF).
  - FyF caters to market timers.
  - Recommendations are unrelated to FX fundamentals.

- **Results**
This Paper

- **Setup**
  - Defined-contribution pension system in Chile.
  - More than 10 million individual accounts; USD 175 billion AUM (65% GDP).
  - Investors can choose between 5 types of funds with different risk profiles.

- **Non-fundamental Flow**
  - Transfers between funds recommended by advisor “Felices y Forrados” (FyF).
  - FyF caters to market timers.
  - Recommendations are unrelated to FX fundamentals.

- **Results**
  - Chilean Peso depreciates by 0.59% as pension funds buy USD 850 million.
Setup

- Defined-contribution pension system in Chile.
- More than 10 million individual accounts; USD 175 billion AUM (65% GDP).
- Investors can choose between 5 types of funds with different risk profiles.

Non-fundamental Flow

- Transfers between funds recommended by advisor “Felices y Forrados” (FyF).
- FyF caters to market timers.
- Recommendations are unrelated to FX fundamentals.

Results

- Chilean Peso depreciates by 0.59% as pension funds buy USD 850 million.
- Banks’ hedging demand transmits the shock to the forward market.
This Paper

- **Setup**
  - Defined-contribution pension system in Chile.
  - More than 10 million individual accounts; USD 175 billion AUM (65% GDP).
  - Investors can choose between 5 types of funds with different risk profiles.

- **Non-fundamental Flow**
  - Transfers between funds recommended by advisor “Felices y Forrados” (FyF).
  - FyF caters to market timers.
  - Recommendations are unrelated to FX fundamentals.

- **Results**
  - Chilean Peso depreciates by 0.59% as pension funds buy USD 850 million.
  - Banks’ hedging demand transmits the shock to the forward market.
  - Cross-currency basis falls by 25 bp (from an average of $-36$ bp).
Roadmap

1. Chilean Pension Funds and FyF
2. Spot FX Market
3. Bank Hedging
4. Covered Interest Rate Parity (CIP)
Roadmap

1. Chilean Pension Funds and FyF
2. Spot FX Market
3. Bank Hedging
4. Covered Interest Rate Parity (CIP)
Chilean Pension Funds

- Fund A: Equity
- Fund B: Equity
- Fund C: Equity
- Fund D: Fixed Income
- Fund E: Fixed Income
Financial Advisor “Felices y Forrados” (FyF)

Descubre cómo mejorar tus ahorros en AFP
Te avisamos cuándo cambiarte de fondo para aumentar tus ahorros

Menos pérdida
Más rentabilidad
Mejor calidad de vida
Financial Advisor “Felices y Forrados” (FyF)

- 82 portfolio recommendations over 2011-2020 (switch every ±5 weeks)
Financial Advisor “Felices y Forrados” (FyF)

- 82 portfolio recommendations over 2011-2020 (switch every ±5 weeks)
- Followers are typically male, young, frequent switchers, w/smaller accounts.
Financial Advisor “Felices y Forrados” (FyF)

- 82 portfolio recommendations over 2011-2020 (switch every ±5 weeks)
- Followers are typically male, young, frequent switchers, w/smaller accounts.
- No performance advantage over buy-and-hold strategies.
Financial Advisor “Felices y Forrados” (FyF)

- 82 portfolio recommendations over 2011-2020 (switch every ±5 weeks)
- Followers are typically male, young, frequent switchers, w/smaller accounts.
- No performance advantage over buy-and-hold strategies.
- Recommendations are related to past performance of the equity fund (A), but **unrelated** to FX fundamentals (e.g., copper prices).
Financial Advisor “Felices y Forrados” (FyF)

- 82 portfolio recommendations over 2011-2020 (switch every ±5 weeks)
- Followers are typically male, young, frequent switchers, w/smaller accounts.
- No performance advantage over buy-and-hold strategies.
- Recommendations are related to past performance of the equity fund (A), but \textbf{unrelated} to FX fundamentals (e.g., copper prices).
- Recommendations induce strong flows.
Roadmap

1. Chilean Pension Funds and FyF
2. **Spot FX Market**
3. Bank Hedging
4. Covered Interest Rate Parity (CIP)
Chilean Peso Depreciates after FyF Recommends to move to Fund A
Motivation
This Paper
Roadmap
Chilean Pension Funds and FyF
Spot FX
Bank Hedging
CIP
Conclusions

Roadmap

1. Chilean Pension Funds and FyF
2. Spot FX Market
3. **Bank Hedging**
4. Covered Interest Rate Parity (CIP)
Banks’ Net Positions in Spot and Forward Markets

- Net position forward
- Net position spot
- Net exposure (spot+forward)
Banks’ Hedging following FyF Recommendation

FyF Recommendation: Switch towards Fund A

- **Pension Funds**: Buy USD
- **Spot Market**: Sell USD
- **Local Banks**: Buy Forward USD
- **Forward Market**: Sell Forward USD
- **Foreigners**: Buy USD
Spot Market Flows and FyF Recommendations

Net Flow Spot Market (MM USD)

-1,000
-500
0
500
1,000

1. pension
2. foreign
3. brokers
4. insurance
5. mut. funds
6. firms
7. others

Decrease in A
Increase in A
Forward Market Flows and FyF Recommendations

- Net Flow Derivatives Market (MM USD)
- 1. pension
- 2. foreign
- 3. brokers
- 4. insurance
- 5. mut. funds
- 6. firms
- 7. others

- Decrease in A
- Increase in A
Roadmap

1. Chilean Pension Funds and FyF
2. Spot FX Market
3. Bank Hedging
4. **Covered Interest Rate Parity (CIP)**
The cross-currency basis (CCB) measures deviations from CIP:

\[ CCB \equiv (1 + r_{us}) - (1 + r_{chile}) \times \frac{S}{F} \]
Covered Interest Rate Parity (CIP)

- The cross-currency basis (CCB) measures deviations from CIP:

\[ CCB \equiv (1 + r_{us}) - (1 + r_{chile}) \times \frac{S}{F} \]

- A negative CCB implies that dollar-swapped Chilean deposits are paying “too much.”
Cross-Currency Basis of Chilean Peso (2011-2020)
CCB falls after FyF Recommends to move to Fund A
The action is in the forward premium, not interest rates
Banks charge a markup for their unique position between the spot and the forward market.
Interpretation of CIP violations

- Banks charge a markup for their unique position between the spot and the forward market.
- Banks move the forward premium depending on whether they need to buy/sell forward.
Interpretation of CIP violations

- Banks charge a markup for their unique position between the spot and the forward market.
- Banks move the forward premium depending on whether they need to buy/sell forward.
- Further evidence linking CIP violations to banks:
Interpretation of CIP violations

- Banks charge a markup for their unique position between the spot and the forward market.
- Banks move the forward premium depending on whether they need to buy/sell forward.
- Further evidence linking CIP violations to banks:
  - Stronger effects at the end of quarters (Du, Tepper, and Verdelhan, 2018).
Interpretation of CIP violations

- Banks charge a markup for their unique position between the spot and the forward market.
- Banks move the forward premium depending on whether they need to buy/sell forward.
- Further evidence linking CIP violations to banks:
  - Stronger effects at the end of quarters (Du, Tepper, and Verdelhan, 2018).
  - Stronger effects when bank capital has recently declined (Du, Hébert, and Huber, 2023; He, Kelly, and Manela, 2017).
Conclusions

- Pension flows in Chile react strongly to market timing recommendations.
Pension flows in Chile react strongly to market timing recommendations.

Foreign exchange rates are sensitive to these non-fundamental flows.
Pension flows in Chile react strongly to market timing recommendations.

Foreign exchange rates are sensitive to these non-fundamental flows.
  - We estimate a price elasticity of 0.83 for the Chilean Peso (Gabaix and Koijen, 2021).
Conclusions

- Pension flows in Chile react strongly to market timing recommendations.
- Foreign exchange rates are sensitive to these non-fundamental flows.
  - We estimate a price elasticity of 0.83 for the Chilean Peso (Gabaix and Koijen, 2021).
- Banks’ hedging transmits non-fundamental shocks from spot to forward markets.
Conclusions

- Pension flows in Chile react strongly to market timing recommendations.
- Foreign exchange rates are sensitive to these non-fundamental flows.
  - We estimate a price elasticity of 0.83 for the Chilean Peso (Gabaix and Koijen, 2021).
- Banks’ hedging transmits non-fundamental shocks from spot to forward markets.
- Banks’ risk bearing constraints contribute to CIP violations.