

**Narrow Framing and Risk Management**  
**Levin-Konigsberg, Stein, García-Averell, López-Castañón**

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Comments

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# What Does Paper Do? Summary Contribution and Findings

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- **Key Contributions**

1. Advance and quantify a channel limiting the use of derivative: narrow framing
2. Operational/Financial profits: Path dependence → performance in previous derivative transactions predicts future derivative use

- **Methodology**

- a. Universe Mexico's derivative transactions along with customs data
- b. Regression kink design to measure the impact of narrow framing on risk management

- **Findings**

1. When previous losses increase by 1 p.p., firms become 4.24 p.p. less likely to take out a new derivative position within a time frame; across industries
2. Evidence not driven by net worth (collateral constraints)

# Stylized Facts

- **Fact 1:** Even with access to the derivatives markets, firms with currency exposure often choose not to hedge.
- **Fact 2:** Firms are less likely to take a new position after experiencing a loss in their most recent expiration. We focus now on the likelihood of firms taking a new position in the 90 days after a forward position expires, conditional on whether said expiration resulted in gains or losses for the firm.
- **Fact 3:** The empirical likelihood of taking a new position after an expiration is a kinked function of the percent gain/loss of the previous expiration, with the kink at zero

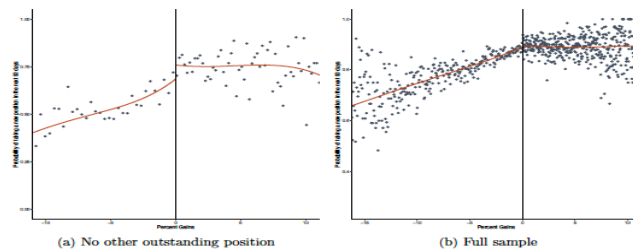


Figure 7: Probability of taking a new position as a function of the percent gain or loss in the previous expiring position

# Reactions

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- **Firms hedge even under dominant currency as firms retain currency risk** (Mexico, Korea, Chile, Brazil, ...)
  - **But hedging is partial** (GM case, Desai Veblen; Alfaro, Calani, Varela, 2021, Jung, 2021)
    - Under market imperfections: optimal (correlation investment opportunities and availability of internal funds, Froot et al. 1993)
    - Limited: Collateral constraints (Rampini and Viswanathan, 2020; Rampini et al. 2014); Transaction costs, economies of scale (Geczy et al. 1997; Alfaro and Calani, 2023).
- New explanation for limited use of derivatives
  - There is hedging! But financial losses curtail use: narrow framing
- Important findings:
  - **Hedging adds value to the firms** (Jung 2021, Alfaro, Calani, Varela, 2021).
  - Different explanations: different policy implications

# Comments

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- I agree qualitatively (e.g. Chile in the 90s)
- But I think perhaps a bit more can help refine quantitative results
  - Extensive results have different implications from intensive ones
  - When volatility increases, more hedging
- Suggestions
  - Data: Tell us more about the firms (transactions) using derivatives (and not using)
    - Granular data is still scarce, research is opening “black box” of hedging
    - A better measure of exposure may reduce quantitative estimates
  - Explanations
    - Some weight to other explanations

# Who Uses Hedges in Mexico?

## More on Market, More on the Firms

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### Market

- OCT Market (intermediated via banks): Sticky Relations
  - Is the hedge given by the domestic bank for trade credit exposure?
- What about Swaps? Are instruments non-derivable?

### Firms

- Is the information at the plant or corporation level?
- Who Exports, Imports, Both, MNC in Mexico? Size of firms, sectors...

### Sample

- Sample selection, subsamples: How much exposure is being dropped?
- Net Importers: by “Net” it means they export? No just import (like retail)?
- Exports can be hedged affecting results
  - Maturity, frequency, and amount differences, gross transactions hedged (ACV, 2021)

➔ Caution to overinterpret may not apply to all.

# Mexico: A lot of Trade, a lot of Intra Firm Trade

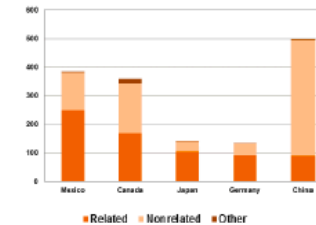
Mexico trade balance per country per year from 1995 to 2022									
	1995	2000	2010	2015	2016	2017	2018	2019	2020
<b>Exports, USD</b>	79.5	166.1	298.5	380.6	374.0	409.4	450.7	460.6	417.2
as % exports									
European Union	4%	3%	5%	5%	5%	6%	6%	5%	5%
NAFTA	86%	91%	84%	84%	84%	83%	83%	84%	84%
Canada	2%	2%	4%	3%	3%	3%	3%	3%	3%
United States	83%	89%	80%	81%	81%	80%	79%	80%	81%
Rest of Western Hem.	7%	4%	7%	6%	6%	6%	5%	5%	5%
Asia	3%	1%	4%	4%	5%	6%	6%	6%	6%
China	0%	0%	1%	1%	1%	2%	2%	2%	2%
Japan	1%	1%	1%	1%	1%	1%	1%	1%	1%
Other Asia and Pacific	1%	1%	2%	2%	2%	3%	3%	3%	3%
Rest	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>Imports, USD</b>	72.5	174.5	301.5	395.3	387.1	420.4	464.3	455.2	383.0
as % imports									
European Union	10%	9%	11%	11%	11%	12%	12%	12%	11%
NAFTA	76%	75%	51%	50%	49%	49%	49%	47%	46%
Canada	2%	2%	3%	3%	2%	2%	2%	2%	2%
United States	74%	73%	48%	47%	46%	46%	46%	45%	44%
Rest of Western Hem.	3%	3%	5%	4%	4%	4%	4%	4%	4%
Asia	11%	12%	32%	34%	35%	35%	35%	37%	38%
China	1%	2%	15%	18%	18%	18%	18%	18%	19%
Japan	5%	4%	5%	4%	5%	4%	4%	4%	4%
Other Asia and Pacific	4%	6%	12%	12%	13%	13%	13%	14%	15%
Rest	0%	0%	0%	0%	0%	0%	0%	0%	0%

## U.S. GOODS TRADE: IMPORTS AND EXPORTS BY RELATED-PARTIES, 2021

U.S. CENSUS BUREAU | U.S. DEPARTMENT OF COMMERCE

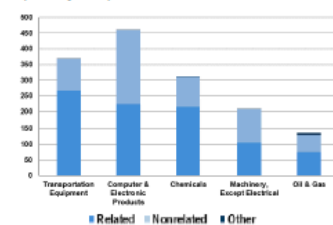
### IMPORTS FOR CONSUMPTION

Top 5 Countries By Related-Party Trade (billions of dollars)



The figure above shows a snapshot of U.S. related-party imports from selected countries sorted by related-party value.

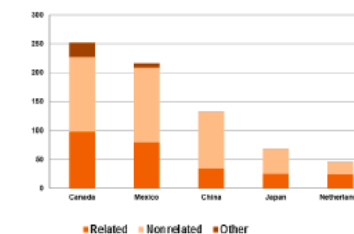
Top 5 Three-Digit NAICS Codes By Related-Party Trade (billions of dollars)



The figure above shows the top goods categories for imports. These were transportation equipment (NAICS 336), computer and electronic products (NAICS 334), chemicals (NAICS 325), machinery, except electrical (NAICS 333), and Oil and Gas (NAICS 211).

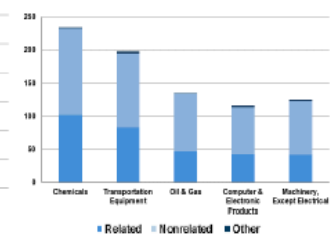
### DOMESTIC EXPORTS

Top 5 Countries By Related-Party Trade (billions of dollars)



The figure above shows a snapshot of U.S. related-party domestic exports from selected countries sorted by related-party value.

Top 5 Three-Digit NAICS Codes By Related-Party Trade (billions of dollars)



The figure above shows the top goods categories for exports. These were chemicals (NAICS 325), transportation equipment (NAICS 336), Oil and Gas (NAICS 211), computer and electronic products (NAICS 334), and machinery, except electrical (NAICS 333).

# Data

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- Currency Invoice not observed: assumed in dollars. ✓✓✓
- Market dominated by forwards. But Swaps? (Debt) ✓✓
- Loan: Are Bank loans in Mexico? Bonds? FDI (MNCs) ✓
- Calculating Exposure:
  - Because firms are aware of their future cross-border transactions before they actually occur, we construct each firm's monthly natural MXN/USD exchange rate exposure by summing its next **three months** of net imports. When we use the term “net importer”, we refer to firm-months in which this value is positive. These net importers face a natural short USD exposure. ?
  - But this is not the actual exchange rate exposure
    - And not all actual exposures are hedged: not nec. optimal; transaction costs (large ones, ACV, 2021); and collateral constraints;
      - Could some of these affect quantitative results?



# Trade: Different Maturity, Amounts, Frequency

## Alfaro, Calani, Varela, 2021

→ Differences in Maturity, Amount and Frequency, and there is Uncertainty.

→ Motivating example:

### 1. Maturity:

- In  $t$ , a firm imports with a trade credit due in  $t + 1$  ( $M_{t \rightarrow t+1}$ ); exports with trade credit due in  $t + 2$  ( $X_{t \rightarrow t+2}$ ).

### 2. Amount:

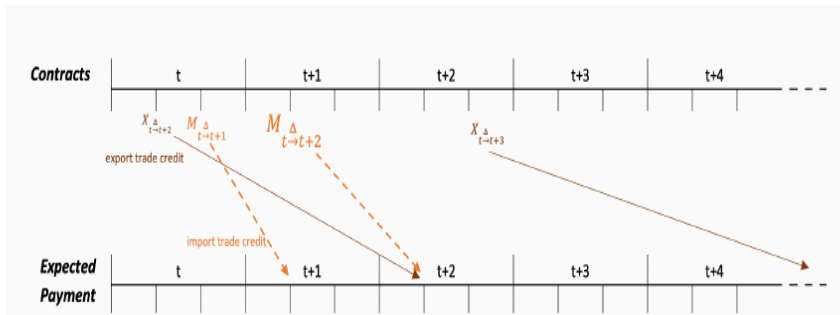
- In  $t + 1$ , the firm imports and gets trade credit for  $t + 2$  ( $M_{t+1 \rightarrow t+2}$ ). It could match with  $X_{t \rightarrow t+2}$ , but  $M_{t+1 \rightarrow t+2} > X_{t \rightarrow t+2}$ .

### 3. Frequency:

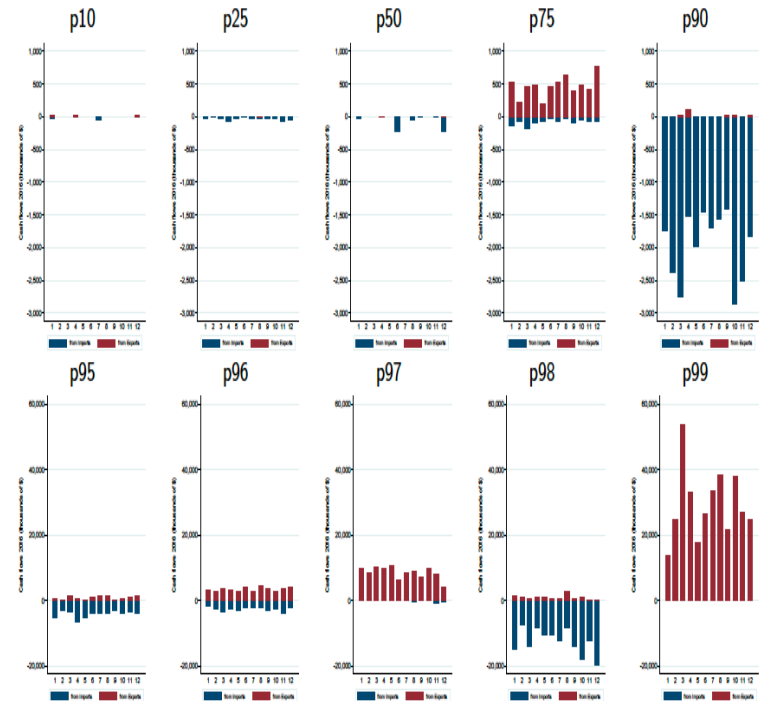
- In  $t + 2$ , the firm exports ( $X_{t+2 \rightarrow t+4}$ ) and issues a trade credit due in  $t + 4$ , but no imports due in  $t + 4$ .

### 4. Uncertainty:

- Timings in production and shipping can lag or lead payments.



- Cash flows in 2016 for firms with both  $X > 0$  &  $M > 0$  by firm size (in volume of trade).
  - Smaller firms have cash flows from exports and imports do not coincide in time.
  - Larger firms have more frequent transactions, but mostly on one side of trade.



# Conjecture

- Transactions hedged tend to be the large ones

	min	25p	median	75p	max	mean	s.d
Position Size (1000 USD)	1	45	100	296	395,370	601.5	344.2
Position length (days)	1	25	48	90	744	70.48	70.616
Time to next position (days)	0	2	12	42	1275	42.33	86.72
# of positions by firm	1	4	16	50	4760	64.99	196.379

Table 3: Summary Statistics for USD-MXN forward positions

- The distribution of transactions is not random; even less the “large” ones (timing/period does not necessarily imply a “Hedgeable” transaction follows)
  - I doubt it will eliminate results, but it may lower estimates.
  - Intensive margin: **Overall, it seems that firms are not adjusting their operational exposure differentially based on gains or losses in their derivatives positions, instead, they seem to be reducing their hedge ratios after incurring losses.**

# Why and to What Extent Do Firms Hedge FX Risk?

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- Analyzing firms' FX hedging is “difficult” Froot et al. (1993).
  - MM Benchmark: No hedging activities/would not add value
- But corporate hedging is ubiquitous: Why? Market imperfections --- financial frictions, transaction costs, convex tax schedules--- **volatility can be costly, conveying a role for a firm's hedging**
  - **This is consistent with the results**
- But the hedging is partial
  - Economies of Scale, Fixed Costs: larger firms, larger transactions
  - Optimal (correlation investment opportunities and availability of internal funds):  
“Indeed much of the previous work has the extreme implication that firms should hedge fully—completely insulating their market values from Hedgeable risk:” Froot et al. 93
  - Collateral Constraints
- Do these explanations explain some of the quantitative results? Hard to measure

# Probability of a New Position Based on Outcome “Optimal”?

- A “loss” in the analysis is an appreciation.
- Is this correlated with lower interest rates (changing the opportunity cost of external finance which affects decisions in Froot et al. 1993)
- Change in exchange rate expectations?
- Change investment opportunities after Trump-AMLO? (NAFTA renegotiation)

- $P(n) = \max \theta f(I) - I - C(e), \theta = a(\epsilon - \bar{\epsilon}) + 1;$

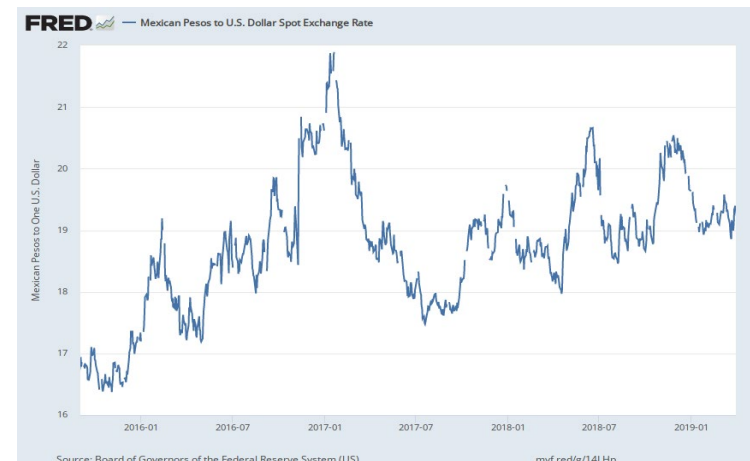
- $\alpha$  being a measure of correlation between investment opportunities and the risk to be hedged ( $\epsilon$ ),

→  $\text{cov}(P_w, \epsilon) = 0$ : reduce the variability of the shadow value of internal funds.

→ Data restrictions



(b) Quarterly cuts



Source: Board of Governors of the Federal Reserve System (US)

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# Collateral Constraints

## Effect of Past Decisions

- Collateral constraints: All profits, not just non-operational
- But there is some evidence that there is some effect
- Perhaps accounts for some:
  - check delinquency data from credit registry?

### Financial Constraints

	FX=1 (Firm FX derivatives)		Sales FX derivatives		Purchases FX derivatives	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Financial Constraints						
$\chi^{TC}$	0.020*** (0.004)	0.019*** (0.004)	0.047*** (0.008)	0.046*** (0.008)	0.000 (0.007)	0.000 (0.007)
$M^{TC}$	0.054*** (0.005)	0.054*** (0.005)	0.012* (0.007)	0.012* (0.007)	0.155*** (0.015)	0.155*** (0.015)
FCD	-0.015*** (0.005)	-0.016*** (0.005)	-0.015 (0.013)	-0.015 (0.013)	-0.005 (0.013)	-0.005 (0.013)
Delinquency	-0.024*** (0.003)	-0.022*** (0.003)	-0.008** (0.003)	-0.008** (0.003)	-0.016*** (0.003)	-0.015** (0.003)
Credit line		0.011*** (0.002)		0.005** (0.002)		0.007*** (0.002)
Observations	2,264,326	2,264,326	2,264,326	2,264,326	2,264,326	2,264,326
$R^2$	0.53	0.53	0.54	0.54	0.65	0.65
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-industry FE	Yes	Yes	Yes	Yes	Yes	Yes

# Narrow Framing and Management

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- My hunch is that result will survive, but quantitatively smaller
- But before subsidizing shrinks for traders...
- Is it driven by Organization? (next paper)
  - Interactions traders in London: Hedging is not to make profits/loses it is to hedge!
- Is it the CEO? Delegation, Compensation? A bad trader
  - Bloom, Sadun, Van Renan measures in Mexico
- Does it explain why a manager would care about a contractual loss and not the counterfactual (exchange rate still appreciated)
  - Does it explain why does it work with increased volatility?

# Final Thoughts

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- A great interesting with new explanation: LKSGALC, 2023
- Firms do hedge, but it is partial, and we need to understand why.
  - New granular data sets matched to firm-level data+ new research: opening the “black box” of corporate firms’ FX hedging!
- Critical research agenda!