Corporate Earnings Sensitivity to FX Volatility: Evidence from Peru

Alberto Humala

Central Reserve Bank of Peru

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Corporate Earnings and FX Volatility

Motivation

- ¿Is currency volatility an important risk factor?
  - Sudden or intense depreciation
- ¿How exposed are firms to FX risks?
  - Return sensitivity
- ¿How firms respond to FX shocks?
  - Hedging strategies
- ¿Does is affect credit default risk?
  - Financial vulnerabilities

Research Goals

- The objective of this research is to document if FX shocks have a significant impact on firm returns and if this sensitivity is enhanced by the firm's net exposure to currency risks.
- Identification of financial vulnerabilities: Does excessive FX exposure impose systemic risks?

Contents

1. Dataset
2. Earnings and currency depreciation
3. Sensitivity of FX exposure to depreciation
4. Hedging response
5. Panel data estimation
6. Credit ratings impact
7. Conclusions

1. Dataset

- Financial system is still partially dollarized.
- Currency mismatches are not directly reported in Financial Statements.
- They are informed in the Notes to Financial Statements.
- However, not all firms with FX exposure report data quarterly.
- Derivative positions are included (but not regularly in all cases).

Heterogeous Reports

- Reports on FX exposure are heterogeneous.
- Information on FX positions needs to be hand-collected.

Foreign Exchange Positions

In Notes to Financial Statements	Variables
Assets in USD	$Assets_{USD}$
Liabilities in USD	$Liability_{USD}$
FX Spot Position	$FXSP = Assets_{USD} - Liability_{USD}$
Derivatives long	D_{LONG}
Derivatives short	DShort
FX Derivative Position	FXDP = DLong - Dshort
FX Global Position	**FXGP = FXSP + FXDP**

Selection of Firms

- Database: biggest 160 firms reporting financial statements to the Superintendence of Securities Markets.
- Selected: those from sectors other than financial, mining, and public service sectors.
- Sample: those reporting regularly (quarterly) their FX positions in the "Notes to Financial Statements".

Size and Representativeness

- Small sample size, but still representative of selected firms.
- Extrapolate conclusions (from sample) to selected firms?.

Size Representativeness of Sample Firms

Firm Size	Number of Firms			Total Assets (USD millions)			Sample as % of	
(USD millions)	Database	Selected	Sample	Database	Selected	Sample	Database	Selected
500+	59	20	11	201 529	26 212	15 183	7.5%	57.9%
100 - 500	54	33	9	11 469	6 556	2 155	18.8%	32.9%
Up to 100	47	25	7	2 276	1 152	351	15.4%	30.5%
Total	160	78	27	215 273	33 919	17 689	8.2%	52.2%

Use of Derivative Hedging

- Use of derivatives is mostly concentrated on the bigger firms.
- Derivative hedging mainly through forwards (for short-term liabilities) and swaps (for USD bond issues).

Use of Derivative Hedging

Firm Size (USD millions)	Number of Firms			
	Regular	Sporadic	No Use	Total
500+	3	4	4	11
100 - 500	1	2	6	9
Up to 100	0	1	6	7
Total	4	7	16	27

2. Earnings and Currency Depreciation

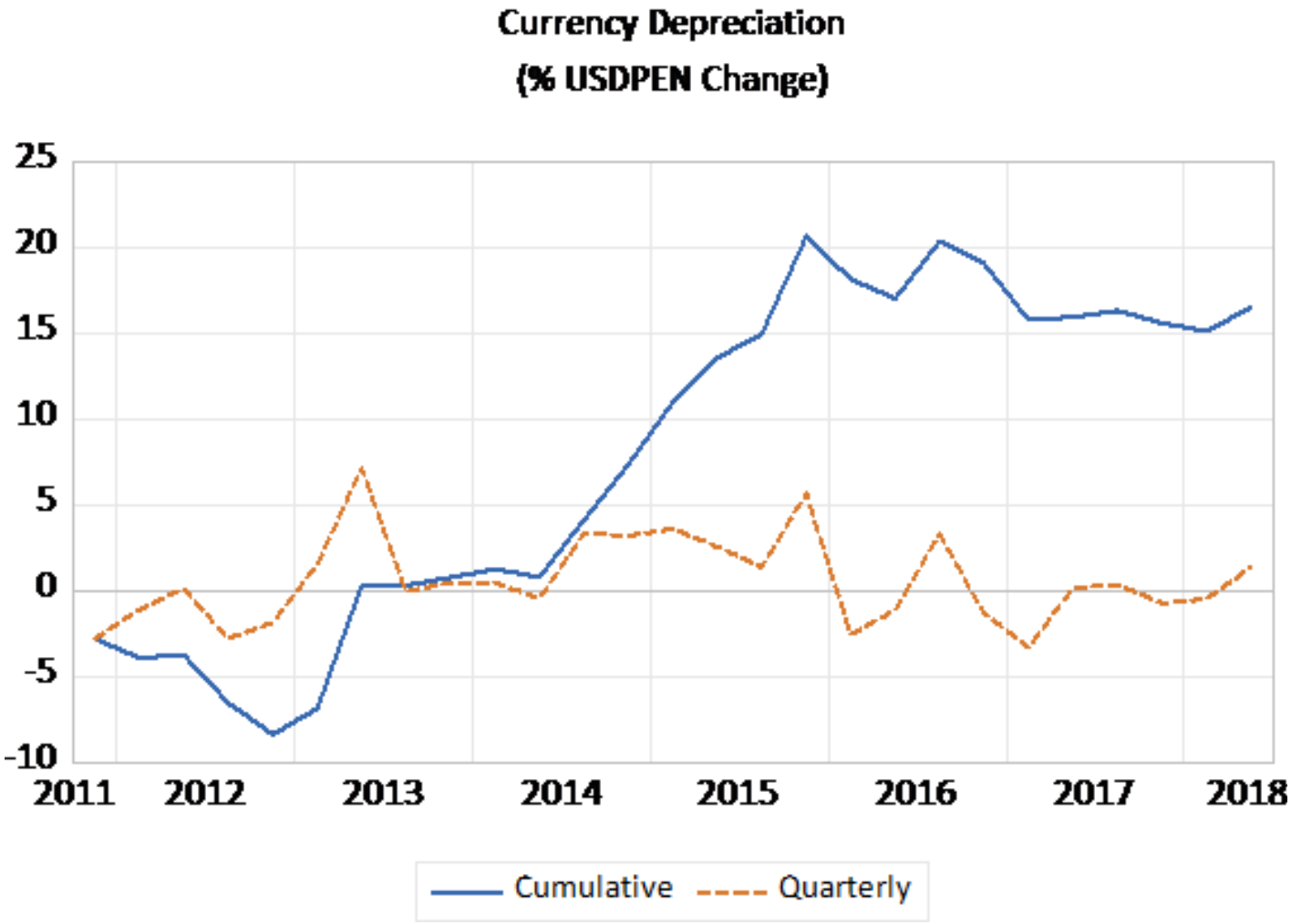
- Valuation changes in monetary accounts due to FX shocks are considered in the profit/losses report.

Profit/Losses Statement

Business Income	+
Sales Costs	-
Gross Earnings	=
Other Costs	-
EBIT	=
FX Earnings	+
Other Financial Earnings	+
EBT	=
Taxes	-
Net Earnings	=

Exchange Rate Dynamics

- Over the 2013-2015 episode (taper tantrum) the PEN accummulated a 29-percent depreciation.



Currency Depreciation Impact on Earnings

- The impact of currency depreciation on earnings of FX-risk exposed firms is significant.
- Regular derivative hedging lessens the impact.

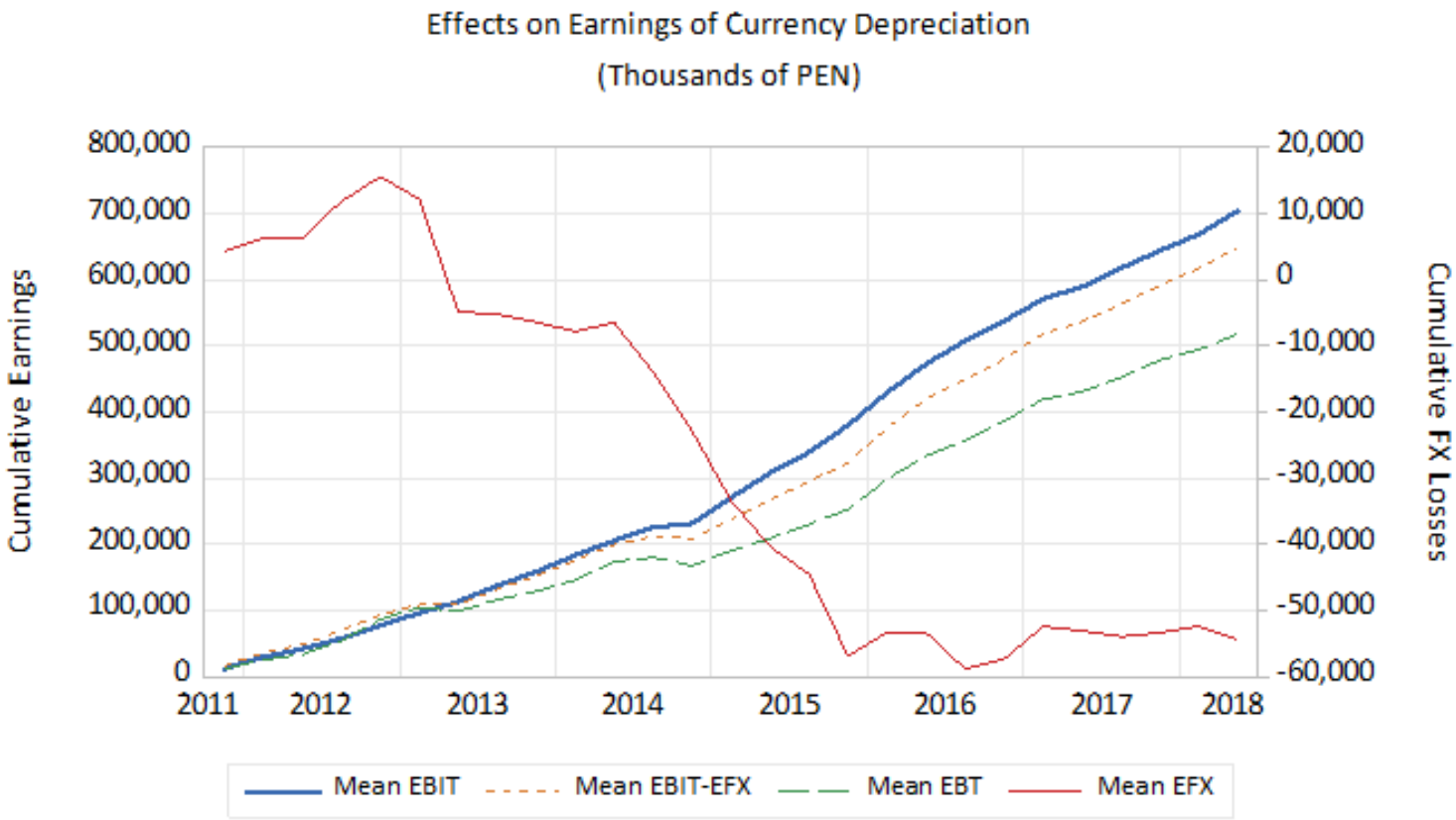
Currency Depreciation Effects on Corporate Earnings (%) *

Period	USDPEN	Regular Derivative Hedging		No Regular Derivative Hedging		All Firms	
	Change	FX Earnings/ EBIT	Financial Earnings/EBIT	FX Earnings/ EBIT	Financial Earnings/EBIT	FX Earnings/ EBIT	Financial Earnings/EBIT
2012	-5.6	8.1	28.8	26.4	-1.0	17.7	13.2
2013 - 2015	29.1	-12.3	-23.9	-35.7	-69.4	-23.8	-46.3
2016 - 2018	-1.1	0.1	-18.3	-0.5	-26.3	-0.3	-23.7
2012 - 2018	22.4	-5.4	-16.3	-10.8	-39.5	-8.6	-29.8

* Financial Earnings equals Earnings Before Taxes (EBT) minus Earnings Before Interest and Taxes (EBIT). It includes FX earnings.

FX Losses and Increasing EBIT

- A 29% depreciation period (2013-2015) reduced corporate results but total earnings were growing.
- Up to 2013 many large corporate firms issued global bonds in USD, at longer terms and benefiting from low interest rates and risk appetite.



3. Sensitivity of FX Exposure to Depreciation

- During 2013- 2015 firms were most exposed to FX risk.
- A further 80% (30%) depreciation would have exposed up to 52% (38%) of equity.
- Firms reacted reducing their FX exposure substantially.

Depreciation Sensitivity of FX Risk Position (%) *

PERIOD	USDPEN Change	Regular Derivative Hedging			No Regular Derivative Hedging			All Firms		
		FXRP / Equity			FXRP / Equity			FXRP / Equity		
		Actual	30% ?FX	80% ?FX	Actual	30% ?FX	80% ?FX	Actual	30% ?FX	80% ?FX
2012	-5.6	10.0	13.0	18.0	30.6	39.8	55.1	24.6	32.0	44.3
2013 - 2015	29.1	24.1	31.4	43.4	31.0	40.3	55.8	29.0	37.7	52.2
2016 - 2018	-1.1	8.4	10.9	15.1	13.3	17.3	23.9	11.8	15.3	21.2
2012 - 2018	22.4	15.4	20.0	27.6	23.4	30.4	42.0	21.0	27.3	37.8

* FX Risk Position (FXRP) = USD Liabilities - (USD Assets + Net Derivative Position).

4. Hedging Response to Depreciation

- After the currency depreciation period of 2013-2015, firms reduced their FX exposure.
- Less FX risk exposure came mainly through reducing FX liabilities.

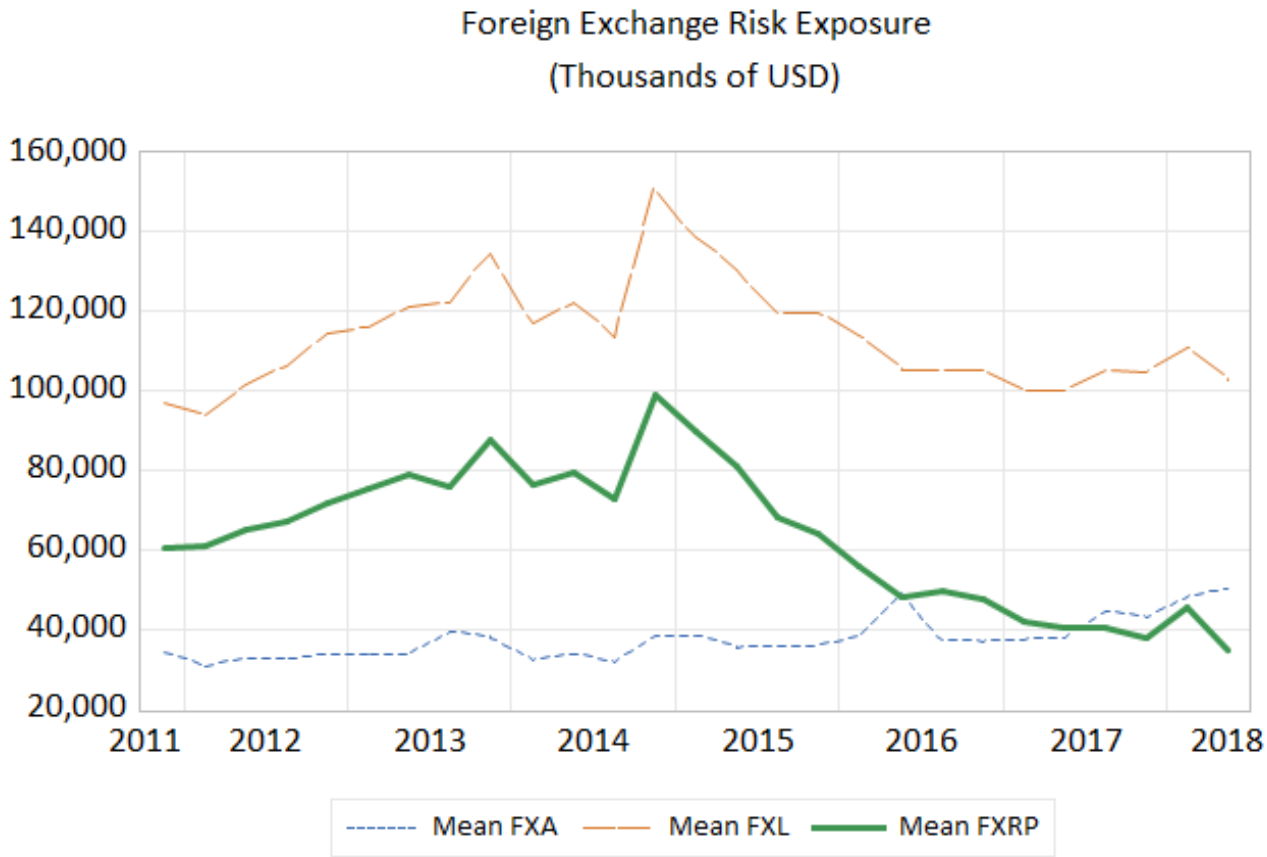
Hedging FX Corporate Risk (%)

PERIOD	USDPEN	Regular Derivative Hedging		No Regular Derivative Hedging		All Firms	
	Change	(FXA+FXDP) / FXL	FXL / TL	(FXA+FXDP) / FXL	FXL / TL	(FXA+FXDP) / FXL	FXL / TL
2012	-5.6	68.8	26.6	27.6	50.7	37.5	41.7
2013 - 2015	29.1	55.0	37.8	30.2	50.0	38.5	45.1
2016 - 2018	-1.1	77.4	26.0	58.1	33.4	64.6	30.5
2012 - 2018	22.4	65.0	30.9	39.8	42.4	47.9	37.8

* FXA = FX Assets; FXL = FX Liabilities; FXD = FX net derivative position.

Decrease in Foreign Exchange Liabilities

- After 2015 there was a substantial decrease in FX liabilities.
- Firms that did not use derivatives before 2015, would not hedge their positions through them afterwards either.



5. Panel Data Estimation

- Sample estimation: 2011Q4 - 2018Q2.
- Baseline equation:

$$EFX_{it} = \alpha + \beta_1 DFX_t + \beta_2 FXRP_{it} + \beta_3 DFX_{t-1} * FXRP'_{it} + X_{it} + \upsilon_{it}$$

  - EFX_{it} = Earnings from FX-valuation (as % of equity).
  - DFX_t = Percentual (log) variation in the exchange rate.
  - $FXRP_{it}$ = FX risk position (as % of equity).
  - $FXRP'_{it}$ = FX risk position (ratio to equity).
  - X_{it} = Control variable for firm's idiosincracies (i.e. firm size, leverage).

Estimation Results

- Significant negative effects from depreciation, FX risk positions, and the interact of these factors on corporate earnings.

Parameter Estimates for Earnings by FX Variation (EFX)

Sample: 2011Q4 - 2018Q2	Scale Variable			
	Fixed Equity (2017Q4)		Dynamic Equity	
Depreciation (DFX)	-0.177 ***	-0.171 ***	-0.242 ***	-0.242 ***
	(0.013)	(0.012)	(0.020)	(0.020)
FX Risk Position (FXRP)		-0.019 ***		-0.023 ***
		(0.002)		(0.002)
FXRP Change (DFXRP)	-0.030 ***		-0.040 ***	
	(0.004)		(0.004)	
DFX (-1) * FXRP	-0.252 ***	-0.122 ***	-0.329 ***	-0.124 ***
	(0.034)	(0.036)	(0.037)	(0.040)
Constant	-0.051	0.250 ***	-0.085 *	0.426 ***
	(0.033)	(0.046)	(0.051)	(0.068)
Observations	729	729	729	729
R^2	0.395	0.415	0.426	0.422
Adjusted R^2	0.368	0.390	0.401	0.397

Note: ***, **, and * indicate parameter significance at 1%, 5% and 10%, respectively.

6. Credit Ratings Impact

- Despite the significant impact on corporate earnings, no credit risk reclassification have taken place (for these firms).
- Correspondingly, financial costs would have not been affected (still low-interest rates scenario).

Credit Classification (USD millions)

Firm Size	Credit Outstanding		
	Normal	Refinanced or due	%
Small	0.1	0.0	0.0%
Medium	1 619	0.1	0.0%
Big	39 350	0.1	0.0%
Corporates	183 513	909	0.5%

7. Conclusions

- Important negative impact on corporate returns from depreciation shocks:
  - The larger the FX-risk exposure, the larger the impact.
  - Those effects are better absorbed by firms in a growing-earning cycle.
- Hedging strategies would decrease the impact, but its use is not extensive and it is heterogenous:
  - Bigger firms tend to use financial derivatives.
  - Firms without previous use do not adopt derivative hedging after FX shocks.
- Despite the significant reduction on corporate earnings, banks did not reclassified firms' credit risk.
- FX exposure assessment contributes to stress testing scenarios.

Comments on: Corporate earnings sensitivity to FX volatility and currency exposure: evidence from Peru

F. Villatoro (UAI)

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Paper's Motivation

- This paper aims to measure the effects of FX shocks on non-financial firms' returns.
- Main features:
  - Firm-level info on currency risk positions
  - Balanced panel
  - Economy with relatively high use of foreign currency credit
  - Focus on periods of significant FX depreciation (29%)

Main Results

- FX shocks have produced considerable effects on non-financial firms' returns.
- Interestingly, non-hedging firms don't seem to alter their behavior after significant negative shocks.
- Micro and macro reasons why this paper is relevant
  - Micro: understanding possible effects of FX shocks on firm's solvency and liquidity
  - Macro: financial sector stability

(1) Sample

- Firm-level data for 27 firms.
- Relevant requirement: net FX position is reported.
  - More institutional setup would be useful for readers.
  - Is this disclosure "mandatory"? To what degree?
  - There are 51 firms with partial disclosure ($\rightarrow$ strategic behavior?)
    - Is disclosure turned on/off at the firms' convenience?
    - Perhaps after reporting embarrassing losses, or maybe in anticipation to a situation like this?
- There could be a nice story to tell regarding the frequency and timing of disclosure.
- If there isn't, maybe firms with less information gaps could be still be added to the panel.

(2) Firms' actions and expectations

- One of the papers' features that I found particularly interesting was the presence of information regarding firms' actions and expectations.
- Indeed, this type of information can be useful to explain firms' decisions.
- Examples:
  - On page 7: *"... Those (firms) that hedge through derivatives, monitor hedging costs closely, although their response would usually come with lags..."*
  - On page 8: *"By the end of 2011, most local firms with net short FX positions were confident that the local currency appreciation trend would continue..."*
- It would be useful to know the source of this info: Central Bank surveys? Anecdotical evidence?
- Perhaps additional variables could be found in these sources.

(3) Current Empirical Strategy

- Lineal panel with fixed effects.
- Is this specification standard in the literature?
- If it is, it would be useful to contrast results with previous studies.
- Regarding control variables, this include: firm size, leverage, (others?)
  - Could additional controls be included?
  - Is the firm part of a conglomerate? $\rightarrow$ possible risk-sharing between firms in group
  - Could year-dummies be used to substitute (temporarily) for more appropriate specifications that include time-varying regimes and/or coefficients?
- As the authors state, a relevant right-hand-side variable is endogenous, since firms may have freedom to influence their FX exposure.
  - Have you thought about the data you would need to address this issue?

(4) Additional variables of interest

- Right now, regressions aim to quantify effects on firm's earnings from FX valuation (as a percentage of equity).
  - Makes sense in terms of a firm's "solvency-at-risk"
- However, it seems that analysing effects on other accounting variables is feasible and interesting:
  - Impact on net cash flows? $\rightarrow$ liquidity concerns
- Moreover, there could be other financial outcomes of interest, which could be affected by the FX shocks:
  - Credit ratings
  - Credit cost
  - Banks' willing to lend
- A similar thing could be said regarding effects on real variables:
  - Production
  - Investment expenditure
  - Employment

(5) Related Research Questions

- The topic being addressed has relevant macro-financial implications.
- It seems that the data could be put to further use in order to move forward in exploring such issues.
- What determines a firms' FX exposure and hedging decisions?
  - difference in external versus internal cost of financing;
  - banks' willingness to lend in foreign currency;
  - Central Bank's regulations;
- Why do firms that don't hedge seem to be committed to this strategy in the face of the apparent costs they have suffered?
  - Are these firms "punished" by creditors?
  - Do CEOs at these firms face consequences for their decisions?
  - What about market value of these firms' shares and bonds?
  - Are these firms more/less competitive than their rivals?
- Should the Central Bank be worried about these findings?