Emerging markets' inflation-linked public debt: institutional factors

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This study reports large differences in the share of public debt linked to inflation and in the differentials between local currency (LC) rates and inflation-linked (IL) rates across emerging markets. It finds that *de facto* exchange rate stability, monetary policy discipline, and, to a lesser degree, inflation volatility are important drivers of the cross-country variation in IL debt issuance. It also finds that inflation volatility can explain a quarter of the cross-country variation in LC-IL rate differentials. Finally, it presents evidence that inflation underreporting in official statistics can shed light on differential recent changes in IL debt issuance in Argentina, Brazil and South Africa.

Keywords: inflation-linked debt, monetary policy discipline, exchange rate stability, inflation volatility, inflation underreporting

Subject classification codes: F34, H63

Introduction

Emerging markets issue a considerable share of their public debt linked to inflation (Gomez-Gonzalez 2019). However, the popularity of this type of debt is highly uneven across emerging markets. For example, between 1995 and 2016, Chile issued, on average, 85% of its local currency (LC) public debt linked to inflation, whereas Malaysia issued none.

Furthermore, within the countries issuing IL debt, there are large differences in the saving opportunities IL debt entail vis-à-vis LC debt. For example, in recent years, South African LC rates have been almost 2 percentage points (pp) higher than IL rates, adjusted for expected inflation, whereas Mexican LC rates have been approximately the same as adjusted IL rates.

Understanding key institutional factors behind the cross-sectional heterogeneity in emerging markets' IL debt issuance and in the LC-IL rate differentials is the focus of this study.

Previous work on emerging markets cross-country heterogeneity in rates and public debt composition has focused on LC vis-à-vis foreign currency (FC) (Hausmann and Panizza 2003; Claessens, Klingebiel, and Schmukler 2007; Burger, Warnock, and Cacdac Warnock 2012; Du and Schreger 2016; Du, Pflueger, and Schreger 2018; Cepni and Guney 2019; So, Valente, and Wu 2019 among others). Previous work on emerging markets' IL debt has studied its business cycle properties (Gomez-Gonzalez 2019) and their diversification ability (Swinkels 2012) and relatively less is known about the drivers of the observed cross-country heterogeneity.

To this end, the study builds on classical results in the optimal debt management and finance literatures to develop hypotheses, which are then tested using data on IL debt, LC-IL rate differentials, and institutional characteristics for a sample of emerging markets.

Consistent with the literatures on monetary policy with lack of commitment and tax smoothing, economies with less disciplined Central Banks and more volatile exchange rates, issue more IL debt. The data also shows some evidence of countries facing more stable inflation rates, issuing more IL debt, which is consistent with the literature on tax smoothing. Moreover, consistent with the finance literature on inflation risk premia, countries facing more volatile inflation rates, endure higher LC-IL rate differentials.

Finally, the study explores inflation underreporting in official statistics and IL debt issuance. The analysis finds that Argentina, which massively underreported true inflation between 2008 and 2015, decreased its share of IL debt from 39.5% to 11% in that period. Instead, Brazil and South Africa, which exhibit negligible differences between official inflation rates and true inflation rates, could increase or keep their IL

debt issuance stable. Lack of publicly available data on true inflation prevents an analysis of all countries in the sample.

The rest of the paper is structured as follows. Section 2 develops testable hypotheses from the previous literature. Section 3 describes the dataset used and presents the key facts about cross-country heterogeneity. Section 4 tests the hypotheses in section 2 and contains the main takeaways about the institutional factors driving IL debt and LC-IL rate differentials. Section 5 analyzes the relationship between official inflation accuracy and changes in IL debt in recent years. Lastly, section 6 concludes.

Hypotheses Development

This section builds on classical results in the optimal public debt management and finance literatures to develop hypotheses about institutional factors behind the cross-country heterogeneity in IL debt issuance and LC-IL rate differentials.

The normative literature on time inconsistency in monetary policy has shown that a government lacking commitment has the incentive to erode the real value of debt by increasing inflation. Issuing indexed debt can restore time consistency and lower borrowing costs by acting as a commitment device (Calvo 1978; Bohn 1988; Calvo and Guidotti 1990; Persson, Persson, and Svensson 1987, 2006; Alfaro and Kanczuk 2010). Under the purview of this literature, economies with Central Banks lacking commitment issue IL debt.

The models in Jeanne (2005), Du, Pflueger, and Schreger (2018) and Engel and Park (2018) predict that countries less disciplined in terms of monetary policy issue more FC debt and less LC debt. Because IL debt cannot be deflated away, it is comparable to FC debt (Fleckeinstein, Longstaff, and Lustig 2014; Sunder-Plassman 2018) and, thus, the first hypothesis is:

H1: Countries with less disciplined monetary policy authorities issue more IL debt.

A key finding of the optimal fiscal policy literature is that governments aim to smooth taxes over time (Barro 1979; Bohn 1990; Chari and Kehoe 1999; Angeletos 2002). Through the lens of this literature, high IL debt economies should be those facing more volatile exchange rates and more stable inflation rates. To see this, take a simple government's budget constraint:

$$T_t = e_t d_{t-1}^{FC} + p_t d_{t-1}^{IL} + d_{t-1}^{LC}, \quad (1)$$

where T_t denotes the tax burden, e_t the exchange rate defined as units of LC necessary to buy 1 unit of FC, and p_t the price level. The only government expense is repaying the public debt issued the period before, which can be FC debt (d^{FC}), IL debt (d^{IL}), or LC debt (d^{LC}). FC debt is premultiplied by e_t to convert it to LC. IL debt is premultiplied by p_t to convert it to LC, since IL debt is effectively a real security. LC debt enters directly.

From equation (1) it is clear that the more volatile the exchange rate is, the more volatile the tax burden becomes. Similarly, for a given price level the previous period (p_{t-1}), the more volatile the inflation rate is, the more volatile the price level and, hence, the more volatile the tax burden becomes. Thus, governments facing volatile exchange rates, *ceteris paribus*, should tilt their public debt portfolio towards public debt in LC[1] and governments facing volatile inflation rates, *ceteris paribus*, will likely tilt their public debt portfolio away from IL debt. The second and third hypotheses

[1] Whether it is IL or LC (non-indexed) public debt will likely depend on the authorities' ability to commit, like the previous literature strand highlights.

below summarize the previous conclusions:

H2: Countries facing more volatile exchange rates issue more IL debt.

H3: Countries facing more volatile inflation rates issue less IL debt.

The finance literature on nominal debt vis-à-vis IL debt has concluded that a differential in nominal rates and adjusted IL rates can be explained by an inflation risk premium since investors must be compensated for bearing inflation risk (Campbell and Shiller 1996; Bekaert and Wang 2010; Ermolov 2018). The fourth hypothesis poses that:

H4: Countries with more volatile inflation rates exhibit larger LC-IL rate differentials.

The next section describes the data used to test hypotheses H1-H4 above and the key facts on cross-country heterogeneity in IL debt issuance and LC-IL rate differentials.

Dataset and Key Stylized Facts

Dataset Description

The dataset used in this study comes from Gomez-Gonzalez (2019). It contains data on IL debt issuance, GDP deflator and the CPI-based measures of inflation, FC rates, LC rates, IL rates, and 4-year ahead expected inflation. The sources and data coverage are in the Appendix. I extend the dataset in several dimensions.

First, I extend the sample of countries to include Czech Republic, Indonesia, Thailand, and Malaysia. These countries issue virtually no IL debt in the period considered and were excluded from the earlier analysis since issuing positive amounts of IL debt was necessary to study IL debt's business cycle properties.

Second, I extend the time-series coverage of the shares of IL debt over total debt, LC debt over total debt, and FC debt over total debt from 2004-2016 to 1995-2017. To do this, I follow Du, Pflueger, and Schreger (2018) and use Bank of International Settlements (BIS) data sources for LC and FC debt instead of Arslanalp and Tsuda (2014), whose data starts in 2004.

Third, I include measures of the institutional characteristics posed in the hypotheses above: monetary policy discipline, exchange rate stability, and inflation volatility. What follows describes each of them in turn.

For monetary policy discipline, I follow Du, Pflueger, and Schreger (2018) and construct the correlation between the keywords "debt" and "inflation" in Financial Times articles between 1995 and 2017. The details on how to construct the measure are the following. Using the Factiva database, I count the number of articles mentioning "debt", "inflation", and the country name. Then, I subtract the number of articles mentioning "debt"', "inflation-linked"', and the country name, since some articles mentioning both "debt" and "inflation" could precisely be discussing IL debt and this error should affect high IL debt economies more. Finally, I divide this number by the geometric average of the number of articles mentioning just one of the keywords and the country name. This indicator is an inverse measure of monetary policy discipline: the more "debt" and "inflation" are discussed together in the press, the weaker the *de facto* separation between fiscal policy and monetary policy decisions.

For exchange rate stability, I take the country-by-country average of the corresponding measure in the Aizenman-Chinn-Ito Trilemma index (Aizenman, Chinn, and Ito 2010) between 1995 and 2017. The average captures better the time-invariant institutional characteristics over the period considered.

For inflation volatility, I calculate the country-by-country standard deviation of the inflation series, using the GDP deflator and the CPI, between 1995 and 2017.

Finally, this study explores official inflation statistics underreporting. To measure official statistics accuracy, I use the difference between the CPI-based inflation rate provided by countries' authorities and the inflation statistics coming from the Billion Prices Project (BPP). The BPP reports annual inflation rates based on online prices from large retailers and gives a more accurate representation of the actual inflation rates. Argentina, Brazil and South Africa are the only countries in the study's sample for which BPP-based inflation statistics are publicly available (Cavallo and Rigobon 2016)

Key Stylized Facts: Cross-sectional heterogeneity

The key stylized facts regarding the cross-sectional heterogeneity in IL debt issuance and LC-IL rate differentials across emerging markets are described next.

Table 1 shows the stark heterogeneity in IL debt issuance among emerging markets. Seven countries (i.e. Argentina, Brazil, Chile, Colombia, Mexico, South Africa and Turkey) have issued between 12 and 50% of their public debt linked to inflation, which represents between 13 and 84% of their LC debt. The remaining countries have issued, on average, less than 1% of their public debt linked to inflation, which represents about 1.5% of their LC debt.

Within the low IL debt group, Indonesia and Malaysia have never issued this type of debt. Czech Republic, India and Thailand have made small issuances during short periods of time. Finally, Hungary, Peru, Poland and Russia have issued this type of debt consistently, even if in small quantities, starting in the 2000s.

The two groups of countries, high and low IL debt economies, also differ in the share of LC debt issued and in the LC rate. High IL debt economies have issued, on

average, almost 30pp less of LC debt than low IL debt economies and have faced, on average, LC rates 5pp higher than low IL debt economies.

These conclusions come from running regressions of the form:

$$y_{it} = \alpha + \beta highild_i + \epsilon_{it} \quad (2)$$

where y_{it} is a variable of interest (e.g. share of LC debt, LC rate) and $highild_i$ is an indicator variable which equals 1 if the country is in the high IL debt economies group and 0 otherwise.

Because $highild_i$ is time-invariant, estimation by pooled ordinary least squares (OLS) provides consistent estimates of α and β. Effectively, α calculates a cross-sectional average of the variable of interest for the low IL debt economies and $\beta's$ significance tests whether there is a statistically significantly different average for the high IL debt economies.

Table 2 shows the OLS estimates of equation (2) for seven variables of interest: the share of IL debt, the share of LC debt, the LC rate, the share of FC debt, the FC rate, the CPI-based inflation rate, and the GDP deflator-based inflation rate. It shows that the difference in IL debt issuance across groups reported in the beginning of this subsection is statistically significant. Furthermore, it shows that the average LC debt share and the average LC rate are different across groups in the magnitudes stated before. There are no statistically significant differences in the average FC debt share, the average FC rate, or the average inflation rate across both groups, as the remaining rows show.

Finally, the analysis turns to the LC-IL rate differentials for those countries issuing IL debt. The calculations proceed as in Gomez-Gonzalez (2019) and the LC-IL rate differential is given by:

$$r^{LC} - r^{IL} + E(\pi) \quad (3)$$

where r^{LC} and r^{IL} are, respectively, the LC and IL rates and $E(\pi)$ is the 4-year ahead expected inflation rate[2]. The results are in table 3 and reproduce the findings in the earlier study.

Table 3 shows stark heterogeneity in LC-IL rate differentials. Five countries (i.e. Argentina, Brazil, Russia, South Africa and Turkey) exhibit positive LC-IL rate differentials, implying that, for these countries, investors in LC debt require higher rates of return than the accounted for expected inflation. The remaining countries exhibit negative LC-IL rate differentials. To test whether these differences are statistically significant, the last three rows in table 3 report the results on the following regression:

$$rdiff_{it} = \alpha + \beta highLCILdiff_i + \epsilon_{it} \quad (4)$$

where $rdiff_{it}$ denotes the LC-IL rate differential and $highLCILdiff_i$ equals 1 if the country is one of the five countries with positive LC-IL rate differential and 0 otherwise. The last row in table 3 shows the two groups have significantly different LC-IL rate differentials.

The most widespread interpretation of a positive LC-IL rate differential is that investors require a positive compensation for bearing inflation risk, an inflation risk premium. For the countries with high LC-IL rate differentials, IL debt offers large savings opportunities.

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[2] Longer-term expectations, instead of one-year ahead expectations, are necessary because the rates come from medium and long-term bonds. Unfortunately, longer-term forecasts with substantial historical coverage are not publicly available.

Hypotheses Testing Results

To test hypotheses H1-H4, I run cross-country regressions of the following forms:

$$\overline{s_i^{IL}} = \alpha + \beta_1 MPD_i + \beta_2 \overline{ERS_i} + \beta_3 sd(\pi)_i + \epsilon_i \quad (5)$$

$$\overline{rdiff_i} = \alpha + \beta sd(\pi)_i + \epsilon_i \quad (6)$$

where $\overline{s_i^{IL}}$ denotes the country-by-country average IL debt share in columns 2 and 5 of table 1, MPD is the (inverse measure of) monetary policy discipline described in the previous section, $\overline{ERS_i}$ is the average exchange rate stability, $sd(\pi)_i$ denotes inflation volatility, and $\overline{rdiff_i}$ denotes the country-by-country average LC-IL rate differential in columns 2 and 4 in table 3. The estimation results are in tables 4 and 5.

Table 4 shows the estimation results for equation (5). Specifications (A) and (B) differ in the measure of the price level used to calculate the inflation volatility: CPI or GDP deflator. Note that this implies they also differ in the number of observations since the World Development Indicators does not report CPI data for Argentina due to inflation underreporting. Specifications (C) and (D) differ from (A) and (B) in the measure of the exchange rate stability used. The former use exchange rate stability excluding pegs and captures *de facto* exchange rate stability and the latter includes the 1995-2001 Argentinean and 1999-2004 Malaysian pegs as ones since, *de jure*, the exchange rates were completely stable.

The results in table 4 overwhelmingly confirm H1. The estimated coefficient for the (inverse measure of) monetary policy discipline is positive and significant across all specifications. Hence, the data shows that the weaker the separation between fiscal and monetary policy decisions is in the country, the bigger the IL debt share countries issue. Figure 1 shows a scatterplot between (the inverse of) monetary policy discipline and the share of IL debt. The cross-country unconditional correlation is sizeable: 58.2% for the entire sample.

The results in table 4 also confirm H2. The estimated coefficient for exchange rate stability is negative, but only statistically significant in specification (B). When excluding pegs, the coefficient is negative and statistically significant in both specifications (C) and (D), suggesting that *de facto* exchange rate stability is more relevant than *de jure* exchange rate stability. Hence, the more *de facto* stable the exchange rate countries face is, the smaller the IL debt share countries issue. Figure 2 shows scatterplots of exchange rate stability and the share of IL debt: panel (A) uses the measure including pegs as ones and panel (B) excludes pegs. The cross-country unconditional correlations are, respectively, -30.9% and -45.1%.

The evidence on H3 is mixed. The coefficients on specifications (A)-(D) are all negative, but only statistically significant at a 10% significance level in specification (D). Hence, there is some evidence that countries facing volatile inflation rates, issue less of their public debt linked to inflation.

The last row in table 4 shows that the three institutional factors considered can explain about half of the cross-country variation in IL debt issuance. Another factor that could explain part of the remaining cross-country variation is the accuracy of official inflation statistics. The next section explores this possibility for three of the countries in the sample.

Finally, the analysis turns to the LC-IL rate differentials. Table 5 shows the estimation results for equation (6). Specifications (A) and (B) differ in the measure of the price level used to calculate inflation volatility. The number of observations is less than in table 4 since IL rates are only available for the subsample of countries that issue IL debt.

The results in table 5 confirm H4. The estimated coefficients on the standard deviation of inflation are both positive and the coefficient on CPI-based inflation

volatility is significant at a 10% significance level. Hence, the data shows that the more volatile inflation is in a country, the higher the inflation risk premia investors require. Figure 3 shows this finding in a scatterplot. The unconditional correlations are 57.4% for the CPI (panel A) and 59.4% for the GDP deflator (panel B).

In terms of explanatory power, inflation volatility can only explain about a quarter of the variability in inflation risk premia across emerging markets, as the last row in table 5 shows.

IL Debt and Inflation Statistics Accuracy

This section provides evidence on the importance of accurate official inflation statistics to explain recent changes in IL debt.

For Argentina, the BPP data between 2008 and 2015 shows that, on average, CPI-based inflation underestimated actual inflation rate by 13 percentage points. For Brazil and South Africa, the differences between these two inflation rates are, on average, smaller than 1 percentage point. See column 2 in table 6.

Column 3 in table 6 shows that in Argentina, where official inflation statistics underreported true inflation, the share of IL debt dropped from 39.5% to 11%. Brazil and South Africa, where the difference between official inflation statistics and true inflation is negligible, increased their share of IL debt.

Two observations strengthen the claim that inflation underreporting is behind Argentina's drop in IL debt. First, the press reported that official inflation statistics' lack of credibility was moving investors away from Argentinean IL debt[3]. Second, since

[3] For example, The Financial Times' article titled "Argentina: inflation-linked peso bonds take a dive" (June 16, 2012) or The Economist's article "Don't lie to me, Argentina" (June 20, 2014).

official statistics underreporting ended in December 2015 after a new government was elected, the Argentinean IL debt share reverted a ten year-long downward trend and, between 2015 and 2017, it increased by 0.6 pp.

Conclusions

The study reports stark heterogeneity in the share of public debt linked to inflation issued by emerging markets between 1995 and 2017, with some countries issuing more than a third of their LC debt linked to inflation and others none. It also shows that for some countries, IL debt has large savings potential with IL rates between 1 and 5 pp below LC rates, even after adjusting IL rates for expected inflation.

The study finds that exchange rate stability, monetary policy discipline, and, to a lesser degree, inflation volatility are important institutional factors behind the cross-sectional variation in IL debt. Countries with more volatile exchange rates, more stable inflation rates, and with Central Banks that take monetary policy decisions with fiscal considerations in mind, issue more of their public debt linked to inflation. Furthermore, observing the recent changes in the share of IL debt in Argentina suggests that inflation statistics credibility is also a relevant institutional factor behind IL debt issuance.

This study shows that the data is consistent with IL debt acting as a commitment device in economies lacking *de facto* monetary policy discipline. A relevant policy implication is that, for economies facing volatile exchange rates, IL debt is a good alternative to FC debt. Indeed, IL debt and FC debt solve a similar time-inconsistency problem in emerging markets, but IL debt, being in LC, is better at smoothing the government's tax burden. Moreover, the more volatile inflation rates are, the more countries can benefit from lower IL rates in comparison to LC rates. Finally, the analysis highlights the importance of inflation statistics accuracy to sustain or increase

IL debt issuance over time, adding to the policy prescriptions for countries issuing IL debt.

Consistent with previous work on LC debt, the analysis exhibits a relevant benefit of *de facto* monetary policy discipline. LC rates in low IL debt economies (economies with more disciplined monetary policy) are almost half those in high IL debt economies (economies with less disciplined monetary policy). Consequently, the share of LC debt in low IL debt economies is about double the one in low IL debt economies.

Exploring further the cross-country variation in inflation risk premia in emerging markets is a promising avenue for future research since inflation volatility only explains about a quarter of the cross-country variation. Studying further inflation underreporting for other emerging markets, the key trade-offs, and its implications for all public debt and not only for IL debt issuance is left for future work.

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Appendix

Sample of countries

The sample of countries included in the study is their corresponding regions are the following:

(1) Latin America: Argentina, Brazil, Chile, Colombia, Mexico, Peru

(2) EMEA-UE: Czech Republic, Hungary, Poland

(3) EMEA-non UE Russia, South Africa, Turkey

(4) EMEA-Asia India, Indonesia, Malaysia, Thailand

Data sources and coverage

(1) IL debt issuance and domestic debt issuance: Bank of International Settlements. Table C2. Link: https://www.bis.org/statistics/ secstats.htm. Available at yearly frequency only, 1995-2017.

(2) International debt issuance: Table 12E and in Datastream the codes that follow. Argentina (AGBISIEGR), Brazil (BRBISIEGR), Chile (CLBISIEGR), Colombia (CBBISIEGR), Hungary (HNBISIEGR), India (INDN2AMIA), Mexico (MCBISIEGR), Peru (PEBISIEGR), Poland (POBISIEGR), Russia (RSBISIEGR), South Africa (SABISIEGR), Turkey (TKBISIEGR), Czech Republic (CZBISIEGR), Thailand (THBISIEGR), Malaysia (MYBISIEGR), Indonesia (IDBISIEGR)

(3) CPI and GDP deflator: World Development Indicators (WDI), 1995-2017.

(4) FC bond rate: JP Morgan EMBI+, yield-to-maturity, 1995Q1-2017Q4.

(5) LC bond rate: JP Morgan GBI-EM, yield-to-maturity. End date: 2017Q4. Starting dates: Argentina (2007Q3), Brazil (2002Q1), Chile (2002Q4), Colombia (2005Q1), Czech Republic (2002Q1), Hungary (2001Q1), India (2000Q1), Indonesia (2003Q1), Malaysia (2002Q1), Mexico (2002Q1), Peru (2006Q4), Poland (2001Q1), Russia (2005Q1), South Africa (2000Q1), Thailand (2008Q2), Turkey (2000Q1).

(6) IL bond rate: Barclays, Bloomberg, S&P. Coverage: see Gomez-Gonzalez (2019).

(7) 4 year ahead expected inflation: Focus Economics. Coverage: See Gomez-Gonzalez (2019).

(8) Exchange rate stability: Aizenman et al. (2010).

(9) BPP-based inflation rates minus CPI-based inflation rates: Cavallo and Rigobon (2016).

High IL debt economies			Low IL debt economies		
Country	IL debt over debt	IL debt over LC debt	Country	IL debt over debt	IL debt over LC debt
Argentina	18.4%	34.4%	Czech Republic	0.7%	0.8%
Brazil	18.7%	20.6%	Hungary	1.3%	1.9%
Chile	51.4%	84.4%	India	0.02%	0.03%
Colombia	21.1%	29.9%	Indonesia	0%	0%

Mexico	12.2%	18.6%	Malaysia	0%	0%
South Africa	12.2%	13.6%	Peru	2.6%	6.9%
Turkey	12.3%	15.8%	Russia	1.2%	1.9%
			Thailand	0.07%	0.07%
Average	19.3%	28.3%	Average	0.8%	1.5%

Table 1. IL debt in Emerging Markets (1995-2017)

Dependent variable (y_{it})	α	β
IL debt share	0.78**	18.52**
	(0.30)	(3.71)
LC debt share	63.24***	-29.54**
	(7.36)	(12.15)
LC rate	6.12***	5.35**
	(0.67)	(2.35)
FC debt share	31.79***	1.06
	(7.05)	(9.32)
FC rate	5.40***	2.38
	(0.34)	(1.50)
Inflation (CPI)	7.54***	3.52
	(2.28)	(4.38)
Inflation (GDP deflator)	7.58***	5.07
	(2.19)	(3.91)

Table 2. Estimates of α and β in equations of the form $y_{it} = \alpha + \beta highild_i + \epsilon_{it}$.

Clustered errors are in parentheses. Significance levels: *p<0.1, **p<0.05, ***p<0.01.

Country	LC-IL rate differential	Country	LC-IL rate differential
Argentina	5.0%	Chile	-0.9%
Brazil	1.2%	Colombia	-1.0%
Russia	1.5%	India	-3.1%
South Africa	1.9%	Mexico	-0.1%
Turkey	1.2%	Peru	-2.4%
		Poland	-0.4%
Statistical significance of difference $rdiff_i = \alpha + \beta highLCILdiff_i + \epsilon_i$			
α		β	
-0.88*** (0.06)		3.11*** (0.10)	

Table 3. Average LC-IL rate differentials by country calculated using equation (3). Time coverage depends on country and instrument. See Appendix for sources. In regression results standard errors are in parentheses. Significance levels: *p<0.1, **p<0.05, ***p<0.01.

	(A)	(B)	(C)	(D)
MPD	178.63* (85.29)	225.96*** (70.2)	200.31** (76.34)	217.15*** (62.78)
ERS	-63.31 (37.59)	-51.48* (27.91)		
ERS excl. pegs			-87.62*	-97.97**

			(40.34)	(36.66)
$SD(\pi_{CPI})$	-0.34 (0.26)		-0.34 (0.25)	
$SD(\pi_{Defl})$		-0.42 (0.29)		-0.49* (0.26)
Number of observations	15	16	15	16
R^2	0.50	0.52	0.56	0.61
Adj. R^2	0.37	0.40	0.44	0.51

Table 4. Estimates of equation (5). Standard errors are in parentheses. Significance levels: *p<0.1, **p<0.05, ***p<0.01.

	(A)	(B)
$SD(\pi_{CPI})$	0.07* (0.04)	
$SD(\pi_{Defl})$		0.09 (0.06)
Number of observations	10	11
R^2	0.33	0.20
Adj. R^2	0.25	0.11

Table 5. Estimates of equation (6). Standard errors are in parentheses. Significance levels: *p<0.1, **p<0.05, ***p<0.01.

Country and time period	Difference between true inflation and official statistics	Change in IL debt share
Argentina (2008-2015)	13%	-28.5%
Brazil (2008-2015)	0.6%	5.7%
South Africa (2011-2015)	-0.3%	1%

Table 6. Inflation statistics accuracy and change in IL debt share.

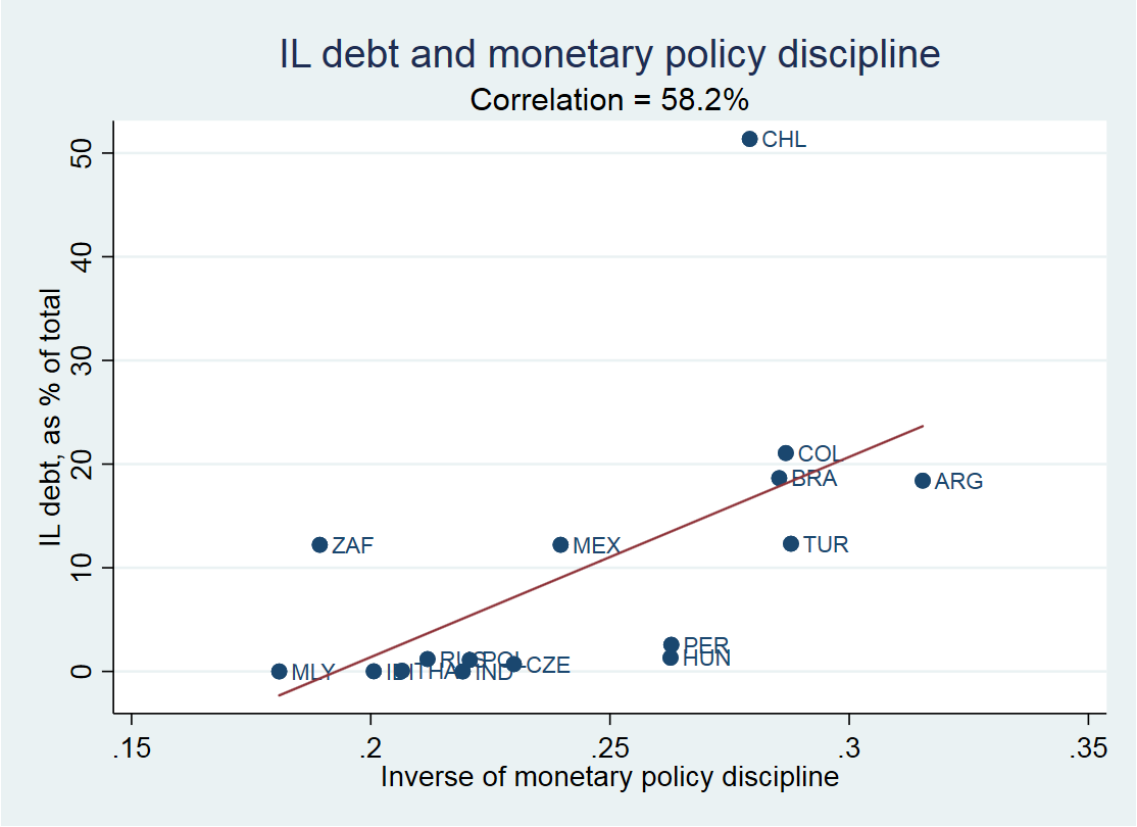

Figure 1. Share of IL debt against the inverse of monetary policy discipline

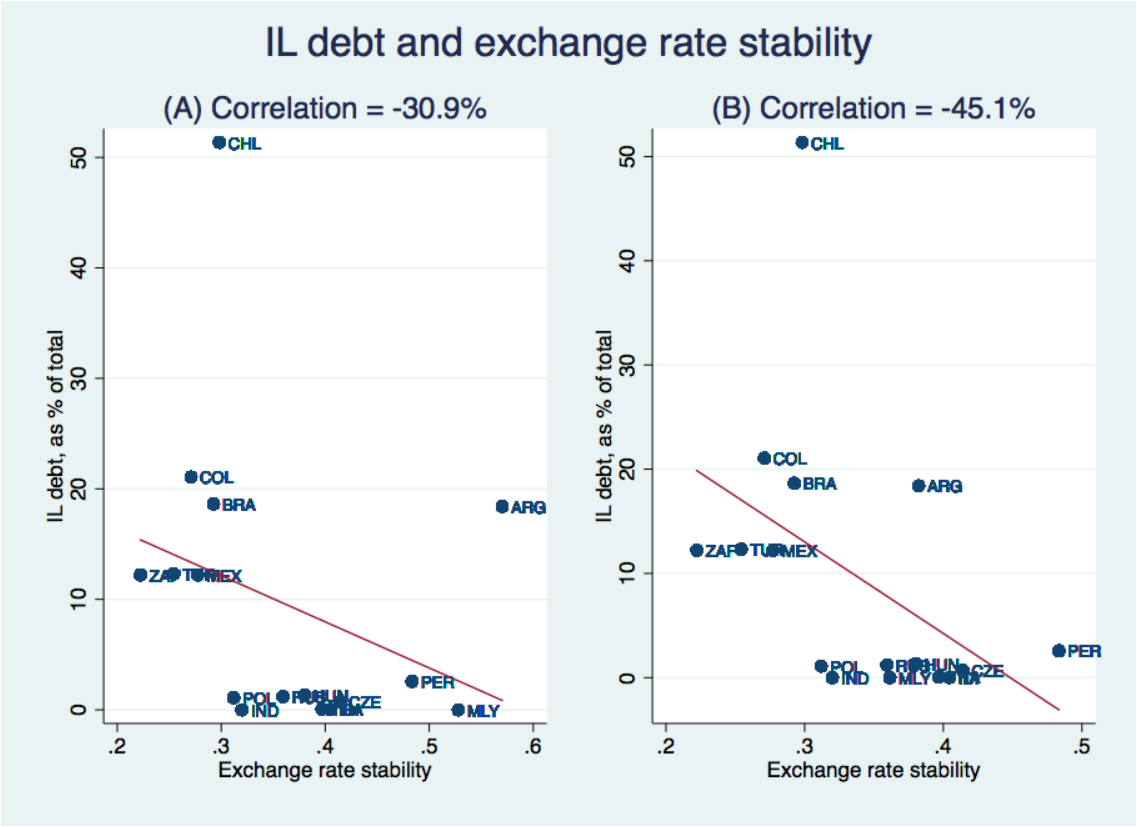

Figure 2. Share of IL debt against exchange rate stability. Panel (A) includes pegs as ones and panel (B) excludes them.

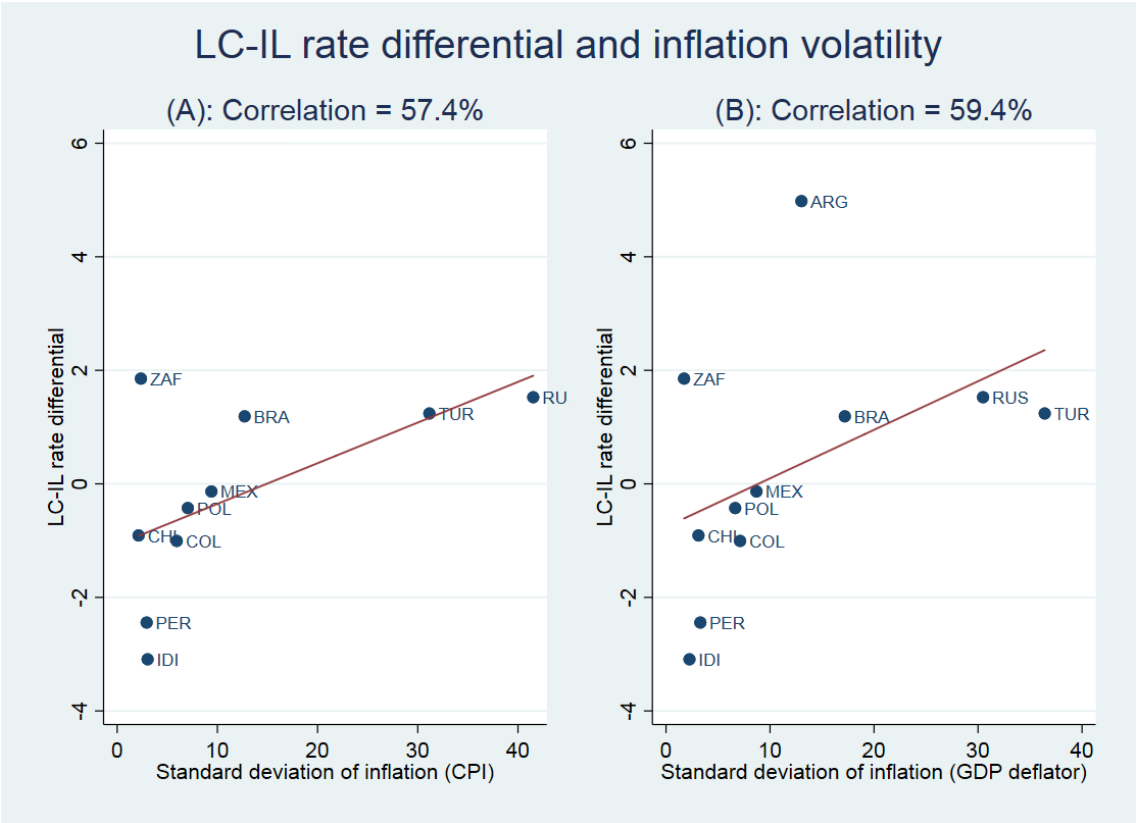

Figure 3. Average rate differential against inflation volatility