

Foreign Currency Debt and Disagreement

FC Debt and Disag.

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Abstract: This paper highlights the disagreement channel of corporate foreign currency (FC) borrowing. In our model, if domestic agents have better information than foreign lenders on the state of the economy, FC borrowing might arise if the fundamentals are strong relative to what public signals suggest to foreigners. In these situations, international markets overestimate future currency depreciation, which increases the cost of borrowing in domestic currency. Domestic agents then borrow more in FC because they disagree with international lenders' pessimistic assessment. This mechanism is consistent with the data: empirically, we show that, controlling for fundamentals, negative public signals are associated with positive domestic currency excess returns and with more FC borrowing.

Keywords: International Lending; Expectations; Debt Currency Denomination

Classification: G15, F34, D83

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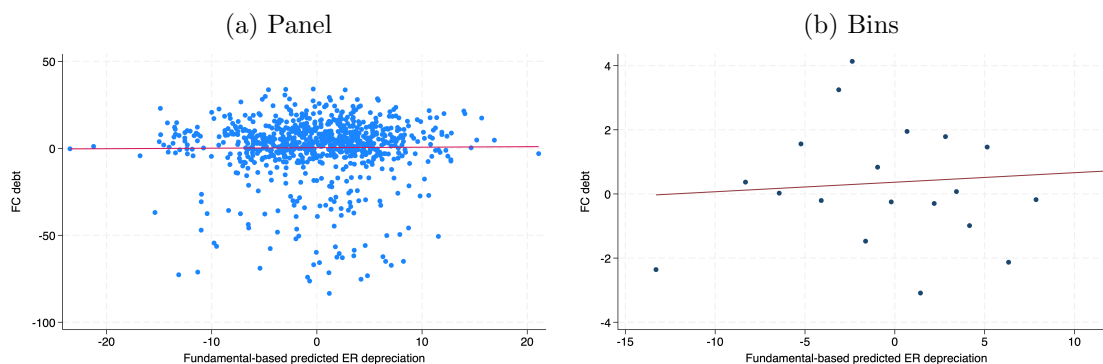
1 Introduction

Foreign currency borrowing by non-financial firms is pervasive in emerging economies. Between 2004 and 2019, the volume of debt denominated in foreign currency issued by non-financial corporations was multiplied by eight (Acharya and Vij, 2024). This phenomenon has given rise to concerns regarding the financial stability of emerging markets, as both firms and the local financial sector are exposed to exchange rate risk (Acharya *et al.*, 2015; Chui *et al.*, 2014; Du and Schreger, 2022).

In this paper, we document a form of “disconnect” between emerging country fundamentals and FC borrowing. This implies that countries with weak fundamentals are as likely as countries with strong fundamentals to have a high share of corporate borrowing denominated in foreign currency. This fact is illustrated in Figure 1. Using a panel of 16 countries over the period Q1-1990 to Q4-2019, we represent the relationship between the share of bonds issued in foreign currency (FC) by the non-financial private sector and the state of the fundamentals measured by the predicted exchange rate depreciation, based on a set of contemporaneous macroeconomic fundamentals.¹ We control for common factors and country-invariant drivers by computing the residuals of a regression with time and country fixed effects. There seems to be no systematic link between FC borrowing and fundamentals. This evidence echoes some results of the literature on original sin, namely, that emerging economies suffer from a negative stigma on international financial markets long after they have improved their fundamentals.² Our paper shows that this disconnect is only apparent and hides a more complex relationship between fundamentals and FC borrowing: FC borrowing is not driven by the fundamentals *per se*, but rather by *disagreement*, i.e., the difference in domestic borrowers versus foreign lenders’ expectations about the economic fundamentals.

¹See Section 3 for more details on how we construct this measure.

²See Hausmann and Panizza (2011). Only country size, proxied by GDP, is correlated with the amount of dollar debt. See Hausmann and Panizza (2003), Bordo and Meissner (2007).

Figure 1. *Foreign currency (FC) debt and fundamental-based predicted exchange rate depreciation*

Source: Bank for International Settlements (BIS) (2019b), International Monetary Fund (2019a), authors' calculations.

Note: The y axis represents the percentage of foreign currency debt issued by the non-financial corporate sector. The x axis represents the predicted exchange rate depreciation. The numbers are the residuals of a regression including time and country fixed effects. The sample includes 16 emerging economies over the period Q1-1990 to Q4-2019. See Section 3 for more details about the data. The left panel shows the raw data while the right panel shows binned data.

We contribute to a better understanding of the sources of FC borrowing by taking into account information asymmetries between foreign and domestic investors and by highlighting a disagreement channel of FC borrowing. In this setting, FC borrowing results from the comparison of the cost of domestic currency borrowing and the cost of FC borrowing, along with borrowers' beliefs about the stability of the domestic currency. Since the cost of domestic currency borrowing reflects international investors' beliefs about the stability of the domestic currency, then, disagreement between foreign creditors and domestic borrowers determines the amount of FC borrowing. As a result, FC borrowing does not derive from fundamentals per se, but from the relative pessimism of international markets and domestic borrowers.

In our model, there is a public signal on the fundamentals, observed by both the domestic and foreign investors. Domestic investors also observe a private signal on the fundamentals. This assumption is justified by the abundant literature documenting the informational advantage of

domestic agents.³ We show that for a given public signal, worse fundamentals lead to *less* dollarization. On the contrary, for given fundamentals, a more negative public signal leads to *more* dollarization. Given that the public signal is correlated with the fundamentals, the unconditional correlation between the fundamentals and FC borrowing is weak, as shown in Figure 1. While the exchange rate is an exogenous function of the fundamentals in the baseline model, we show in an extension that the fact that financial dollarization itself influences exchange rate policies does not influence the results.⁴ We also show that this mechanism does not hinge on a specific assumption on the exchange rate regime.

We test the predictions of the model using a panel dataset covering major emerging market economies. We examine the relationship between the share of bonds issued in foreign currency (FC) by the non-financial private sector and our measure of predicted depreciation, controlling for public signals. We use the exchange rate consensus forecasts from Consensus Economics to proxy for international investors' expected depreciation based solely on the public signal. These forecasts are contemporaneously available to investors, and they are based on contemporaneous information. Conversely, our measure of local borrowers' predicted depreciation is based on an updated information set composed of macroeconomic variables that are made public only ex-post (macroeconomic variables are typically published with a lag). We find that FC borrowing is higher

³The literature has identified the informational advantage in favour of domestic investors as one of the determinants of home bias in asset holdings. French and Poterba (1991) show that agents may choose not to diversify their portfolio internationally because of what they describe as the “familiarity effect”. Tesar and Werner (1995) show that transaction costs associated with trading foreign securities cannot be an explanation to home bias and they conclude that informational constraints can be a determinant of this phenomenon. Brennan and Cao (1997) argue that the observed positive correlation between asset prices and foreign purchases is the effect of an informational disadvantage of international investors. A more recent approach consists in comparing the performance of domestic and international investors in terms of profits earned: “who knows more gets more”. Hau (2001), Choe *et al.* (1999), Dvorák (2005) and Kalem *et al.* (2008), make the case that local investors do better than foreigners. Portes *et al.* (2001); Portes and Rey (2005); Coval and Moskowitz (1999) and Pellegrino *et al.* (Forthcoming), using a gravity approach, emphasise how geographic distance matters in the determination of international portfolio equity transactions. Finally, Benhima and Bolliger (Forthcoming) show that professional forecasters make larger mistakes when forecasting foreign countries' macroeconomic variables.

⁴This gives rise to strategic complementarities among domestic borrowers, in the spirit of the “global games” literature. See Carlsson and Damme (1993), and Morris and Shin (1998, 1999, 2002, 2004).

when the public signals on the fundamentals are negative (when the consensus forecast predicts a currency depreciation) and when the fundamentals are good (when macroeconomic variables predict an appreciation).

In our model, the domestic currency excess return, and domestic and foreign agents' assessments of it, are at the heart of the mechanism. One key question is: whose assessment is better? We show that when the public signals are negative or when the fundamentals are good, which corresponds to situations where FC borrowing increases, the terms of FC debt appear to be more favourable to borrowers, *ex post*: in these situations, the consensus forecasts overestimate future currency depreciation and markets underestimate the effective domestic currency excess return. Additionally, FC debt itself is positively related to future domestic currency excess returns. This evidence is consistent with the disagreement channel and with the assumption that domestic borrowers have an informational advantage.

Importantly, our results hold while controlling for push factors through time fixed effects that account for the leverage and liquidity of global dealers (Maggiore *et al.*, 2020) and the stance of US monetary policy (Bacchetta *et al.*, 2023). Besides, we focus on a homogeneous group of countries in terms of level of economic development and therefore also in terms of the solutions offered to firms to hedge currency risk. In our sample countries, characterized by nascent and still underdeveloped derivatives markets, a previous literature has shown that firms mostly invoice their exports in foreign currency (Gopinath and Stein, 2021; Gopinath *et al.*, 2020). To account for an export-related hedging motive, we control for trade.

The reason why emerging countries borrow in dollars in our model is that international investor pessimism is such that the interest rate charged on domestic currency debt is “unfairly” high

from the borrower point of view.⁵ This channel is consistent with the microeconomic empirical literature. Indeed, the literature on FC-denominated debt emphasises that firms are more likely to borrow in foreign currency with large cross-currency interest differentials and deviations from UIP. Acharya and Vij (2024) finds that interest rate differentials are a strong predictor of foreign currency debt issuance, particularly after the Global Financial Crisis.⁶ Our paper also fits in the wider literature on UIP deviations. As documented by Gourinchas and Tornell (2004), Lustig and Verdelhan (2007), Hassan (2013), Maggiori (2017), Farhi and Gabaix (2015), and Gopinath and Stein (2021), UIP deviations have different possible explanations, including distortions in investors' beliefs, differences in country size and financial development, disaster or consumption risk, and demand for safe assets. In emerging economies, UIP deviations are also explained by global and country-specific risk.⁷ Our contribution is to link these two strands of literature and focus on the relationship between FC borrowing and one specific source of interest rate differentials. We believe that it is particularly important to differentiate between UIP deviations driven by the currency risk premium and those driven by the disagreement channel, because they have different policy implications. In our empirical exercise, we control for this risk channel by including time fixed effects and measures of country risk. We show that the disagreement channel explains domestic currency excess returns and FC borrowing, independently from the risk channel.⁸

⁵Several studies in fact (Amstad and Packer, 2015; Luitel *et al.*, 2016) have shown that emerging countries systematically receive lower ratings than developed economies with similar features.

⁶See also Keloharju and Niskanen (2001), McCauley *et al.* (2015), Brown *et al.* (2011), Brown *et al.* (2014), Brauning and Ivashina (2020), Niepmann and Schmidt-Eisenlohr (2022), Bruno and Shin (2017) and Salomao and Varela (2022). FC borrowing typically responds to global funding conditions on the dollar (Bacchetta and Merrouche, 2021; Bacchetta *et al.*, 2023; Ivashina *et al.*, 2015).

⁷McCauley *et al.* (2015) document a "search-for-yield" due to low short-term interest rates in the U.S. Kalemli-Ozcan and Varela (2019) show that political risk is the key factor underlying the UIP deviations for emerging markets.

⁸A related literature also looks at the role of disagreement (on TFP or GDP growth) in broader classes of investments (FDI, equity,..). See for instance Brennan and Cao (1997) and Benhima and Cordonier (2022).

Our findings echo those of the literature on foreign exchange (FX) trade. In particular, Cespa *et al.* (2021) and Ranaldo and Somogyi (2021) provide empirical evidence that asymmetric information is systematically present in FX markets and that FX volume predicts excess returns. We show that asymmetric information is also relevant at the macroeconomic level since FC borrowing predicts excess returns.

The theoretical literature on FC debt in emerging economies has identified several factors that could explain the choice to borrow in foreign currency: moral hazard created by bailout guarantees (Mckinnon and Pill, 1999; Burnside *et al.*, 2001; Schneider and Tornell, 2004), lack of domestic financial development (Caballero and Krishnamurthy, 2003), commitment problems at the level of domestic firms (Aghion *et al.*, 2004), and domestic monetary policy (Chamon and Hausmann, 2005; Tirole, 2003; Jeanne, 2003; Cowan and Do, 2003; Chang and Velasco, 2006).⁹ Contrary to these papers, we acknowledge the existence of a disconnect between fundamentals and FC borrowing and provide an explanation for that disconnect: disagreement drives FC borrowing, not fundamentals. Another specificity of our approach is that borrowers choose to expose themselves to currency risk. To quote Tirole (2003), "...dangerous forms of debt cannot be presumed to be suboptimal for those who issue them". In other words, while the literature has focused on the "supply side" of FC borrowing (on the ability of domestic agents to borrow in foreign currency), we show that the "demand side" (their willingness to borrow in foreign currency) also plays a role.

The remainder of this paper is organized as follows. Section 2 describes the model and derives testable implications. Section 3 tests the model's implications. Section 4 concludes.

⁹As Chamon and Hausmann (2005) and Chang and Velasco (2006), we emphasise the endogeneity between the currency denomination of the debt and the policy of the central bank.

2 The Model

In this section, we present a stylized model of the currency denomination of debt and derive its empirical implications, highlighting the role of disagreement between domestic borrowers and foreign investors. We first propose a baseline model where the exchange rate dynamics is exogenous. We then extend the model to account for the endogenous determination of the exchange rate, with the inclusion of a strategic central bank, and we discuss the role of the exchange rate regime. We show that our empirical predictions are robust to all the different specifications.

2.1 The Baseline Model

Consider a two-period small open economy populated by a measure-one continuum of domestic agents and a measure-one continuum of foreign investors. Domestic and foreign agents are risk-neutral. In period 1, to finance their production, domestic firms have to borrow on the international markets an amount of debt that we normalize to 1. Firms choose $0 \leq m_i \leq 1$, the share of their debt that is denominated in domestic currency, called *peso*, the rest being denominated in foreign currency, called *dollar*. The supply of funds by foreign investors is infinitely elastic. The cost of borrowing in pesos depends on r , the interest rate on peso debt. The cost of borrowing in dollars depends on the foreign interest rate r^* and on the value of the domestic currency in period 2. For simplicity, r^* is normalized to 0. The initial exchange rate between the dollar and the peso is equal to 1 in period 1, and to S in period 2.

We assume, without loss of generality, that the exchange rate can only take two values in period 2, as in a fixed exchange rate regime. In the absence of a devaluation, $S = 1$ and the agent who borrows in dollars has a net cost of debt equal to 0 in period 2. A devaluation in period 2, instead, implies that $S = 2$ (two pesos are exchanged for one dollar) and the net borrowing cost in terms

Table 1. *Cost of debt*

	Devaluation	No devaluation
Dollar debt	1	0
Peso debt	r	r

of pesos becomes 1. The agent that borrows in pesos instead has a cost of debt equal to r . The borrowing costs are summarised in Table 1.

The exchange rate We assume that the exchange rate is an ad hoc function of the exogenous fundamentals θ . A devaluation happens if and only if:

$$\theta \leq \theta^*. \tag{1}$$

where θ^* is a constant cut-off point. A devaluation happens ($S = 2$) if fundamentals are weak and θ is below the cut-off θ^* . There is no devaluation ($S = 1$) if the fundamentals are strong and θ is above the cut-off. In an extension of the model, the exchange rate will depend on the endogenous decisions of the central bank. We will also examine a version of the model where the central bank follows a flexible exchange rate regime and S can take continuous values.

Information and timeline The fundamentals θ are assumed not to be common knowledge. At time 1, domestic and foreign agents observe a public signal about the state of the fundamentals, denoted by $\mu = \theta + \sqrt{\alpha}^{-1}\lambda$, with $\lambda \sim N(0, 1)$. Each domestic firm i has access to a second source of information represented by a private signal $x_i = \theta + \sqrt{\beta}^{-1}\epsilon_i$. The error term ϵ_i is normally distributed over the population of borrowers with mean 0 and variance 1, $\epsilon_i \sim N(0, 1)$. The parameters α and β represent the precisions of the public and private signals, respectively.

Strategies and Equilibrium Analysis As foreign investors are risk-neutral and the supply of funds is infinitely elastic, the interest rates on peso and dollar debt must satisfy the uncovered interest parity (UIP):

$$r_t = r_t^* + E_t(dS_{t+1}|\mu), \quad (2)$$

where $E_t dS_{t+1}$ indicates the expected depreciation rate, from the point of view of foreign investors. This expectation is conditional on μ , which is the only signal they receive. The left-hand-side represents the return on peso debt, expressed in pesos, while the right-hand-side represents the investors' expectation about the return on dollar debt, also expressed in pesos.

The expected depreciation rate is 1 ($dS = \frac{2-1}{1}$) if the fundamentals are smaller than θ^* and 0 ($dS = \frac{1-1}{1}$) otherwise. Therefore, the expected depreciation rate $E_t(dS_{t+1}|\mu)$ is simply equal to the devaluation probability: $E_t(dS_{t+1}|\mu) = 1 * Pr(\theta \leq \theta^*|\mu) + 0 * Pr(\theta \geq \theta^*|\mu) = Pr(\theta \leq \theta^*|\mu)$. With the dollar interest rate r^* normalized to zero, the UIP condition implies that the interest rate charged on peso debt is equal to the foreign investors' subjective devaluation probability, which is conditional on the public signal μ :

$$r = Pr(\theta \leq \theta^*|\mu), \quad (3)$$

When choosing her borrowing strategy, a borrower compares the expected cost of dollar debt from *her* point of view, which, following similar arguments, is equal to the probability of devaluation given her information set (μ, x_i) , $Pr(\theta \leq \theta^*|\mu, x_i)$, with the cost of peso debt r . It is optimal for the borrower to dollarize her debt when her expected cost of dollar debt is lower than the cost of peso debt, that is, when her devaluation probability is lower than the peso interest rate. On the contrary, when the borrower's probability of devaluation is higher than the peso interest rate, it is optimal for her to denominate her debt in pesos. When the probability of devaluation coincides

with the domestic interest rate, the borrower is indifferent between dollarizing or not. The optimal share of peso debt $m_i(x_i, \mu)$ is therefore symmetric ($m_i(x_i, \mu) = m(x_i, \mu)$) and is as follows:

$$m(x^i, \mu) = \begin{cases} 0 & \text{if } Pr(\theta \leq \theta^* | \mu, x_i) < r \\ [0, 1] & \text{if } Pr(\theta \leq \theta^* | \mu, x_i) = r \\ 1 & \text{if } Pr(\theta \leq \theta^* | \mu, x_i) > r \end{cases}$$

Note that, effectively, the borrower compares her devaluation probability $Pr(\theta \leq \theta^* | \mu, x_i)$ with international the investors' probability $Pr(\theta \leq \theta^* | \mu)$. Note also that, even though UIP holds from the foreigner point of view, the domestic borrower choice reflects individual deviations from UIP.

Consequently, for a given interest rate r , there exists a unique threshold $x^*(\mu)$ that makes a domestic agent indifferent between borrowing in pesos or in dollars:

$$r = Pr(\theta \leq \theta^* | \mu, x^*(\mu)). \quad (4)$$

Using the UIP condition (3), the indifference condition (4) reduces to the equality between the international investors' devaluation probability and that of the marginal domestic borrower:

$$Pr(\theta \leq \theta^* | \mu) = Pr(\theta \leq \theta^* | \mu, x^*(\mu)). \quad (5)$$

$x^*(\mu)$ is the private signal that makes a domestic agent form the same expectations as foreigners. An agent borrows in pesos if and only if the realisation x_i of the private signal is less than the threshold $x^*(\mu)$. All agents who receive more pessimistic private signals than this marginal borrower borrow in pesos. All those that receive a more optimistic signal borrow in dollars.

As a result, the share of peso debt is given by the proportion of agents that observe a private signal x smaller than the threshold $x^*(\mu)$:

$$M(\theta, \mu) = Pr(x < x^*(\mu)|\theta), \quad (6)$$

It is useful to define the threshold for the private signal noise as $\epsilon^*(\theta, \mu)$, where $\epsilon^*(\theta, \mu) = \sqrt{\beta}(x^*(\mu) - \theta)$, so that $x_i < x^*(\mu)$ is equivalent to $\epsilon_i < \epsilon^*(\theta, \mu)$. Since ϵ_i is independent of θ and μ , Equation (6) implies that the share of peso debt is monotonously related to $\epsilon^*(\theta, \mu)$:

$$M(\theta, \mu) = Pr(\epsilon_i \leq \epsilon^*(\theta, \mu)) = \Phi(\epsilon^*(\theta, \mu)) \quad (7)$$

where Φ denotes the cumulative distribution function for the standard normal. A higher threshold $\epsilon^*(\theta, \mu)$ means that more agents choose to borrow in pesos.

The indifference equation (5) characterizes $\epsilon^*(\mu, \theta)$ uniquely. It can be rewritten as:¹⁰

$$\Phi[\sqrt{\alpha}(\theta^* - \mu)] = \Phi\left[\sqrt{\alpha + \beta}\left(\theta^* - \frac{\alpha}{\alpha + \beta}\mu - \frac{\beta}{\alpha + \beta}\left(\theta + \sqrt{\beta}^{-1}\epsilon^*(\theta, \mu)\right)\right)\right] \quad (8)$$

The left-hand side is the foreign investors' subjective devaluation probability (and equilibrium interest rate on peso debt), while the right-hand side is the marginal domestic borrower's subjective devaluation probability. We can see that the public signal μ has a smaller effect on the marginal borrower's expectations than on the investors'. On the opposite, the marginal borrower's expectations react to the fundamentals θ , while the foreign expectations do not. This is because, for a given

¹⁰We use

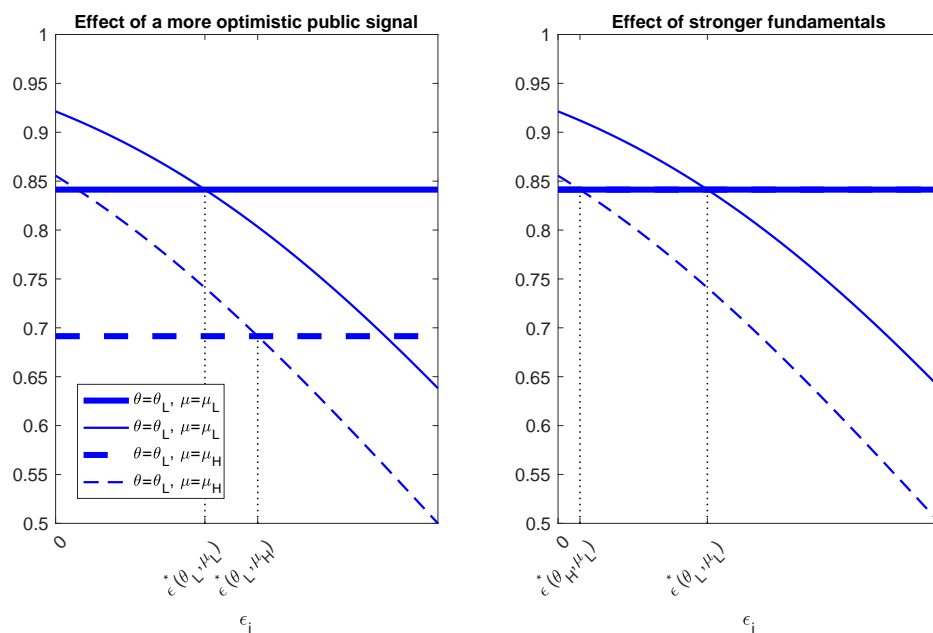
$$Pr(\theta \leq \theta^*|\mu) = \Phi(\sqrt{\alpha}(\theta^* - \mu))$$

and

$$Pr(\theta \leq \theta^*|\mu, x^*(\mu)) = \Phi\left(\sqrt{\alpha + \beta}\left(\theta^* - \frac{\alpha}{\alpha + \beta}\mu - \frac{\beta}{\alpha + \beta}x^*(\mu)\right)\right).$$

public signal μ that all agents observe, domestic borrowers have an extra source of information (the private signal) on the fundamentals θ . This will determine the equilibrium effect of the public signal μ and of the fundamental θ on the marginal signal (equivalently, on $\epsilon^*(\theta, \mu)$) and, consequently, on the share of peso debt M .

Figure 2. *Cut-off value for ϵ_i*



This figure represents the foreigner devaluation expectation (thick lines), against the domestic investor devaluation expectations as a function of ϵ_i , (thin lines). The intersection between these two lines gives ϵ^* ; the cutoff value for ϵ_i . If $\epsilon_i < \epsilon^*$, then investor i is relatively more pessimistic than the foreign investors and borrows in domestic currency. If $\epsilon_i > \epsilon^*$, then investor i is relatively more optimistic than the foreign investors and borrows in foreign currency. The figure is based on the following parametrization: $\theta^* = 1.5$, $\theta_L = 0.5$, $\theta_H = 1$, $\mu_L = 0.5$, $\mu_H = 1$, $\alpha = \beta = 1$.

Consider Figure 2, which represents the foreign and domestic depreciation expectations, for given θ and μ . The flat thick lines represent foreigners' depreciation expectations. The decreasing thin lines represent the domestic borrowers' expectations as a function of ϵ_i , which measures the

optimism of the private signal. These expectations are equal when $\epsilon_i = \epsilon^*(\theta, \mu)$. For values of ϵ_i below the cut-off point, the domestic agents issue peso debt, while they issue dollar debt for larger values.

Consider first the left panel and suppose that μ increases from μ_L to μ_H , so that agents receive a more optimistic public signal, while fundamentals θ remain the same (this happens through a change in the noise λ , since $\mu = \theta + \sqrt{\alpha}^{-1}\lambda$). This decreases both foreign and domestic depreciation expectations, as shown by the thick and thin dashed lines. However, since foreign expectations react relatively more to the public signal, the more favourable conditions on the peso are not fully offset by the increased confidence of domestic borrowers in the stability of their currency, and more domestic agents then borrow in pesos. As a result, the threshold $\epsilon^*(\theta, \mu)$ increases, which means that the share of dollar borrowing declines.

Now, consider the right panel and suppose that θ increases from θ_L to θ_H , for a given public signal μ (λ must compensate for the change in θ). Domestic agents revise their expectations, thanks to the extra information coming from their private signals, while foreign expectations do not change. This results in a reduction of the threshold $\epsilon^*(\theta, \mu)$ and an increase in the share of dollar debt. More domestic agents borrow in dollars because they are relatively more confident about the stability of the peso.

We establish the following proposition that summarises these effects:

PROPOSITION 1. From the indifference and peso share equations (8) and (7), we can show:

$$\frac{\partial M(\theta, \mu)}{\partial \theta} = -\sqrt{\beta}\phi(\epsilon^*(\theta, \mu)) < 0 \quad \text{and} \quad \frac{\partial M(\theta, \mu)}{\partial \mu} = A\phi(\epsilon^*(\theta, \mu)) > 0$$

with $A = \sqrt{\alpha}(\sqrt{\alpha + \beta} - \sqrt{\alpha})/\sqrt{\beta}$ and ϕ denotes the probability distribution function for the standard normal.

Proof. We apply the strictly monotonic transformation Φ^{-1} to both sides of Equation (8), then rearrange to obtain the formula for ϵ^* : $\epsilon^*(\theta, \mu) = A(\mu - \theta^*) - \sqrt{\beta}(\theta - \theta^*)$. We then substitute ϵ^* in (7) and take the derivative with respect to θ and μ . \square

An increase in the fundamentals θ reduces the share of peso debt M , while a more optimistic public signal, μ , increases the share of peso debt M , consistently with our graphical analysis. Note that, contrary to common wisdom, debt dollarization is not caused by weak fundamentals, but rather by negative public signals on the fundamentals. This is because in our model, dollar debt issuance is an equilibrium outcome that arises from the relative assessment of domestic and foreign agents regarding the state of the economy. Weak fundamentals make domestic agents less confident than foreign investors. On the contrary, weak signals negatively affect foreign investors' confidence.

FC borrowing arises because the majority of domestic borrowers are more optimistic than foreigners on the stability of the peso and expect the cost of dollar debt to be relatively low. What about the effective cost? For given fundamentals, and hence a given exchange rate S , a more pessimistic signal (a lower μ) leads to a higher peso interest rate r . A more pessimistic signal is therefore associated with a higher peso excess return $r - (S - 1)$. Thanks to their informational advantage, domestic agents are more likely to denominate their debt in dollars when the dollar is actually cheaper.

Discussion These implications derive crucially from our assumption that domestic borrowers have an informational advantage over foreign investors. Otherwise, our predictions would be reversed. Strong fundamentals would generate more optimism among foreign investors than among domestic borrowers, so that the former would be more willing to lend in pesos. On the contrary, a positive

signal would drive more optimism among domestic borrowers than among foreign investors, leading to less peso borrowing.

Another crucial feature of the model is that no equilibrium variable reveals the state of the demand for peso debt to investors. Otherwise, disagreement between foreign and domestic agents would not persist in equilibrium. This is due to two key assumptions.

First, the small open economy assumption implies that equilibrium prices (here the cost of peso debt r) do not reveal the borrowers' private information to foreign investors. Indeed, since the supply of funds by the foreigners is infinitely elastic, any r that deviates from *their* assessment of the fundamentals cannot be an equilibrium. In a more general model, deviating from the small open economy assumption would make r react to private information. For instance, if the supply of peso debt was imperfectly elastic, then the equilibrium price would reveal the state of demand to foreign investors, therefore revealing θ . However, the small open economy assumption is a realistic one given the set of emerging economies that we consider in our empirical analysis. Moreover, asset prices are typically noisy, making them imperfectly revealing, even if we deviate from the small open economy assumption. For instance, in the case of FC debt, the risk premium can also be driving the data (as we argue in the empirical section). It is also commonly assumed that "noise" traders can make equilibrium prices noisy.

Second, foreign investors do not observe the aggregate share of peso borrowing M . If they did, M would actually reveal the domestic private information since, as Equation (6) shows, it depends in equilibrium on μ but also on θ . The assumption that quantities are not observed, we believe, is a realistic assumption because macroeconomic variables, including the FC composition of debt, are

typically revealed with a lag.¹¹ Besides, just like prices, aggregate variables can be noisy and thus not fully revealing.

2.2 The Role of a Strategic Central Bank

So far, we have treated exchange rate dynamics as exogenous. However, in reality, the value of the exchange rate is decided by the central bank, and the central bank decision could be influenced by the share of FC debt. Indeed, in emerging markets, firms' exposure to currency risk is substantial, and a large literature has shown that currency mismatch makes exchange rate depreciations more costly.¹²

We consider here an extended model where the central bank (CB) chooses the value of the exchange rate ($S = 1$ or 2) in order to maximize households' welfare, where households' welfare depends on the deviation of the exchange rate from some fundamental value, but also on the effective cost of borrowing. This makes the exchange rate dynamics endogenous. We develop the full extended model in Appendix A.1 and focus here on the main results.

In that case, a depreciation is more costly if the share of dollar debt is high. A devaluation ($S = 2$) is thus more likely when the share of peso debt $M(\theta, \mu)$ in the economy is relatively high and the fundamentals are relatively weak. This gives rise to strategic complementarities between domestic borrowers. If an individual domestic borrower expects other domestic borrowers to borrow in dollars, then her expectations of a depreciation will go down, increasing her incentive to borrow in dollars.

¹¹For instance, the data source that we use to compute the share of FC debt (the BIS International debt securities) releases information with a one-quarter lag.

¹²See for instance Bebczuk *et al.* (2010) or Barajas *et al.* (2017). In 2023, credit to non-financial corporations represented 66,69 percent of GDP in Emerging markets, according to the BIS statistics online. Avdjiev *et al.* (2024) show that less than 50% of corporate debt is denominated in foreign currency in 2019, and that this share has been growing over time. These figures suggest that the exposure of firms' balance sheet to exchange rate risk is of relevance to the central bank.

We show in Appendix A.1 that the problem is the same as before, with the only exception of the policy rule. A depreciation occurs if and only if

$$\theta \leq \theta^*(\mu) \tag{9}$$

where $\theta^*(\mu)$ is characterized in the Appendix. This policy rule is similar to (1), except that the threshold is endogenous and depends on the public signal. When borrowers observe a pessimistic public signal, they borrow more in dollars, which reduces the CB's incentives to devalue the currency.

It is possible to derive the following proposition:

PROPOSITION 2. We can show:

$$\frac{\partial M(\theta, \mu)}{\partial \theta} = -\sqrt{\beta}\phi(\epsilon^*(\theta, \mu)) < 0 \quad \text{and} \quad \frac{\partial M(\theta, \mu)}{\partial \mu} = Z(\mu)A\phi(\epsilon^*(\theta, \mu)) > 0$$

where $Z(\mu) > 1$ is a multiplier term.

Proof. See proof in Appendix A.1.4 □

The effect of θ and μ on the share of peso debt are same as in the baseline model, up to a multiplier term in the case of μ . The fact that this multiplier, $Z(\mu)$, is larger than 1 reflects an amplification effect due to strategic complementarities. Take for example the effect of a weaker signal. A deterioration $\partial\mu$ in the signal, for a given central bank strategy, increases the interest rate on peso debt, which leads domestic agents to borrow more in dollars. However, more dollarization increases the incentives of the central bank to defend the currency, which is reflected in the decrease of the devaluation cutoff. Furthermore, as the agents know this, they increase their dollar borrowing

even further: the dollarization cutoff decreases by an additional amount. These feedback effects accumulate, so that the dollarization cutoff ϵ^* decreases by an amount greater than the baseline.

2.3 The Role of the Exchange Rate Regime

We have consider so far a fixed exchange rate regime. Our results do not hinge on that assumption. In Appendix A.2, we discuss an extension where the CB pursues a flexible exchange rate policy by setting the second-period exchange rate S flexibly, with the same signal structure and equilibrium concept. The difference with the fixed exchange rate case is that domestic borrowers and international investors compare directly their expectations of θ , while in the fixed exchange rate case they compare their subjective devaluation probability, which is a non-linear function of θ .

We show that changes in θ , keeping μ constant, and changes in μ , keeping θ constant, have the same qualitative effect as in the main model with a fixed exchange rate. This is intuitive, as the borrowing decision of the domestic agents relies on their assessment of the fundamentals relative to that of the foreigners, and domestic agents still have an informational advantage when assessing the fundamentals.

3 Empirical Analysis

In this section, we provide empirical evidence that is consistent with the two predictions derived from our model:

1. Weaker fundamentals decrease the share of dollar borrowing, for a given public signal.
2. Given the state of the fundamentals, a negative public signal increases the share of dollar borrowing.

3.1 Data

To test our predictions, we need data on FC borrowing, macroeconomic fundamentals, and a public signal. We construct a quarterly database for a set of emerging economies over the period Q1-1990 to Q4-2019.¹³

Our baseline measure of FC borrowing comes from the Bank for International Settlements (BIS) (2019b)' International Debt Securities Statistics. They include new bonds issued on the international market and aggregated across all maturities, by country and by year-quarter. The international market is more relevant for our analysis because it is characterized by an active participation of both foreign lenders and domestic borrowers, while domestic markets are dominated by domestic investors. For our analysis, we consider as main dependent variable the proportion of bonds denominated in foreign currency (mostly dollars) issued by the private non-financial sector. This allows us to circumvent the issue of prudential restrictions imposed on financial firms (banks) to limit their borrowing in foreign currency. We obtain 1147 country-quarterly observations, of which 324 observations with both local and foreign currency issued. Across countries, foreign currency borrowing varies from 72 percent on average in South-Africa to almost 100 per cent in Chile and in the Philippines.

As an alternative source of data, we use the SDC Platinum (2019) bond data, as aggregated by Bacchetta *et al.* (2023). These data cover both the domestic and the international market and provide information on the maturity of the instruments issued. Given that 70% of total debt and 82% of foreign currency debt issued have a maturity of at least five years, we compute the proportion of bonds denominated in foreign currency, aggregated by country-quarter, with a maturity of at least five years. This ratio serves as an alternative dependent variable in our analysis. The sample

¹³The countries in our sample are Argentina, Brazil, Chile, China, Colombia, India, Malaysia, Mexico, Peru, Pakistan, the Philippines, Poland, Russia, South Africa, Thailand, Turkey and Ukraine.

mean of this alternative dependent variable is 51% and the standard deviation 43%. This measure provides more variation in currency denomination than our baseline measure. However, including local markets brings its own limitations, since a lot of the transactions happen between domestic agents. These transactions do not reflect information asymmetries between domestic and foreign agents. This is why we do not consider this variable in our baseline specification. Besides, as we will see below, our baseline measure exhibits some degree of variability over time that we can exploit for identification.

We collect data on various fundamentals that are susceptible to be relevant drivers of the exchange rate. We follow the literature in our choice of fundamentals: real GDP growth, international reserves, the current account, the government primary balance, and exchange market pressure (EMP).¹⁴ These variables are sufficiently populated and most tend to be published at low frequencies and with a lag, and are thus not contemporaneously available. These data come from the International Monetary Fund (2019a) International Financial Statistics and the International Monetary Fund (2019b) World Economic Outlook, with the exception of EMP, which comes from Desai *et al.* (2017). International reserves, the current account and the government primary balance are computed as fractions of GDP. EMP, expressed in percentage change in exchange rate, measures the observed current change in exchange rate or, in case of central bank interventions, the change in exchange rate that would have taken place had the central bank not intervened, which is measured by a weighted average of the change in international reserves and the change in interest rate (Desai *et al.*, 2017). The nominal exchange rate vis-à-vis the US dollar is collected from the IMF International Financial Statistics database.

¹⁴The literature considers a menu of fundamentals that comprises the standard monetary fundamentals most commonly used since Mark (1995), along with other variables suggested by exchange rate determination theories, including net foreign assets, interest rates, the trade balance, and lagged values of exchange rate changes. See for instance Andersen *et al.* (2003) and Abhyankar *et al.* (2005).

Finally, we use the consensus exchange rate forecast data published by Consensus Economics (2019) as our proxies for the public signals. Consensus forecasts are based on a survey of professional forecasters conducted every month. Even though these forecasts are not public in the strict sense since they incur a fee, they are the closest measure to the exchange rate expectation that agents can form based on contemporaneous information.¹⁵

Table B.1 in the Appendix reports descriptive statistics of our data. Our sample is unbalanced, countries enter the BIS statistics at different dates and consensus forecast data tend to be more frequently available starting in the 2000s. On average, 92 percent of the bonds issued in the international markets are denominated in foreign currency. This high average is driven by large amounts of dollar bonds issued in the period following the Global Financial Crisis (Bacchetta *et al.*, 2023) and hides a significant variability in the cross-section and time series over the thirty years covered by our sample. The standard deviation of the proportion of bonds issued in dollar is high at 20 percent. Our sample period is sufficiently long to cover several business cycles, implying that the macroeconomic variables also display a lot of variability, both across countries and over time. The range of expected depreciation is also wide, from -8.7% to 40% for the 8-quarter-ahead expectation, which has the widest range. In Table B.2 in the Appendix, we provide a correlation matrix of all the variables.

3.2 Empirical strategy

Our empirical strategy proceeds in two steps. First, we build a synthetic measure of fundamentals and a synthetic measure of the public signals. To do so, we construct two measures of predicted

¹⁵The identity of the forecasters at the origin of the consensus exchange rate forecasts is not disclosed by Consensus Economics, contrary to the other macroeconomic forecasts. Benhima and Bolliger (Forthcoming) show that most of the forecasters that provide forecasts for macroeconomic variables like GDP growth and inflation for emerging economies are foreign. Note that, even if some of the information aggregated in these forecasts has a private origin, it becomes public once it is made available to all agents.

exchange rate depreciation: a measure based on economic fundamentals and a measure based on Consensus Economics' professional forecasts. We then use the results obtained in the first step to test predictions (1) and (2).

Fundamental-based Predicted Depreciation To estimate the exchange rate change predicted by the fundamentals, we use the following specification:

$$\Delta s_{t,t+h} = c + F_{it}\beta + \gamma_t + \alpha_i + \epsilon_{it}, \quad (10)$$

where s is the logarithm of the spot exchange rate expressed as the price of US dollars in terms of domestic currency (International Monetary Fund, 2019a), F is the vector of fundamental macroeconomic variables, c is a constant, and γ_t and α_i are time and country fixed effects. $\Delta s_{t,t+h}$ is the depreciation rate of the domestic currency vis-à-vis the dollar. We consider the 8-quarter, 4-quarter and 1-quarter horizons ($h = 8, 4, 1$).

The results of the estimation of Equation (10) for $h = 8, 4, 1$ are reported in Table 2. Weaker fundamentals are associated with a significant future depreciation of the domestic currency. Precisely, the currency depreciates with lower growth, scarcer international reserves, a higher current account balance (i.e. higher capital outflows), a lower government primary balance, and a higher exchange market pressure. The latter is not significant for the longer-term 8-quarter-ahead depreciation, while the “real” fundamentals (GDP growth, reserves, the current account and the government balance) are not significant in the shorter-term 1-quarter-ahead depreciation. The lack of predictive power of real variables in the short term echoes the famous “exchange rate disconnect” (Meese and Rogoff, 1983).¹⁶ All in all, the relevance of these fundamentals depends on the horizon. We use

¹⁶Importantly, we are not performing a forecasting exercise here, contrary to Meese and Rogoff. If we were to perform a forecasting exercise, we would use real-time data, which would mimic the Consensus forecasts. Instead we mimic predictions that are based on the private information that is available to domestic agents.

Table 2. *First stage: predicting the exchange rate depreciation*

	(1)	(2)	(3)
VARIABLES	$\Delta S_{t,t+8}$	$\Delta S_{t,t+4}$	$\Delta S_{t,t+1}$
Growth	-6.702*** (1.948)	-5.368*** (1.935)	-1.098 (0.784)
Reserves	-0.309** (0.143)	-0.207** (0.095)	0.002 (0.035)
Current account	-1.969** (0.764)	-0.330 (0.544)	-0.223 (0.268)
Gov. primary def.	-0.578 (0.430)	-0.215 (0.263)	0.058 (0.113)
EMP	0.287 (0.243)	0.413** (0.184)	0.498*** (0.102)
Observations	744	787	795
R-squared	0.559	0.508	0.468
Time FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: The dependent variable is the log change of the nominal exchange rate vis-à-vis the US dollar; a higher value indicates a higher depreciation of the domestic currency.

specification (1) in Table 2 to define the predicted exchange rate depreciation, as follows:

$$\widehat{\Delta s}_{t,t+h} = \hat{c} + F_{it}\hat{\beta} + \hat{\gamma}_t + \hat{\alpha}_i \quad (11)$$

$\widehat{\Delta s}_{t,t+h}$ then constitutes our synthetic measure of fundamentals relevant for horizon h . Given that foreign currency debt spans several maturities, we extract the first principal component of these three measures, which we denote $PC1(\widehat{\Delta s}_t)$ and label the “fundamental-based predicted depreciation”.

Survey-based Predicted Depreciation To measure the exchange rate change predicted by public signals, we use the Consensus Economics quarterly average of the contemporaneous expected depreciation vis-à-vis the US dollar over the next 24 months (8 quarters), 12 months (4 quarters) and 3 months (1 quarter), which we denote respectively by $E_t(\Delta s_{t,t+8}^j)$, $E_t(\Delta s_{t,t+4}^j)$ and $E_t(\Delta s_{t,t+1}^j)$, where j is the country index and t is the time index (at the quarterly frequency), and $\Delta s_{t,t+h}^j = s_{t+h} - s_t$ is the depreciation rate of the domestic currency. Here as well, we do not take a stand on which horizon is the most relevant for FC borrowing, so we extract the first principal component of these 3 variables and use it as a synthetic public signal measure. We denote it $PC1(E_t(\Delta s_t^j))$ and call it the “survey-based predicted depreciation”.

Interestingly, consensus exchange rate forecasts are also good predictors of changes in the value of the currency, as shown in columns (1) to (3) of Table B.3 in the Appendix, except for the 1-quarter horizon. Last, the size of the estimated consensus forecast coefficients declines when we add fundamentals to the regression, as shown in columns (4) to (6), but remains significant. This shows that our set of fundamentals is relevant, but is missing some of the contemporaneous information

used to produce the forecasts. This is not surprising since we are using a parsimonious set of fundamentals.

Testing the model’s predictions In a second step, we test predictions (1) and (2) using the following specification:

$$fs_{it} = c + \beta_1 PC1(\widehat{\Delta s}_t) + \beta_2 PC1(E_t(\Delta s_t)) + X_{it}\beta_3 + \gamma_t + \delta_i + \epsilon_{it} \quad (12)$$

Where fs is the proportion of newly issued bonds denominated in foreign currency, $PC1(\widehat{\Delta s}_t)$ and $PC1(E_t(\Delta s_t))$ are respectively the fundamental-based and the survey-based predicted exchange-rate depreciations, as explained above, X are control variables and γ_t and δ_i are respectively time and country fixed effects. Time fixed effects control for global supply factors such as the leverage and liquidity of global dealers and the stance of US monetary policy. Country fixed effects control for other demand factors that tend to be time-invariant within country (over our sample period) such as the level of dollarization and the availability and use of hedging instruments. $PC1(\widehat{\Delta s}_t)$ is a measure of “fundamentals” (a higher value means poorer fundamentals) and $PC1(E_t(\Delta s_t))$ is a measure of a “public signal” (a higher measure means a more negative signal). The predictions of our model suggest that β_1 should be negative (prediction (1)) and β_2 should be positive (prediction (2)).

In column (1) of Table 3, we report the unconditional effect of the fundamental-based measure. Consistently with the literature and with our preliminary evidence on the FC debt disconnect from fundamentals shown in Figure 1, we find no significant effect. In column (2), we do the same for the survey-based measure. The coefficient is positive suggesting that when forecasters anticipate a

Table 3. *Explaining the propensity to borrow in foreign currency*

	(1)	(2)	(3)	(4)	(5)
VARIABLES	fs	fs	fs	fs	fs
$PC1(\widehat{\Delta S}_t)$	-0.983 (1.102)		-2.051* (1.151)	-3.075** (1.393)	-4.419*** (1.528)
$PC1(E_t(\Delta S_t))$		0.578 (0.412)	1.177** (0.467)	1.240** (0.597)	1.257* (0.642)
Pol. Risk				0.484 (1.716)	1.404 (1.723)
XR Risk				-0.331 (0.443)	-0.238 (0.438)
SD(EER)				1.552** (0.624)	1.787*** (0.623)
Chin-Ito Index				-0.585 (1.065)	-0.785 (1.120)
Trade balance				1.714* (0.950)	4.569*** (1.502)
Current account					-4.431*** (1.675)
Reserves					-0.087 (0.204)
Lagged fs				0.044 (0.055)	0.033 (0.054)
Observations	814	943	750	609	609
R-squared	0.241	0.249	0.258	0.278	0.287
Time FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Note: The dependent variable is the percentage of new debt obligations issued by the private sector denominated in foreign currency. $PC1(\widehat{\Delta S}_t)$ is the first principal component of the fundamental-based predictions of exchange-rate depreciation $\{\widehat{\Delta s}_{t+h,t}\}_{h=1,4,8}$; a higher value indicates a higher predicted depreciation of the domestic currency. $PC1(E_t(\Delta S_t))$ is the first principal components of the consensus exchange rate depreciation forecasts $\{E_t(\Delta s_{t+h,t})\}_{h=1,4,8}$; a higher value indicates a higher predicted depreciation of the domestic currency. The regressions include time fixed effects and regional fixed effects.

depreciation, domestic firms borrow relatively more in foreign currency. Both coefficients have the anticipated signs, but they are insignificant. However, these are the unconditional effects.

When the two variables are introduced together in the regression, they become both larger and significant, as shown in column (3). We thus find that, conditional on public signals, FC borrowing re-connects with the fundamentals. The sign of the coefficient of the fundamental-based measure is in line with our prediction and contradicts common wisdom: poorer fundamentals (a higher fundamental-based expected depreciation) lead to less FC borrowing, not more.¹⁷

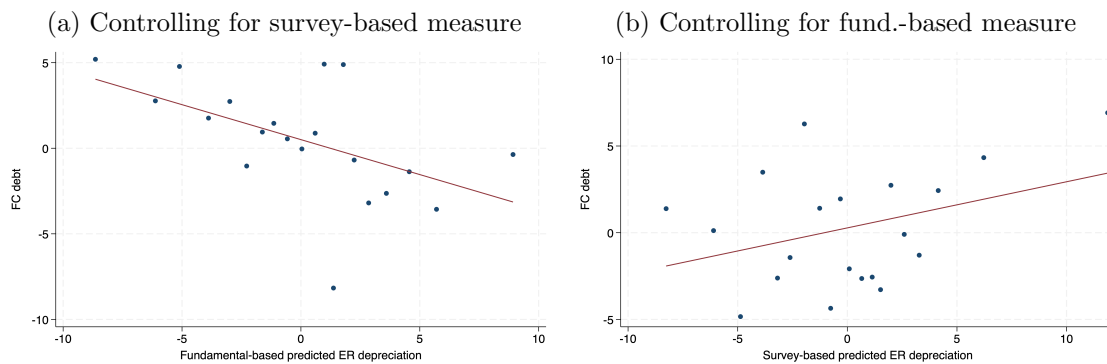
As suggested by our model, after controlling for the public signal, fundamentals affect domestic borrowers decisions through their private information. For a given public signal, a deterioration in the fundamentals (a higher fundamental-based expected depreciation) is perceived by domestic borrowers only, who exploit their informational advantage by decreasing their exposure to exchange rate risk. On the contrary, controlling for fundamentals, a deterioration in the public signal (a higher survey-based expected depreciation) generates more FC borrowing. In this case, the tighter domestic currency borrowing conditions imposed by foreign investors push domestic borrowers towards FC borrowing.

Why do we have an unconditional disconnect and a conditional re-connect? To understand, note that the consensus forecasts are strongly correlated with the fundamentals (Table B.2 in the Appendix), which is why they constitute valid public signals. Consequently, if there is a

¹⁷It is important to note that, because we do not observe fundamentals perfectly, we have a missing variable issue. As highlighted above, the fact that the survey-based expected depreciation still retains predictive power when we introduce our observed fundamentals (see Table B.3) means that there are some unobserved fundamentals that are orthogonal to the observed fundamentals and that are missing from our fundamental-based measure, but that are correlated with the survey-based measure. This means that Equation (12) has a missing variable problem when it comes to identifying the impact of the survey-based measure, as the fundamental-based measure does not control for all the fundamentals that are correlated with it. However, note that since, as predicted by the theory, β_1 , the coefficient of the fundamental-based measure, is negative, then this missing variable introduces a negative bias in β_2 . In that case, β_2 can be interpreted as a lower bound on the true coefficient. Since β_2 is positive, then our predictions are verified. Since β_1 is unbiased as long as the survey-based measure is incorporating all the contemporaneously information relevant for exchange rates (which we assume it is), then a negative β_1 and a positive β_2 are enough to validate the theory.

deterioration in the fundamentals, it will be at least partially captured by the consensus forecasts. As a result, when not controlling for the public signal, poorer fundamentals produce two opposing effects on FC borrowing: a negative direct effect (through β_1), and a positive indirect effect through a more negative signal (through β_2). This explains why the unconditional effect is weaker than the conditional effects.

Figure 3. *Foreign currency (FC) debt's and predicted exchange rate depreciation*



Source: Bank of International Settlement (BIS) International Debt Securities Statistics, International Financial Statistics (IMF), authors' calculations.

Note: The y axis represents the percentage of foreign currency debt issued by the non-financial corporate sector. The x axis represents the fundamental-based (left panel) and survey-based (right panel) predicted exchange rate depreciation. The numbers are the residuals of a regression including time and country fixed effects, the controls, and the survey-based measure in the left panel, and time and country fixed effects, the controls and the fundamental-based measure in the right panel. The sample includes 16 emerging economies over the period Q1-1990 to Q4-2019. The data are binned.

For a graphical illustration of our results, consider Figure 1. It represents the unconditional correlation between FC debt and our measure of the fundamentals at the country level. The absence of correlation illustrates the unconditional disconnect. Now consider Figure 3, which shows conditional correlations. Panel (a) shows the correlation between FC debt and fundamentals, controlling for public signals. Observations on the left of the panel have relatively good fundamentals, given the public signals. The higher FC debt in those cases can be accounted for by fundamentals that

are relatively better than what public signals suggest. This drives a negative conditional correlation between FC debt and the fundamental-based predicted depreciation in Panel (a), consistent with the negative slope in column (3). Moreover, according to Panel (b), which shows the correlation between FC debt and public signals, controlling for fundamentals, observations on the right suffers from a much more pessimistic signal as compared to others. The relatively high FC debt in those cases can be accounted for by a negative signal unwarranted by the level of fundamentals. This drives a positive conditional correlation between FC debt and the survey-based prediction depreciation in Panel (b), consistent with the positive slope in column (3).

Specification (3), however, does not account for other potentially important drivers of FC borrowing that are presumably correlated with consensus forecasts and fundamentals. In columns (4) and (5), we take into account the fact that country risk may play a role in foreign currency borrowing. In particular, country risk may generate a risk premium that increases the domestic interest rate relative to the foreign rate, for a given expected change in the exchange rate, causing a deviation from the UIP. In that case, if domestic borrowers are less risk-averse than foreign lenders, then more country risk may lead the former to take advantage of a cheaper foreign interest rate and borrow more in foreign currency. If a higher country risk affects fundamentals or consensus forecasts, then not controlling for country risk may bias the estimates.

We therefore control for measures of country-specific risk and uncertainty: the standard deviation of the nominal effective exchange rate within a quarter, using trade-weighted nominal exchange rates from Bank for International Settlements (BIS) (2019a), and the International Country Risk Guide (ICRG) (2019) political risk and exchange rate risk indices (in column 4). We invert the scale of the original indices so that a higher value indicates higher risk. We also control for the trade balance (The World Bank, 2019) since FC debt may be a good (bad) hedge for exporters

(importers), and given that most of international trade is invoiced in US dollars, as well as the Chinn-Ito index of financial openness (Chinn and Ito, 2006). Last, we control for the fourth lag of the dependent variable to account for the fact that borrowers roll-over short-term debt so that past debt compositions influence future debt compositions. Once we introduce these controls, we find that the coefficients do not change much and remain statistically significant.

One additional issue is that some fundamentals can affect FC borrowing through other channels than the disagreement channel. In particular, a larger stock of international reserves could make local borrowers more confident that they will have access to dollars if they need to repay their dollar debt at short notice, which may encourage them to borrow in dollar. The current account could also affect the currency composition of debt through domestic borrowing terms. For instance, an increase in the domestic demand for debt would trigger capital inflows and increase the domestic interest rate, while having no effect on the international rate. This would increase the fraction of FC borrowing. These two variables are therefore included in the set of controls in column (5). The results are mostly unaffected.

Currency excess return We have assumed that domestic borrowers exploit an informational advantage and borrow more in foreign currency when foreign currency financing is cheaper from their point of view. This informational advantage should materialize in positive excess returns on the domestic currency in these situations. Namely, controlling for the fundamentals, we expect a positive (negative) public signal to make market prices excessively optimistic (pessimistic) on the currency. Controlling for the public signal, we expect market prices to miss the true state of the fundamentals, so that market prices are overly pessimistic (optimistic) when the fundamentals are good (bad). To test this prediction, we estimate a regression similar to Equation (12) where the dependent variable is a measure of excess returns.

We measure the currency excess return as the annualized excess returns to a U.S. investor on a currency forward contract of maturity h . Under covered interest parity (CIP), the excess return is equal to the difference between domestic and U.S. nominal interest rates at maturity h , plus the ex-post realised change (in log difference) in the nominal exchange rate:

$$f_{h,t}^j - s_{t+h}^j = i_{h,t}^j - i_{h,t}^{US} - \Delta s_{t,t+h}^j,$$

where, as before, s_{t+h}^j is the log of the spot exchange rate between the domestic currency j and the U.S. dollar at time $t+h$ and $f_{h,t}^j$ is the corresponding log forward exchange rate of maturity h at time t , $i_{h,t}^j$ is the domestic money market rate of maturity h at time t , $i_{h,t}^{US}$ is the US LIBOR of maturity h at time t and $\Delta s_{t,t+h}^j$ is the effective depreciation of currency j vis-à-vis the dollar between t and $t+h$.

As argued by Hassan (2013), it is better to use data on forward premia rather than data on interbank rates because forward contracts are not affected by potential variation in sovereign default risk across countries. We therefore use forward rates to compute the excess returns at the 3-month (1-quarter), 12-month (4-quarter) and 24-month (8-quarter) maturity. We adapt our fundamental-based measure by using the predicted depreciation at the corresponding horizon, that is, at 1-quarter, 4-quarter and 8-quarter horizons, and not their first principal component. Similarly, we adapt our survey-based measure by using the predicted depreciation at 1-quarter, 4-quarter and 8-quarter horizons.

A potential issue is that we cannot rule out that forward contracts are affected by currency risk. To see how this can affect our results, we decompose the currency excess return into the *expected*

currency excess return and an expectation error:

$$f_{h,t}^j - s_{t+h}^j = f_{h,t}^j - E_t(s_{t+h}^j) + E_t(s_{t+h}^j) - s_{t+h}^j$$

where $E_t(s_{t+h}^j)$ is international investors' exchange rate expectation. The first term, $f_{h,t}^j - E_t(s_{t+h}^j)$, can be interpreted as a currency risk premium, while the second term, $E_t(s_{t+h}^j) - s_{t+h}^j$ is the foreign expectation error on the exchange rate. We therefore also directly estimate the expectation channel by regressing the expectation error on the consensus forecasts and the fundamentals. We use consensus exchange rate forecasts from Consensus economics to compute the 1-quarter, 4-quarter and 8-quarter expectation errors.

Table 4 shows the results. The survey-based and the fundamental-based predicted depreciation affect both the currency excess return and the expectation error with the expected sign. All the coefficients are significant, except for the fundamental-based depreciation in column (2) and for the survey-based depreciation in column (3), i.e., for the 4-quarter currency excess return and for the 8-quarter currency excess return (this dependent variable is the less populated among the 6 considered here). A survey-based expected depreciation, after controlling for the fundamentals, is associated with a stronger than expected currency. On the contrary, poorer fundamentals, controlling for the survey-based expected depreciation, are associated with a weaker than expected currency. In the former situation, when international investor expectations are relatively pessimistic, domestic agents borrow more in foreign currency. In the latter, when fundamental-driven domestic borrowers' expectations are relatively pessimistic, they borrow more in domestic currency. These results are thus consistent with a domestic informational advantage.

Depending on the horizon, a 1% increase in the fundamental-based predicted depreciation leads to a -0.29% to -0.49% increase in the excess currency return, and a -0.37% to -0.71% underestimation

Table 4. *Currency excess returns and expectations errors*

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	1q	Excess return 4q		1q	Consensus error 4q	
$\widehat{\Delta S}_{t,t+1}$	-0.495*** (0.099)			-0.709*** (0.119)		
$\widehat{\Delta S}_{t,t+4}$		-0.007 (0.121)			-0.375*** (0.110)	
$\widehat{\Delta S}_{t,t+8}$			-0.291* (0.151)			-0.419*** (0.122)
$E_t(\Delta S_{t,t+1})$	0.643*** (0.113)			1.294*** (0.111)		
$E_t(\Delta S_{t,t+4})$		0.554*** (0.139)			0.781*** (0.129)	
$E_t(\Delta S_{t,t+8})$			0.002 (0.176)			0.675*** (0.155)
Observations	665	663	459	743	735	722
R-squared	0.577	0.564	0.626	0.617	0.550	0.571
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: The dependent variables are currency excess returns, measured by the excess return on US dollar forward contracts at 1, 4 and 8-quarter maturities, and the forecast error on the exchange rate, at 1, 4 and 8-quarter maturities. $PC1(\widehat{\Delta s}_t)$ is the first principal component of the fundamental-based predictions of exchange-rate depreciation $\{\widehat{\Delta s}_{t+h,t}\}_{h=1,4,8}$; a higher value indicates a higher predicted depreciation of the domestic currency. $PC1(E_t(\Delta s_t))$ is the first principal component of the consensus exchange rate depreciation forecasts $\{E_t(\Delta s_{t+h,t})\}_{h=1,4,8}$; a higher value indicates a higher predicted depreciation of the domestic currency. The regressions include time fixed effects, regional fixed effects, and the same set of controls as in column (4) of Table 3.

of the depreciation rate. A 1% increase in the survey-based expected depreciation generates a 0.55% to 0.64% increase in the currency excess return and an overestimation of the depreciation rate of 0.67% to 1.29%, depending on the horizon.¹⁸

Table 5. *Currency excess returns and expectations errors - Direct test*

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	1q	4q	8q	1q	4q	8q
FC borrowing	0.015** (0.007)	0.040** (0.019)	0.090*** (0.034)	0.017* (0.010)	0.057*** (0.021)	0.114*** (0.030)
Observations	761	762	516	812	814	803
R-squared	0.498	0.509	0.604	0.410	0.497	0.547
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: The dependent variables are currency excess returns, measured by the excess return on US dollar forward contracts at 1, 4 and 8-quarter maturities, and the forecast error on the exchange rate, at 1, 4 and 8-quarter maturities. The regressions include time fixed effects, regional fixed effects, and the same set of controls as in column (4) of Table 3.

Note that the evidence shown in Table 4 is not a direct test of our assumption, but simply backs our interpretation of the evidence in Table 3 by confirming that our measure of fundamentals is a relatively good one. This derives by construction from the fact that the survey-based expected depreciation, which is based on contemporaneous information, is a poorer predictor of the exchange rate than the fundamental-based predicted depreciation, which is based on information available later in time.

¹⁸Note that since the survey-based predicted depreciation is positively correlated with the fundamental-based predicted depreciation, a foreign agent basing her investment decision on professional forecasts will not necessarily make systematic losses. The coefficients of the survey-based predicted depreciation can be interpreted as the losses a foreign investor would make on lending in foreign currency instead of domestic currency when the change in the consensus forecasts is unrelated to the fundamentals, that is, when it is entirely driven by noise.

A more direct test of the better information of domestic borrowers would consist in showing that FC borrowing predicts the currency excess return and the expectation error. This test is performed in Table 5. FC borrowing is positively correlated with the future currency excess returns and with the future consensus error. The coefficients are small in magnitude, but significant. For instance, a 1 percentage point increase in the share of foreign currency borrowing predicts, respectively, a 0.01%, 0.04% and 0.09% additional currency excess return at 1-quarter, 4-quarter and 8-quarter horizons. The additional consensus error that is predicted is of the same magnitude (respectively, 0.02%, 0.06% and 0.1%). If we interpret the difference as the impact of FC borrowing on the currency risk premium, then there is no significant effect of FC borrowing on the risk premium.¹⁹ All in all, more FC borrowing is associated with a stronger currency in the future than what markets and forecasters expect. It is consistent with domestic agents engaging in FC borrowing out of an informational advantage.^{20,21}

3.3 Robustness

We perform several robustness checks, reported in Table B.4 in the Appendix. We report the baseline in column (1). Then we re-estimate Equation (12) by focusing on a specific horizon for the predicted depreciation and consensus forecasts: 8-quarter, 4-quarter and 1-quarter horizons

¹⁹In theory, the impact of FC borrowing on exchange rate risk is ambiguous. There is on the one hand, a positive impact through systematic risk, and a negative effect through the disciplining effect of dollar debt.

²⁰Note that, if foreign investors and forecasters were able to observe aggregate FC borrowing in real time, this informational advantage would vanish, as the amount of FC borrowing would reveal the domestic borrowers' private information. In that case, FC borrowing would not predict the currency excess return or the consensus error. However, as with most macroeconomic variables, FC borrowing is not published in real time, which also explains why it retains predictive power. Note also that FC borrowing could in general be associated with a stronger currency through a disciplining effect (which is also present in our model). Again, foreign investors and forecasters would take this disciplining effect into account if they were able to observe FC borrowing in real time, and there would be no predictive power.

²¹This result is reminiscent of Cespa *et al.* (2021)'s result according to which FX volume helps predict the next day currency returns thanks to its informational content.

(columns (2) to (4)). Our results appear robust, except when we concentrate on the very short-term, that is, when we use the fundamental-based predicted depreciation at the 1-quarter horizon. In that case, the estimate is smaller and insignificant. This could be because corporate borrowing typically takes place at longer maturities, so that the fundamentals that have predictive power for the exchange rate at a short maturity do not matter (here exchange market pressure), or because of the high short-term volatility of the exchange rate. Further, we use as alternative public signals Standard and Poors' credit rating for sovereign dollar debt and the first principal component of the forward premia at different horizons (8, 4 and 1 quarter) (columns (5) and (6)), obtained from Datastream (2019). Credit ratings are public measures of the fundamentals that are contemporaneously available to investors. We rely on Hau *et al.* (2014) to convert credit ratings into a numerical scale, where a higher numerical rating indicates poorer credit quality. Forward rates are market prices that reflect market expectations about the depreciation of the exchange rate, and are defined as $f_{h,t}^j - s_t^j$, for $h = 1, 4, 8$. Again, our results are robust: a higher rating score or higher forward premia, which are both negative public signals, leads to more FC borrowing.

One important problem to address is that our dependent variable considers only bond transactions on international markets. This measure ignores that switching between international and local markets offers another margin of adjustment to firms: firms could turn to international markets when they want to issue in FC, and to local markets when they want to issue in peso. We therefore consider a robustness analysis with a measure of FC borrowing based on SDC data, which includes issuance on local markets (see the Data section for a detailed description of this variable). The results are reported in Column (7). The results are qualitatively similar, but the effect of the survey-based measure is less significant. In our model, public signals drive FC borrowing because it generates disagreement between domestic borrowers and foreign lenders. The SDC dataset also

includes transactions between domestic agents, which are not affected by this mechanism. This could explain why the coefficient is less significant.

Table B.5 provides the results when re-estimating Equation (12) using different sub-samples to assess whether our results are driven by specific time periods or countries. Column (1) focuses on the pre-crisis period (1992-2007) while column (2) focuses on the post-crisis (2008-2018) period. Column (3) excludes the crisis period (2008-2009). Column (4) focuses on the financially open countries (we exclude countries with a Chinn and Ito index below -1). Columns (5) to (7) exclude respectively Latin America, Asia, and other regions. The results are qualitatively robust across these sub-samples but the effects in some cases are less precisely estimated owing to small sample sizes.

4 Conclusion

This paper highlights a new channel of FC borrowing, the disagreement channel, and shows that it is at play in the data, using a sample of 16 large emerging economies. FC borrowing arises from the disagreement between domestic borrowers and foreign lenders. Notably, domestic borrowers issue debt in foreign currency when fundamentals are good or when public signals are pessimistic, which also corresponds to situations where the foreign currency is cheaper (the domestic currency has an excess return on the dollar).

Importantly, once we control for public signals, FC borrowing is more prevalent in countries with good fundamentals, that is, countries with a low depreciation risk, suggesting that financial stability implications in this case are limited. However, controlling for fundamentals, higher FC borrowing may be observed if foreign lenders receive overly pessimistic public signals. In that case, high foreign currency borrowing results from a penalty on domestic borrowing. Asymmetric

information between domestic borrowers and foreign lenders is, therefore, a potential source of financial fragility.

In light of these results, some important questions arise. First, what policy actions can be adopted to effectively reduce the asymmetric information between foreign lenders and domestic borrowers? Second, how does transparency, that is, the precision of the public signal, affect financial fragility? Finally, what determines transparency? These questions are beyond the scope of this paper and are left for future research.

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