

Macroprudential FX Regulations: Sacrificing Small Firms for Stability?



By María Alejandra Amado, Banco de España

Keywords: macroprudential FX regulations, currency mismatch, small firms, FX derivatives, emerging markets, borrowing constraints, bank lending channel

JEL codes: E43, E58, F31, F38, F41

Macroprudential FX regulation¹ may reduce systemic risk; however, little is known about its unintended consequences. In this column I describe a mechanism in which currency mismatch acts as a means for relaxing small firms' borrowing constraints and show that policies taxing dollar lending increases financing disparities between small and large firms. To verify this empirically, I study the implementation of a macroprudential FX tax by the Peruvian Central Bank. Using administrative data on the universe of formally registered firms, I show that a 10% increase in bank exposure to the policy increases the disparities in loan growth between small and large firms in 1.6 percentage points. When accounting for firms switching to local currency (soles) financing from different banks, the effect on large firms' debt is only compositional. Moreover, using data on the universe of FX contracts, I find that firms that are mostly affected by the policy are not hedged against exchange rate risk.

¹ Macroprudential FX regulations are bank measures that discriminate based on the currency denomination of an operation, with the main objective of reducing bank exposure to foreign currency risk.

Nontradable² firms in emerging economies issue large amounts of dollar debt, exposing their balance sheets to exchange rate movements and credit default risk³. This is worrisome since by exposing their own balance sheets they are indirectly exposing the asset portfolio of banks that lend to them. Regulatory authorities have responded implementing macroprudential policies on banks' use of dollar funding as a source of bank lending, particularly to nontradable firms.⁴

However, the unintended distributional effects of these regulations on firms' financing are not well understood and have remained unexplored in the literature. Macroprudential FX policies may impose disproportionate costs on small, financially constrained firms, for which currency mismatch is arguably a means for relaxing their borrowing constraints and for financing investment.⁵ In this column I provide a theoretical explanation and verify empirically that Macroprudential FX policies might increase financing disparities between small and large nontradable firms.

Mechanism

I propose a mechanism leading to heterogeneous responses of nontradable firms' outcomes to a tax on banks' dollar lending. This mechanism relies on the well documented empirical fact that dollar debt is cheaper than local currency debt, after correcting for expected exchange rate depreciation.⁶ And, therefore, some firms might find it beneficial to expose their balance sheets to currency risk by issuing dollar debt.

Under this mechanism, firm's optimal decision on debt denomination is driven by two opposing forces: if they denominate their debt in local currency, firms avoid insolvency risk. On the other hand, if firms issue dollar debt and take currency mismatch risk, they can take advantage of the cheaper cost of borrowing in dollars. For financially constrained firms (e.g. small firms), currency mismatch allows them to relax their borrowing constraints and increase their leverage and investment possibilities. Meanwhile, for unconstrained firms (e.g. large firms), the trade-off between leverage gains and insolvency risk is irrelevant.

Imposing a macroprudential tax on lender's dollar funding, ultimately increases firm's cost of borrowing in dollars. If dollar debt becomes more expensive, the firm could find it optimal to switch away from dollar debt to more expensive but risk-free local currency debt. Alternatively, if the gains of taking on mismatch risk are still high enough after the tax, the firm could find it optimal to keep on issuing dollar debt, and pay the tax. In either case, firm's cost of borrowing increases after the tax is implemented. In an equilibrium where firms are small, borrowing constraints become tighter after tax. Then, not only does the tax might affect the currency composition of firms' debt, but also generates real effects in the economy. By contrast, in an equilibrium of large firms, issuing dollar debt is not a means for relaxing borrowing constraints; the tax only generates a change in the currency composition of firm's debt but does not affect total borrowing.

² I refer to nontradable firms as those firms not involved in trade activities, that is, non-exporting and non-importing firms.

³ Bruno and Shin (2015); McCauley, et al. (2015).

⁴ Peru, Bulgaria, Croatia, and Romania are four of many examples. (See the IMF 2017 MaP survey).

⁵ See Ranciere et al. (2010) for evidence on the relationship between currency mismatch and growth for small firms in emerging countries in Europe.

⁶ See for example Ivashina, et al. (2020), DiGiovanni, et al (2020), Salomao and Varela (2022).

Macprudential FX regulation in Peru

To verify this empirically, I take advantage of an unprecedented and arguably unexpected macroprudential FX policy intervention by the Central Bank of Peru (BCRP). In December 2014, it announced it was implementing a policy that would increase the reserve requirements (*tax*) on banks' dollar liabilities. This increase was heterogeneous across banks, depending on the following rule: the BCRP required that by December 2015 (*deadline*), banks in the financial system had to reduce their stock of dollar loans⁷ to, at most, 90% of its own stock in September 2013 (*benchmark*). Otherwise, banks had to pay a tax on their FX liabilities proportional to the difference between their stock of dollar loans at the *deadline* and at the *benchmark*.

Based on this rule, two sources of variation determine banks' exposure to the policy: First, for a given increase in the tax rate, banks that at the announcement more strongly rely on dollar funding are more exposed to the tax. Second, for a given degree of reliance on dollar funding, banks that at the announcement are further from the regulatory benchmark are also more exposed to the tax. These two sources of bank exposure are strongly correlated: banks that at the announcement rely more heavily on dollar funding are also further from the regulatory benchmark.⁸ Therefore, this regulation can be understood more simply as a progressive tax on banks' dollar liabilities: the tax rate increases as the base increases.

Effects on firm size

Figure 1 shows the evolution of aggregate loans before and after a Macroprudential FX policy intervention by the Central Bank of Peru in December 2014. The blue dashed line shows the evolution of the normalized stock of *dollar* loans for the sample of nontradable firms and for the smallest (micro) and largest size categories (large). The red line shows the evolution of the normalized stock of total loans (in both dollars and soles). This plot shows that the growth rate of *total* loans was almost the same as that of *dollar* loans before the policy announcement. However, they start differing afterwards. In line with the proposed mechanism, this might suggest that firms were switching away from dollar borrowing to soles borrowing to avoid the higher costs of the tax. This substitution, if any, is clearly not complete for micro firms (panel a). However, large firms seemed to have completely avoided the tax by switching to soles debt, thus keeping their total financing unaffected relative to the pre-tax trend (panel b).

⁷ Excluding loans granted to exporters or importers. Excluding loans granted to exporters or importers.

⁸ The explanation is on the well documented evidence on banks hedging incentives and the presence of regulatory limits on banks' FX risk exposure. See Keller (2019) for evidence on Peruvian banks, and Canta et al. (2006) and Tobal (2018) for evidence in emerging economies.

Figure 1: Evolution of dollar and total loans

Figure 1a: Micro firms

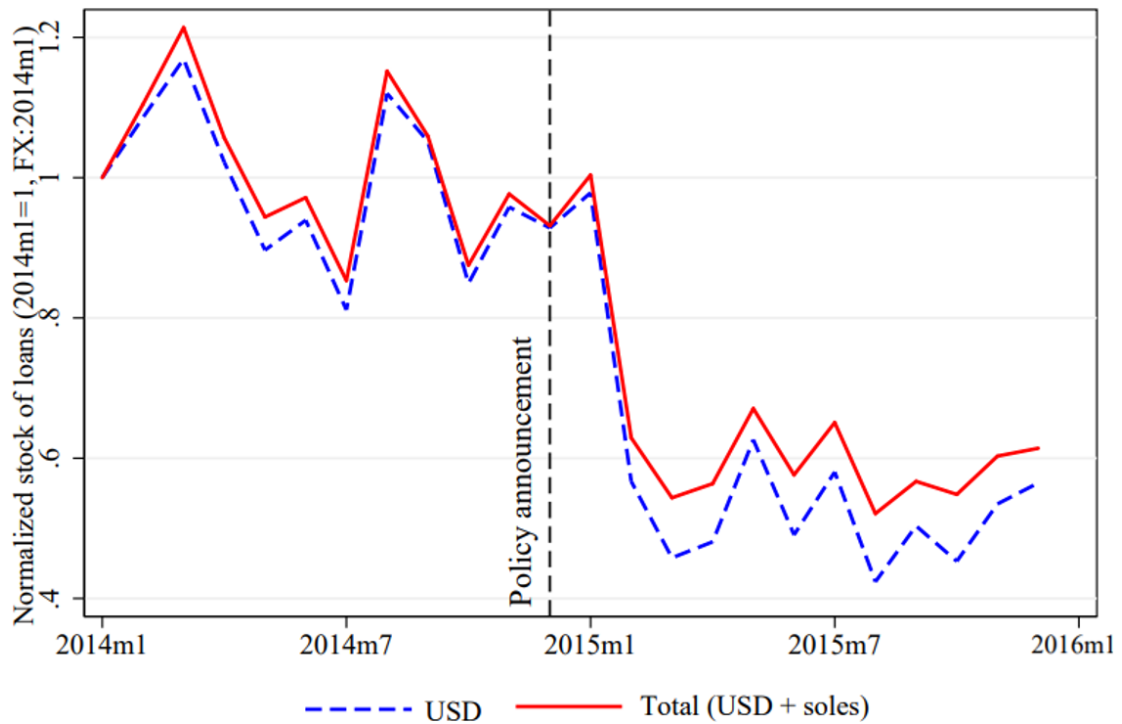
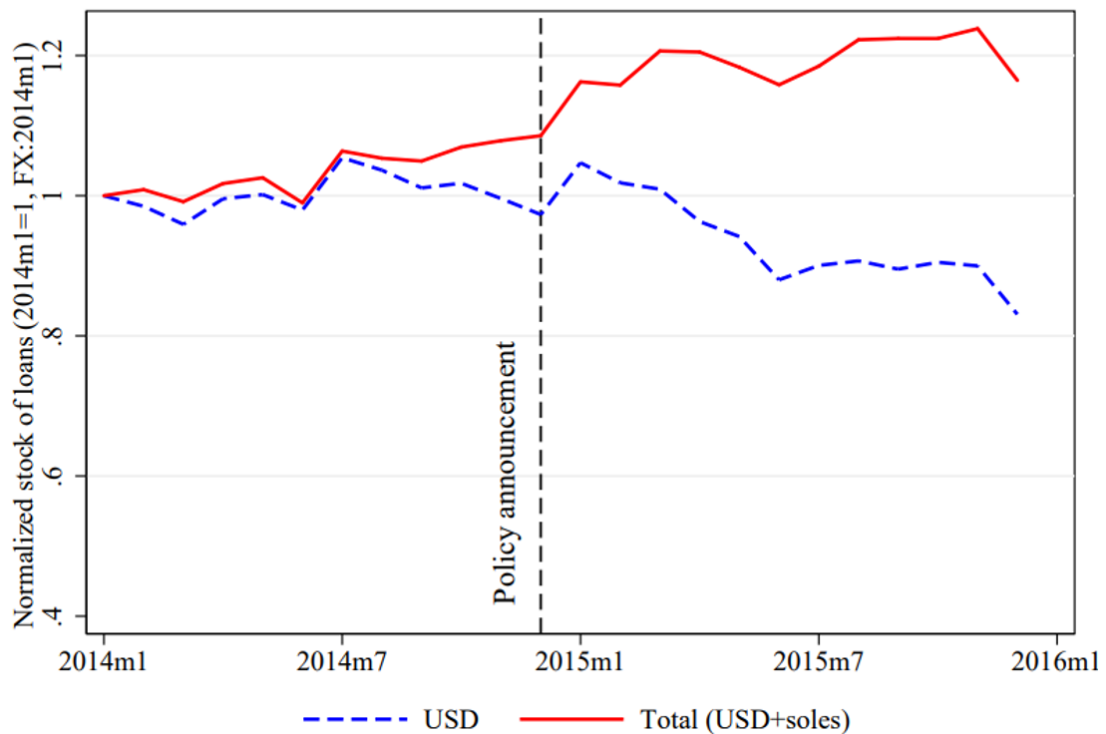


Figure 1b: Large firms

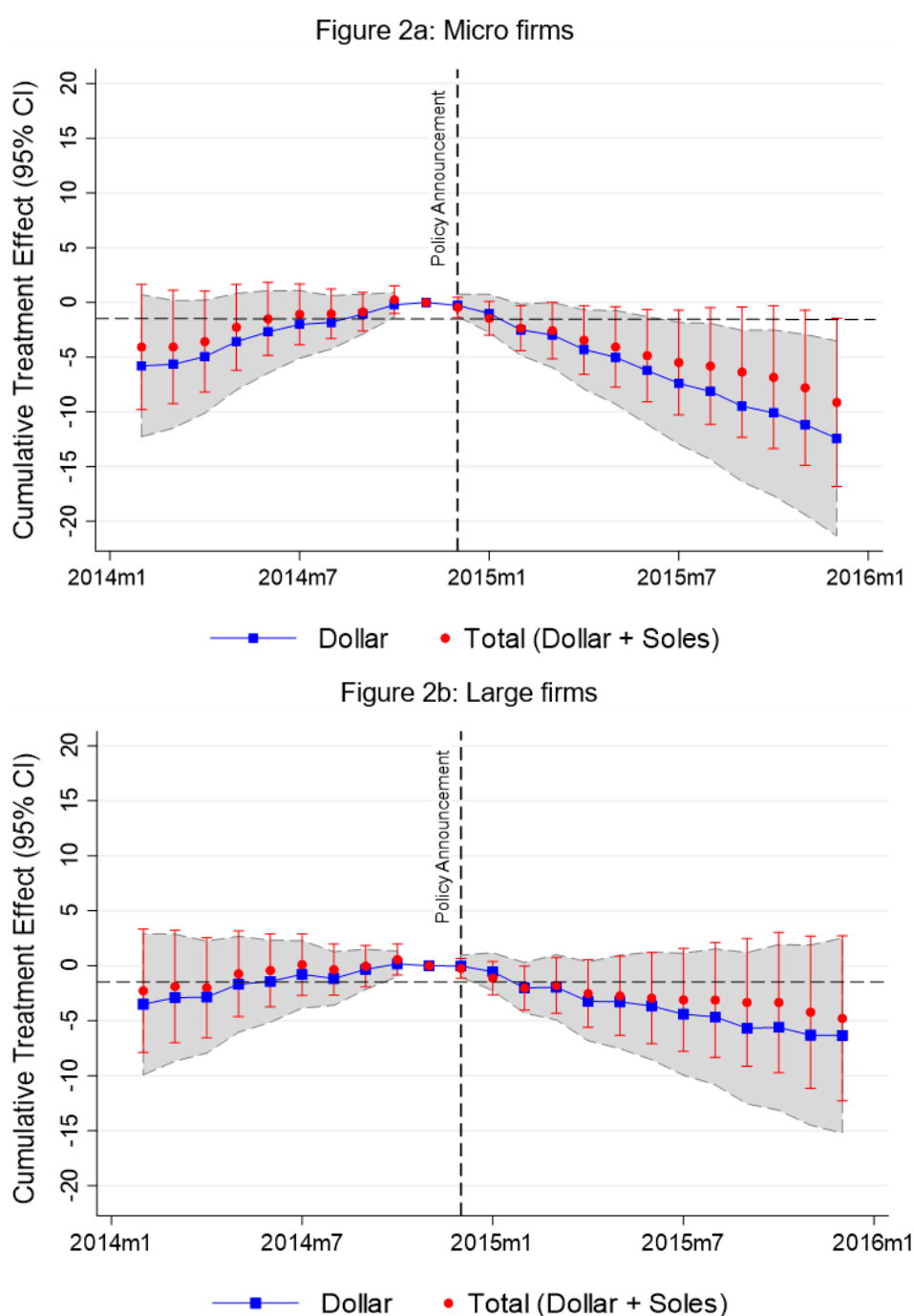


To formally verify this hypothesis, I exploit the cross-sectional variation in banks' exposure to the tax to identify the bank lending channel of the macroprudential tax to nontradable firms. Simultaneously, I test whether firms borrowing from differently exposed banks respond heterogeneously to this supply shock.

Figure 2 shows the cumulative reduction in the monthly growth rate of *dollar* and *total* loans, for a given a marginal increase in bank exposure to the policy. The cumulative effect on *dollar* and *total* loans for the *micro* size segment become statistically significant at the 5% level, three months after the announcement. And after that, the cumulative effect on total loans departs from the effect on dollar loans. This suggests that firms begin to switch from dollar loans toward soles loans around four months after policy announcement. By the deadline, one year after the policy announcement, a 1% increase in bank exposure results in a cumulative reduction in the growth rate of dollar loans of 12.1 percentage points. The reduction in *total* loans is 8.7 percentage points.

For *large* firms, the cumulative effect of the policy on *dollar* and *total* loans is negative but not significantly different from zero in any of the periods after the treatment. Also, there seem to be a degree of substitution to soles loans starting 5 months after the announcement. In contrast to the *micro* segment, the overall cumulative effect on *total* loans is not statistically significant.

Figure 2: Cumulative Treatment Effect Micro and Large firms



I replicate my empirical strategy at the firm level to account for the possibility of firms borrowing in soles also from other banks, to avoid the burden of the regulation. I find that micro firms remain significantly negatively affected by the tax, while firms in larger size categories are able to exploit their multiple relationships with differently exposed banks to increase their debt in soles and remain unaffected by the tax. Additionally, I show that firms that are mostly affected by the policy are not hedged against exchange rate risk through FX derivatives.

Finally, I conduct a back-of-the-envelope calculation to show that the aggregate average effect of the policy in the growth rate of *total* loans is a reduction of 2.9 percentage points. For the *micro* segment, this reduction is 9 percentage points, for *large* firms, this reduction is of 1.6 percentage points.

Conclusions

In this column I provide evidence of a potential trade-off between small firms' growth and financial stability that has not been studied in the literature. My results taken together show that policies aimed at achieving financial stability through the restriction of the bank lending channel in foreign currency, might end up disproportionately hurting small firms' financing possibilities with potential real implications. It is worth noting that I am not taking a stance on the optimality of these policies, for which I would need to account for the likelihood and the size of the counterfactual growth losses of small firms in an episode of a large exchange rate depreciation. The findings in this study have important implications for policy design. ■

References

- Bruno, V., & Shin, H. S. (2015). Capital flows and the risk-taking channel of monetary policy. *Journal of Monetary Economics*, vol 71, pp 119-32.
- Canta, M., Collazos, P., & Shiva, M. (2006). Limites a las posiciones de cambio como mecanismo de mitigacion del riesgo cambiario. SBS, *Revista de Temas Financieros*, 119-136.
- DiGiovanni, J., Kalemli-Ozcan, S., Ulu, M. F., & Baskaya, Y. S. (2021). International spillovers and local credit cycles. *The Review of Economic Studies*, Volume 89, Issue 2, March 2022, Pages 733-773.
- Ivashina, V., Salomao, J., & Gutierrez, B. (2020). Why is dollar debt cheaper? Evidence from Peru. Available at SSRN: <https://ssrn.com/abstract=3599475>.
- Keller, L. (2019). Capital Controls and Risk Misallocation: Evidence from a Natural Experiment. Jacobs Levy Equity Management Center for Quantitative Financial Research Paper, Available at SSRN: <https://ssrn.com/abstract=3099680> or <http://dx.doi.org/10.2139/ssrn.3099680>.
- McCauley, R., McGuire, P., & Sushko, V. (2015). Dollar credit to emerging market economies. *BIS Quarterly Review* (December), 27-41.
- Ranciere, R., Tornell, A., & Vamvakidis, A. (2010). Currency mismatch, systemic risk and growth in emerging europe. *Economic Policy*, Vol. 25, No. 64, pp. 597-658.
- Ranciere, R., & Tornell, A. (2016). Financial liberalization, debt mismatch, allocative efficiency, and growth. *American Economic Journal: Macroeconomics*, 8 (2): 1-44.
- Salomao, J., & Varela, L. (2022). Exchange Rate Exposure and Firm Dynamics. *The Review of Economic Studies*, Volume 89, Issue 1, January 2022, Pages 481-514.
- Tobal, M. (2018). Currency mismatch in the banking sector in Latin America and the Caribbean. *International Journal of Central Banking*, vol.14(1), pages 317-364, January.

About the author

Maria Alejandra Amado is a research economist at the International Economics and Euro Area Department at the Bank of Spain. She holds a PhD in Economics from the University of California, at Los Angeles (UCLA). Her research interests focus on International Economics, Macroeconomics and Finance.

SUERF Publications

Find more **SUERF Policy Briefs** and **Policy Notes** at www.suerf.org/policynotes



SUERF is a network association of central bankers and regulators, academics, and practitioners in the financial sector. The focus of the association is on the analysis, discussion and understanding of financial markets and institutions, the monetary economy, the conduct of regulation, supervision and monetary policy.

SUERF's events and publications provide a unique European network for the analysis and discussion of these and related issues.

SUERF Policy Briefs (SPBs) serve to promote SUERF Members' economic views and research findings as well as economic policy-oriented analyses. They address topical issues and propose solutions to current economic and financial challenges. SPBs serve to increase the international visibility of SUERF Members' analyses and research.

The views expressed are those of the author(s) and not necessarily those of the institution(s) the author(s) is/are affiliated with.

All rights reserved.

Editorial Board

Ernest Gnan
Frank Lierman
David T. Llewellyn
Donato Masciandaro
Natacha Valla

SUERF Secretariat
c/o OeNB
Otto-Wagner-Platz 3
A-1090 Vienna, Austria
Phone: +43-1-40420-7206
www.suerf.org • suerf@oenb.at