

Credit cycles and macroprudential policy framework in emerging countries¹

Salih Fendođlu²

Introduction

Due to large and unprecedented quantitative easing policies and the prevailing policy uncertainty in advanced economies, many emerging countries have faced large and excessively volatile short-term capital flows during the recent era. If not managed properly and timely, such flows can give rise to an amplified cycle of steady appreciation of the currency, a strong rise in asset prices, looser credit market conditions, and build-up of balance sheet risks. This fragility may eventually trigger a sudden reversal of such flows (often called “sudden stop”), leading to a sharp currency depreciation and a large contraction in credit and output.³ In turn, to reduce the build-up of financial stability risks and contain ‘excessive’ cycles in credit market conditions, emerging countries have increasingly utilised macroprudential policy tools.⁴

In this paper, we assess how macroprudential policy tools perform in major emerging countries in containing ‘excessive’ credit cycles. In particular, we first compile an index of policy stance for widely used macroprudential tools, using existing databases on macroprudential policy actions and national sources.⁵ We then study whether changes in the policy stance contain ‘excessive’ cycles in domestic

¹ We would like to participants at various conferences and workshops for helpful suggestions. The views expressed here are those of the authors and should not be interpreted as reflecting the views of the Central Bank of the Republic of Turkey.

² Central Bank of the Republic of Turkey.

³ There is a large literature on the effect of sudden stops on emerging country business cycles. Among many, see Calvo (1998), Caballero and Krishnamurty (2004), Calvo et al (2008), Mendoza (2006, 2010), Bianchi (2011), and for a review of the literature, Korinek and Mendoza (2013). For empirical evidence at a micro-level, see Altunok et al. (2016).

⁴ This goes without emphasising that various countercyclical financial regulatory practices in the spirit of, as now known, macroprudential policies have been implemented in early decades (eg, see Elliott et al (2013) and Brunnermeier and Schnabel (2015) for advanced economies). What makes the recent era unique is much frequent and systematic use of such tools and the strong emphasis on (and better understanding of) the soundness of the whole financial system (beyond that of individual institutions) in a highly interconnected financial system within and across national borders. See Crockett (2000), Borio (2003) and Clement (2010) for early discussions on “macroprudential” policy, and Lim et al (2011), Galati and Moessner (2013), Claessens (2014) and Bruno et al (2015) for a thorough review of the recent literature.

⁵ We use the databases on macroprudential policy actions presented in Lim et al (2011, 2013), Shim et al (2013) and Cerutti et al (2015). The country set is a panel of 18 major emerging countries (Brazil, Bulgaria, Chile, Colombia, Croatia, the Czech Republic, Hungary, Indonesia, Korea, Malaysia, Mexico, the Philippines, Poland, Romania, Russia, South Africa, Thailand and Turkey) for the period of 2000Q1–2013Q2. Our choice for the country set and time span is mainly based on the availability of data on macroprudential policy actions and domestic credit.

credit, and particularly from the perspective of emerging countries, whether they help contain excessive credit cycles due to fluctuations in capital inflows.

Assessing the performance of a macroprudential policy framework at a multiple-instrument multi-country level is challenging. First, there are many macro-financial targets against which the effectiveness of macroprudential tools can be evaluated. Even if one focuses on a single aggregate target, most notably credit growth, as a potential measure of risk-taking and build-up of financial imbalances, an important concern prevails: more credit might very well mean financial deepening and better access to financial services, and therefore, foster investment and output. Moreover, while 'excessive' fluctuations in credit (eg cyclical credit growth or credit-to-GDP gap) can be taken as a proper target variable, misjudging what might be an 'excessive' level may eventually yield misleading results. Second, the type and intensity of macroprudential policy actions differ significantly across countries and over time.⁶ A simplification, therefore, is often made in multi-country analyses by using the number of tools in place to infer the macroprudential policy stance. This approach, however, can be quite restrictive for frequently used tools. Last, macroprudential policies in emerging countries should in principle help make the economy more resilient to adverse external factors, and therefore, a crucial additional dimension, often missing in this very literature, is whether macroprudential policies, particularly those that are tailored to tame the effect of capital flows on domestic cycles, can moderate 'excessive' credit cycles due to swings in capital inflows.

In this paper, we take a step forward to address these challenges. We consider several measures of 'excessive' credit against which we assess how macroprudential tools perform.⁷ Since credit creation necessarily involves risk taking, an excessive growth in credit may indicate significant risk taking and pose a significant threat to real economic activity. Indeed, a historically high level of credit (beyond its long-run trend level) is widely recognised as a robust indicator for the build-up of financial imbalances.⁸ Along these lines, we use a credit-to-GDP gap using a recursive (one-sided) long-run trend as our main target credit variable. For reasons discussed in Fendoglu (2016) in detail, we also consider the credit-to-GDP gap using a recursive medium-run trend, change in credit-to-GDP ratio and an indicator variable for 'credit boom' as defined by Dell'Ariccia et al (2012) as alternative measures of excessive credit.

⁶ In essence, macroprudential policy tools can be 'desirable' only if they mitigate certain externalities within the economy. While examples of heterogeneity in the use of macroprudential tools are numerous, an example could be the use of LTV cap (which can be regarded a priori as easier to quantify and compare across the economies). An LTV cap might be implemented for specific segments of property market (residential versus commercial real estate), for specific regions (tighter policy for speculative metropolitan areas) and for different assets (real estate versus vehicles), which differs widely across countries and over time.

⁷ On theoretical grounds, recent papers have contributed significantly to our understanding of the externalities that justify the use of macroprudential tools (eg externalities due to strategic complementarities, fire sales or interconnectedness). Among others, see Allen and Gale (2000), Caballero and Krishnamurthy (2003), Lorenzoni (2008), Fostel and Geanakoplos (2008), Korinek (2011), Bianchi (2011), Brunnermeier and Sannikov (2014), Korinek and Sandri (2015), Bianchi and Mendoza (2015). For an early review of this literature, see De Nicolo et al (2012).

⁸ See, eg, Borio and Lowe (2004), Mendoza and Terrones (2008, 2012), Drehmann et al (2011), Dell'Ariccia et al (2012), Schularick and Taylor (2012), Drehmann and Tsatsaronis (2014), BCBS (2010) and IMF (2011a, 2011b).

Second, the index of macroprudential policy stance that we have compiled takes into account potential heterogeneity in the use of tools as well as the intended policy direction (easing or tightening). In particular, we consider policy actions regarding widely used macroprudential tools: caps on loan-to-value (LTV) and debt-service-to-income (DSTI) ratios, countercyclical capital requirements, time-varying/dynamic loan-loss provisioning, restrictions on foreign currency lending, and limits on net open currency position. For each tool, the macroprudential policy stance index takes successively higher values for tightening and successively lower values for easing actions. By reflecting the policy direction (tightening or easing) in the index, we provide a more complete picture on the actual use of macroprudential tools at a multi-country level.

We further take into account whether the policy action regarding a specific tool is geared towards general domestic purposes or towards capital flow management (CFM) purposes (eg higher risk weights on foreign-currency (FX) loans as a currency-based CFM tool), which is particularly relevant for emerging countries. We then aggregate these individual indices into major categories: an index of policy stance regarding (i) borrower-based tools (MaPP-Bw); (ii) financial institutions-based tools (MaPP-FI); (iii) domestic-currency measures (MaPP-D); and (iv) FX-related measures (MaPP-FX).⁹ Finally, we supplement the analyses with domestic or foreign currency-based reserve requirement policy actions (RR-D and RR-FX, respectively).

Figures 1 through 3 present the use of macroprudential and reserve requirement policies in emerging countries. They show that (i) borrower-based measures and countercyclical capital requirements on financial institutions are used much more frequently than the other tools; (ii) macroprudential policy actions, particularly financial institutions-based ones, have been undertaken increasingly more over time, where most actions are after the global financial crisis; (iii) FX-related macroprudential tightening actions have been undertaken much more frequently after the global financial crisis; and (v) domestic and foreign currency reserve requirements are used more frequently than the macroprudential measures, where the former is used mostly for cyclical purposes and the latter is tilted towards tightening.

To this end, we estimate the effectiveness of macroprudential policy actions in a dynamic panel framework.¹⁰ Our set of control variables include monetary policy

⁹ Similar classifications can be found in FSB/IMF/BIS (2011), Claessens et al (2013) and Cerutti et al (2015). We do not consider measures related to cross-sectional risks (eg limits on interbank exposures, capital surcharges on systemically important financial institutions or concentration limits) due to lack of available data. Moreover, regarding capital flow management tools, we confined our interest to FX-related macroprudential measures (which can also be labelled as currency-based capital flow measures). We did not include capital control measures since they are residency-based, only indirectly targeting macro-financial aggregates, and generally not taken as 'macroprudential' policy actions.

¹⁰ By macroprudential policy action, we specifically mean one-quarter change in the respective index. The results are by and large robust to using 2-, 3-, or 4-quarter change in the index. Given the dynamic structure, we use Arellano and Bond (1991) GMM estimator that addresses the Nickell (1981) bias and ensures that the lagged endogenous variable is orthogonal to the residual. Moreover, the GMM estimator, by using lagged levels as instruments, mitigates potential endogeneity of macroprudential measures. We also would like to note that any remaining endogeneity would create an attenuation bias in our framework, ie a tighter MaPP is likely to reduce credit gap, whereas higher expected credit gap may lead to a tighter MaPP today. Therefore, our results should be read as a lower bound on the effectiveness of MaPP. In other words, a significant negative coefficient should be interpreted as a lower bound for the (absolute value) of the 'true' coefficient. Moreover, quantifying the 'true' intensity

stance, aggregate demand conditions (real GDP growth), a proxy for balance sheet conditions (annual change in the real exchange rate) and portfolio inflows (cross-border banking inflows-to-GDP ratio, following Bruno and Shin (2014)).¹¹

Figures 4 and 5 present the summary of main results in Fendoglu (2016). Figure 4 provides the results for whether macroprudential and reserve requirement policy actions help contain the target credit variables we consider, and Figure 5 whether they help contain the sensitivity of the target credit variables to portfolio inflows.¹² In a nutshell:

- a tightening in macroprudential policy stance, most notably MaPP-Bw or MaPP-D, helps contain credit-to-GDP gap (both under long-run and medium-run recursive trends). While it is hard to draw a conclusion, borrower-based measures might be harder to circumvent or tightening actions on borrower-related measures might be finely calibrated and in turn such policy actions might be binding for a wider set of credit transaction counterparties.
- Financial institutions-based measures may also appear effective (eg, by reducing changes in the credit-to-GDP ratio). Our take is that while MaPP-FI class of tools can affect credit as it arises, the evidence is rather limited on whether the reduction in the credit per se can be comfortably regarded as desirable/appropriate.
- Financial institutions-related measures appear significantly effective, perhaps as expected, in reducing the sensitivity of credit gap to cross-border banking inflows (though for only the recent period and only mildly significantly). Yet, if we take a broader definition for portfolio inflows (eg net or gross portfolio inflows or net portfolio debt flows), a tightening in MaPP-FI appears counterproductive, pointing out potentially strong spillovers to unregulated segments of the financial system. On the other hand, MaPP-Bw and MaPP-D appear significantly effective in reducing the sensitivity.
- Domestic-currency reserve requirement tightening actions appear not significant in containing the target credit variables per se, but are strongly robust and significant in reducing the sensitivity of target credit variables to portfolio inflows. Foreign-currency reserve requirement tightening actions, on the other hand, appear by and large ineffective in containing excessive credit cycles.

In sum, regarding the question, “Can macroprudential policy tools help contain excessive credit cycles in emerging countries?” our answer is a broad yes, depending on the category of macroprudential policy tools considered. The evidence is rather strong for borrower-based and domestic currency-related macroprudential policy actions in containing the credit gap, financial institutions-based policy actions in

of macroprudential policy actions is challenging especially at a multi-instrument multi-country level. Thus, we would especially be encouraged if we find macroprudential measures significant in affecting the target variables.

¹¹ We gauge monetary policy stance by estimating a Taylor-type rule gap. In particular, we estimate unexpected movements in the short-term policy rate above and beyond what inflation and output would imply. The results are robust to including change in the real exchange rate in the policy rule. The results are also robust to using change in the policy rate or change in the M2-to-GDP ratio. For portfolio inflows, as we present shortly below, we also study gross portfolio flows, net portfolio flows, or net portfolio debt flows.

¹² In Figures 4 and 5, we consider the whole sample period as well as the recent period where most macroprudential policy actions are undertaken. The whole period corresponds to 2000Q1–2013Q2, and the recent period corresponds to 2008Q1 onwards.

reducing credit as it arises, and domestic reserve requirement policy tightening actions in reducing the sensitivity of target credit variables to portfolio inflows. The results are by and large stronger for the recent period.

References

- Allen, F, D Gale, (2000): "Financial contagion", *Journal of Political Economy* 108(1), 1–33.
- Altunok, F, S Fendoglu, A Oduncu, S Ongena (2016): "Tracing the impact of a sudden stop through the credit supply channel", *Mimeo*.
- Fendoglu, S (2016): "Credit cycles and capital flows: effectiveness of macroprudential policy tools in emerging countries", *Mimeo*.
- Basel Committee on Banking Supervision (2010): *Guidance for National Authorities Operating the Countercyclical Capital Buffer*, December.
- Bianchi, J (2011): "Overborrowing and systemic externalities in the business cycle", *American Economic Review* 101 (7), 3400–3426.
- Bianchi, J, E G Mendoza (2015): "Optimal time-consistent macroprudential policy", *BIS Working Paper*, no 516.
- Borio, C (2003): "Towards a macroprudential framework for financial supervision and regulation?", *BIS Working Paper*, no 128.
- Borio, C, Lowe, P (2004): "Securing sustainable price stability: should credit come back from the wilderness?", *BIS Working Paper*, no 157.
- Brunnermeier, M K, Sannikov, Y (2014): "A macroeconomic model with a financial sector", *American Economic Review*, no 104, 379–421.
- Brunnermeier, M, Schnabel, I (2015): "Bubbles and central banks: historical perspectives", *Working Paper*.
- Bruno, V, I Shim, H S Shin, (2015): "Comparative assessment of macroprudential policies", *BIS Working Papers*, no 502.
- Caballero, R, A Krishnamurthy (2003): "Excessive dollar debt: financial development and underinsurance", *Journal of Finance* 58(2), 867–894.
- Calvo, G A (1998): "Capital flows and capital-market crises: the simple economics of sudden stops", *Journal of Applied Economics* 1(1), 35–54.
- Calvo, G, A Izquierdo, L-F Mejia (2008): "Systemic sudden stops: the relevance of balance-sheet effects and financial integration", *NBER Working Paper*, no 14026.
- Cerutti, E, S Claessens, M Laeven, (2015): "The use and effectiveness of macroprudential policies: new evidence", *IMF Working Paper*, WP/15/61.
- Claessens, S, Ghosh, S, Mihet, R (2013): "Macroprudential policies to mitigate financial system vulnerabilities", *Journal of International Money and Finance* 39, 153–185.
- Claessens, S (2014): "An overview of macroprudential policy tools", *IMF Working Paper*, WP/14/214.
- Clement, P (2010): "The term 'macroprudential': origins and evolution", *BIS Quarterly Review*, September, 59–67.

Crockett, A (2000): "Marrying the micro- and macroprudential dimensions of financial stability", BIS Speeches, 21 September.

Del'Araccia, G, K Igan, L Laeven, H Tong, B Bakker and J Vandebussche (2012): "Policies for macrofinancial stability: How to Deal with Credit Booms", IMF Staff Discussion Note SDN/12/06.

de Nicolo, G, G Favara, L Ratnovski, (2012): "Externalities and macroprudential policy", IMF Staff Discussion Notes 12/05.

Drehmann M, C Borio, K Tsatsaronis (2011): "Anchoring countercyclical capital buffers: the role of credit aggregates", *International Journal of Central Banking* 27, 189–240.

Drehmann, M, K Tsatsaronis (2014): "The credit-to-GDP gap and countercyclical capital buffers: questions and answers", *BIS Quarterly Review*, March.

Elliott, D, G Feldberg, A Lehnert (2013): "The history of cyclical macroprudential policy in the United States", Federal Reserve Board Finance and Economics Discussion Series no 2013-29.

Fostel, A, J Geanakoplos (2008): "Leverage cycles and the anxious economy", *American Economic Review* 98(4), 1211–1244.

Galati, G, R Moessner (2013): "Macroprudential policy - a literature review", *Journal of Economic Surveys*, 27(5), 846–878.

International Monetary Fund (2011a). *Macroprudential policy: an organizing framework*.

International Monetary Fund (2011b): *Macroprudential policy: an organizing framework – background paper*.

International Monetary Fund (2014): *Staff Guidance Note on macroprudential policy – detailed guidance on instruments*.

Korinek, A (2011): "Systemic risk-taking: amplification effects, externalities, and regulatory responses", *Working Paper*.

Korinek, A, E Mendoza (2013): "From sudden stops to Fisherian deflation: quantitative theory and policy implications", *Annual Review of Economics* 6, 299–332.

Korinek, A, D Sandri, (2015): "Capital controls or macroprudential regulation?" *Journal of International Economics*, forthcoming.

Lim, C H, F Columba, A Costa, P Kongsamut, A Otani, M Saiyid, T Wezel, X Wu (2011): "Macroprudential policy: what instruments and how are they used? Lessons from country experiences", *IMF Working Paper*, WP/11/238.

Lim, C H, I Krznar, F Lipinsky, A Otani, X Wu (2013): "The macroprudential framework, policy responsiveness and institutional arrangements", *IMF Working Paper*, WP/13/166.

Lorenzoni, G (2008): "Inefficient credit booms", *Review of Economic Studies*, 75(3), 809–833.

Mendoza, E (2006): "Lessons from the debt-deflation theory of sudden stops", *American Economic Review*, 96(2), 411–416.

Mendoza, E (2010): "Sudden stops, financial crises, and leverage", *American Economic Review*, 100(5), 1941–66.

Mendoza, E, M Terrones (2008): "An anatomy of credit booms: evidence from macro aggregates and micro data", *NBER Working Paper*, no 14049.

Mendoza, E, M Terrones (2012): "An anatomy of credit booms and their demise", *NBER Working Paper*, no 18379.

Schularick, M, A Taylor (2012): "Credit booms gone bust: monetary policy, leverage cycles, and financial crises, 1870–2008", *American Economic Review*, 102, 1029–1061.

Shim, I, B Bogdanova, J Shek, A Subelyte (2013): "Database for policy actions on housing markets", *BIS Quarterly Review*, September.

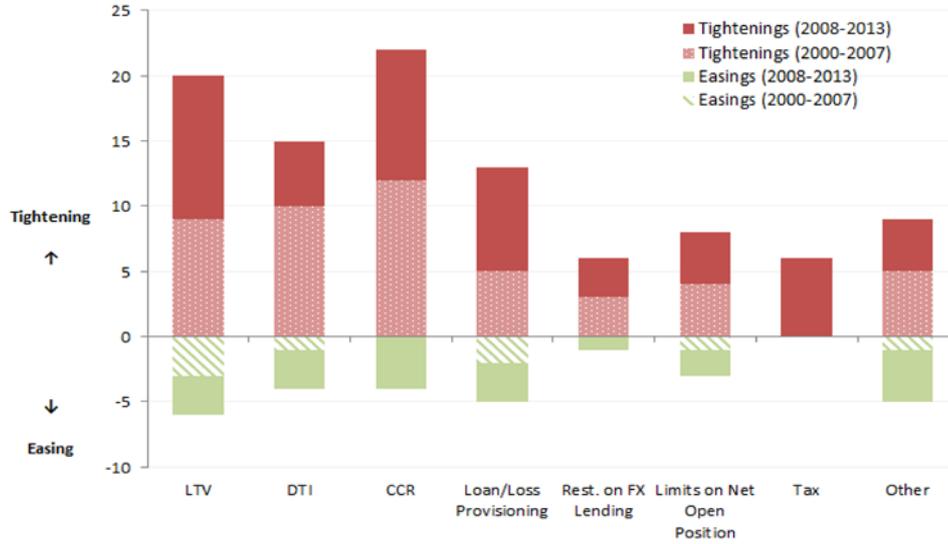


FIGURE 1. Use of Macroprudential Policy Tools (Aggregate number of tightenings versus easings in emerging countries). Sources: Authors' calculations based on Lim *et al.* (2011, 2013), Shim *et al.* (2013), IMF (2014), Cerutti *et al.* (2015), and country sources.

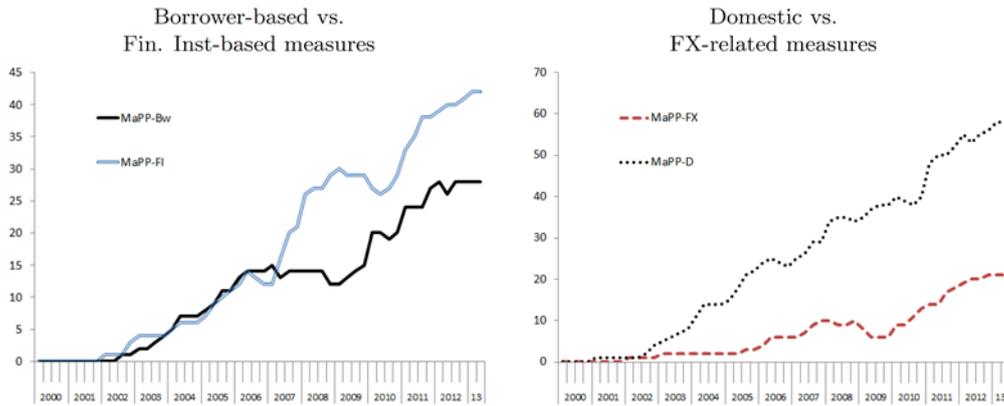


FIGURE 2. Macroprudential policy stance for emerging countries over time. MaPP-Bw denotes borrower-related measures, MaPP-FI denotes financial-institutions-related measures, MaPP-D reflects domestic macroprudential policy actions and MaPP-FX reflects FX-related macroprudential actions. Policy stance is measured as tightenings net of easings.

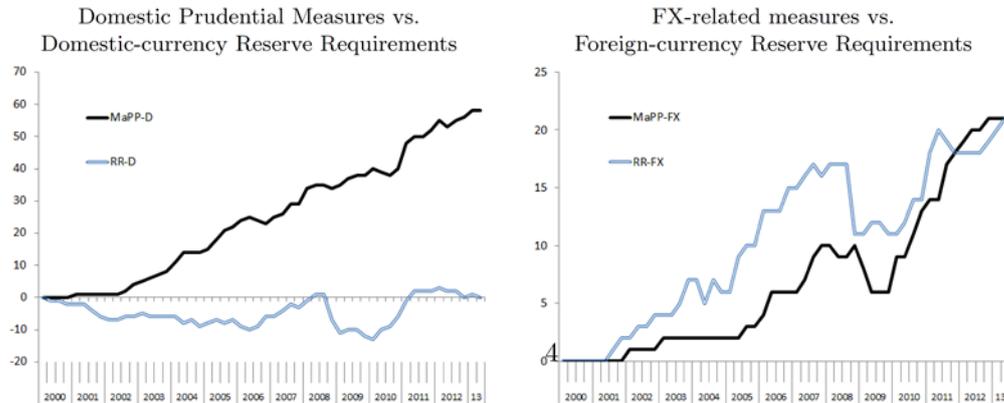


FIGURE 3. Reserve requirements and macroprudential policy stance over time.

FIGURE 4: CAN MACROPRUDENTIAL POLICY ACTIONS HELP CONTAIN EXCESSIVE CREDIT CYCLES?

	Whole Period				Recent Period			
	Credit-to-GDP gap		Credit-to-GDP gap		Credit-to-GDP gap		Credit-to-GDP gap	
	(long-run recursive trend)	(medium-run recursive trend)	Δ (Credit/GDP)	Credit Boom	(long-run recursive trend)	(medium-run recursive trend)	Δ (Credit/GDP)	Credit Boom
Portfolio Banking Inflows	MaPP-Bw***	MaPP-Bw***	MaPP-Bw***	MaPP-Bw	MaPP-Bw***	MaPP-Bw***	MaPP-Bw***	MaPP-Bw
	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI
	MaPP-D***	MaPP-D	MaPP-D***	MaPP-D	MaPP-D***	MaPP-D***	MaPP-D***	MaPP-D
	MaPP-FX**	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX***	MaPP-FX**	MaPP-FX	MaPP-FX
	MPI***	MPI	MPI***	MPI	MPI***	MPI***	MPI***	MPI
RR-D	RR-D	RR-D	RR-D	RR-D	RR-D	RR-D***	RR-D	
RR-FX	RR-FX	RR-FX	RR-FX	RR-FX	RR-FX	RR-FX	RR-FX	
Gross Portfolio Inflows	MaPP-Bw***	MaPP-Bw***	MaPP-Bw***	MaPP-Bw	MaPP-Bw***	MaPP-Bw***	MaPP-Bw***	MaPP-Bw
	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI
	MaPP-D***	MaPP-D	MaPP-D***	MaPP-D	MaPP-D***	MaPP-D***	MaPP-D***	MaPP-D
	MaPP-FX	MaPP-FX**	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX
	MPI***	MPI***	MPI***	MPI	MPI	MPI***	MPI***	MPI
RR-D	RR-D	RR-D	RR-D	RR-D	RR-D	RR-D	RR-D	
RR-FX	RR-FX	RR-FX	RR-FX	RR-FX	RR-FX	RR-FX	RR-FX	
Net Portfolio Inflows	MaPP-Bw***	MaPP-Bw***	MaPP-Bw***	MaPP-Bw	MaPP-Bw***	MaPP-Bw***	MaPP-Bw***	MaPP-Bw
	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI
	MaPP-D***	MaPP-D	MaPP-D***	MaPP-D	MaPP-D***	MaPP-D***	MaPP-D***	MaPP-D
	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX
	MPI***	MPI***	MPI***	MPI	MPI	MPI	MPI***	MPI
RR-D	RR-D	RR-D	RR-D	RR-D	RR-D	RR-D	RR-D	
RR-FX	RR-FX	RR-FX	RR-FX	RR-FX	RR-FX	RR-FX	RR-FX	
Net Portfolio Debt Inflows	MaPP-Bw***	MaPP-Bw***	MaPP-Bw***	MaPP-Bw	MaPP-Bw***	MaPP-Bw***	MaPP-Bw***	MaPP-Bw
	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI
	MaPP-D***	MaPP-D	MaPP-D***	MaPP-D	MaPP-D***	MaPP-D***	MaPP-D***	MaPP-D
	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX*	MaPP-FX	MaPP-FX**	MaPP-FX	MaPP-FX
	MPI***	MPI***	MPI***	MPI	MPI***	MPI***	MPI***	MPI
RR-D	RR-D	RR-D	RR-D	RR-D	RR-D	RR-D***	RR-D	
RR-FX	RR-FX	RR-FX	RR-FX	RR-FX	RR-FX	RR-FX	RR-FX	

Notes. The category of tools are MaPP-Bw (borrower-based), MaPP-FI (financial-institutions-based), MaPP-D (domestic), MaPP-FX (FX-related), MPI (overall), RR-D (domestic-currency reserve requirement), and RR-FX (FX reserve requirement). ***, **, and * denote significance levels at 1%, 5%, and 10%, respectively, based on robust standard errors. A negative and statistically significant coefficient estimate (that is the respective category of tool appear helpful in containing the target credit variable) is highlighted with a light green background.

FIGURE 5: CAN MACROPRUDENTIAL POLICY ACTIONS HELP CONTAIN EXCESSIVE CREDIT CYCLES *due to portfolio flows*?

	Whole Period				Recent Period			
	Credit-to-GDP gap		Credit-to-GDP gap		Credit-to-GDP gap		Credit-to-GDP gap	
	(long-run recursive trend)	(medium-run recursive trend)	Δ (Credit/GDP)	Credit Boom	(long-run recursive trend)	(medium-run recursive trend)	Δ (Credit/GDP)	Credit Boom
Portfolio Banking Inflows	MaPP-Bw	MaPP-Bw	MaPP-Bw	MaPP-Bw	MaPP-Bw	MaPP-Bw***	MaPP-Bw***	MaPP-Bw***
	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI*	MaPP-FI*	MaPP-FI	MaPP-FI	
	MaPP-D	MaPP-D	MaPP-D	MaPP-D	MaPP-D	MaPP-D*	MaPP-D	MaPP-D***
	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX***
	MPI	MPI	MPI	MPI	MPI	MPI*	MPI***	MPI***
	RR-D**	RR-D**	RR-D	RR-D**	RR-D**	RR-D	RR-D	RR-D***
	RR-FX	RR-FX	RR-FX	RR-FX***	RR-FX	RR-FX	RR-FX	RR-FX***
Gross Portfolio Inflows	MaPP-Bw*	MaPP-Bw**	MaPP-Bw***	MaPP-Bw	MaPP-Bw***	MaPP-Bw***	MaPP-Bw***	MaPP-Bw
	MaPP-FI***	MaPP-FI***	MaPP-FI**	MaPP-FI	MaPP-FI***	MaPP-FI**	MaPP-FI*	MaPP-FI
	MaPP-D***	MaPP-D	MaPP-D***	MaPP-D	MaPP-D***	MaPP-D**	MaPP-D***	MaPP-D
	MaPP-FX	MaPP-FX*	MaPP-FX*	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX
	MPI***	MPI*	MPI***	MPI	MPI	MPI**	MPI***	MPI
	RR-D***	RR-D**	RR-D***	RR-D***	RR-D***	RR-D***	RR-D***	RR-D***
	RR-FX	RR-FX	RR-FX	RR-FX*	RR-FX	RR-FX	RR-FX	RR-FX***
Net Portfolio Inflows	MaPP-Bw***	MaPP-Bw***	MaPP-Bw***	MaPP-Bw	MaPP-Bw***	MaPP-Bw***	MaPP-Bw***	MaPP-Bw
	MaPP-FI***	MaPP-FI***	MaPP-FI***	MaPP-FI	MaPP-FI	MaPP-FI*	MaPP-FI*	MaPP-FI
	MaPP-D***	MaPP-D***	MaPP-D***	MaPP-D	MaPP-D***	MaPP-D**	MaPP-D***	MaPP-D
	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX
	MPI***	MPI***	MPI***	MPI	MPI**	MPI***	MPI***	MPI
	RR-D***	RR-D***	RR-D***	RR-D**	RR-D***	RR-D***	RR-D***	RR-D***
	RR-FX*	RR-FX**	RR-FX	RR-FX***	RR-FX	RR-FX*	RR-FX	RR-FX***
Net Portfolio Debt Inflows	MaPP-Bw*	MaPP-Bw	MaPP-Bw***	MaPP-Bw	MaPP-Bw***	MaPP-Bw***	MaPP-Bw***	MaPP-Bw
	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI	MaPP-FI
	MaPP-D	MaPP-D	MaPP-D***	MaPP-D	MaPP-D*	MaPP-D**	MaPP-D***	MaPP-D
	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX*	MaPP-FX	MaPP-FX	MaPP-FX	MaPP-FX
	MPI	MPI*	MPI***	MPI	MPI**	MPI	MPI***	MPI
	RR-D***	RR-D	RR-D*	RR-D	RR-D	RR-D	RR-D	RR-D
	RR-FX	RR-FX	RR-FX	RR-FX	RR-FX**	RR-FX	RR-FX**	RR-FX

Notes. The category of tools are MaPP-Bw (borrower-based), MaPP-FI (financial-institutions-based), MaPP-D (domestic), MaPP-FX (FX-related), MPI (overall), RR-D (domestic-currency reserve requirement), and RR-FX (FX reserve requirement). ***, **, and * denote significance levels at 1%, 5%, and 10%, respectively, based on robust standard errors. A negative and statistically significant coefficient estimate (that is the respective category of tool appear helpful in containing the sensitivity of target credit variable to portfolio flows) is highlighted with a light green background. A positive and statistically significant coefficient estimate is highlighted with a dark red background.