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## The use and effectiveness of macroprudential policies: New evidence

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### ABSTRACT

Using a recent IMF survey and expanding on previous studies, we document the use of macroprudential policies for 119 countries over the 2000–2013 period, covering many instruments. Emerging economies use macroprudential policies most frequently; especially foreign exchange related ones while advanced countries use borrower-based policies more. Usage is generally associated with lower growth in credit, notably in household credit. Effects are less in financially more developed and open economies, however, and usage comes with greater cross-border borrowing, suggesting some avoidance. And while macroprudential policies can help manage financial cycles, they work less well in busts.

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### 1. Introduction

Macroprudential policies – such as caps on loan to value and debt to income ratios, limits on credit growth and other balance sheet restrictions, (countercyclical) capital and reserve requirements and surcharges, and Pigouvian levies – have become part of the policy paradigm in emerging markets and advanced countries alike. The fundamental rationales behind such policies, although not always clearly articulated, arise from key externalities and

market failures associated with activities of financial intermediaries and markets that can lead to excessive procyclicality and the buildup of systemic risk, resulting in financial crises and worse economic outcomes. While procyclicality and systemic risks can arise from many factors, including aggregate shocks to economic fundamentals (e.g., commodity price shocks) and deficiencies in microprudential and monetary policy, risks can remain that need to be addressed by macroprudential policies, even when the conduct of policies is adequate. Conversely, even though macroprudential policies can mitigate financial or business cycles or discipline large financial institutions, only externalities or market failures justify a macroprudential approach.

While the precise sources of externalities operating through the financial system, and the corresponding appropriate macroprudential policies remain to be determined, most analyses (e.g., Brunnermeier et al., 2009; De Nicolò et al., 2012), classify the known externalities as follows: First, those related to strategic complementarities, i.e., that arise from the strategic interactions of banks and other financial institutions and agents, and which cause the build-up of vulnerabilities during the expansionary phase of a financial cycle; second, those related to fire sales and credit crunches, i.e., that arise from a generalized sell-off of assets causing a decline in asset prices, a deterioration of balance sheets of intermediaries and investors, and a drying up of financing, especially

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during the contractionary phase of a financial (and business) cycle; and third, those related to interconnectedness, caused by the propagation of shocks from systemic institutions or through financial markets or networks (“contagion”).

Many macroprudential tools have been proposed, and some have been used even before the recent crisis, to address these various externalities. The toolkit available includes existing microprudential and other regulatory tools, taxes and levies, and new instruments. Most tools considered to date apply to the banking system, mainly given the presence of microprudential tools more easily adaptable to macroprudential objectives and the related more extensive theory and knowledge of these tools. While tools can be grouped in many ways, one typical form is a five-way split: (a) quantitative restrictions on borrowers, instruments or activities; (b) capital and provisioning requirements; (c) other quantitative restrictions on financial institutions’ balance sheets; (d) taxation/levies on activities or balance sheet composition; and (e) other, more institutional-oriented measures, such as accounting changes, changes to compensation, etc. The first four measures are meant to capture variation across time, institutions, or states, while the fifth group contains more structural measures.<sup>2</sup> Except for the first group, which aims to capture demand for financing, all can be seen as affecting the supply side of financing. Correspondingly, a commonly used two-way classification of measures is borrower- or lender-oriented tools.

While macroprudential policies are being increasingly used, notably so since the global crisis (which also led to many other reforms of financial policies and institutions),<sup>3</sup> information on what policies are actually used across a large set of countries and over a longer period of time is still quite limited. And related, relatively few analyses exist on what policies are most effective in reducing procyclicality in financial markets and associated systemic risks.<sup>4</sup> This paper aims to fill these two gaps.

We first describe the usage of a large number of macroprudential policies, 12 to be precise, for a large, diverse sample of 119 countries over the 2000–2013 period. And second, we study the relationships between the use of these policies and developments in credit and housing markets, with a view to analyzing the effectiveness of these policies in managing credit and financial cycles. This database and related research are made possible by a recent survey of country authorities conducted by the International Monetary Fund. The survey includes detailed information on the timing and use of different macroprudential policies and to the best of our knowledge, is the most comprehensive database on macroprudential policies to date. This is the first paper to process and document the results of this new survey, as well as systematically analyze them.

We document that macroprudential policies are used more frequently in emerging economies, with foreign exchange related policies especially used more intensively in these economies. Borrower-based policies (such as caps on loan to value (LTV) and debt to income (DTI) ratios) are used relatively more in advanced countries, especially recently. And almost all countries use some policies to reduce systemic risks arising from intra-financial system vulnerabilities, including from dominant banks and interconnections among banks. Using panel regression, we find that some of these macroprudential policies are associated with reductions

in the growth rates in (real) credit and house prices. Specifically, borrower-based policies, such as limits on LTVs and DTIs, and financial institutions-based policies, such as limits on leverage and dynamic provisioning, appear to be especially effective. And policies seem more effective when growth rates of credit are very high, but they provide less supportive impact in busts.

We find evidence of weaker associations between macroprudential policies and credit developments in financially more open economies and those economies that have deeper and presumably more sophisticated financial systems, suggesting some evasion. We also show that the usage of macroprudential policies is associated with relatively greater cross-border borrowing, again suggesting countries face issues of avoidance, which they may be able to limit through adapting their financial sector regulations and adopting capital flow management tools.

Our work builds on the growing literature on the links between macroprudential policies and financial stability. This literature falls into two groups.<sup>5</sup> The first group includes cross-country studies that consider the link between macroprudential policies and credit growth and other financial indicators, albeit generally in smaller samples than we do. One of the first such studies was [Lim et al. \(2011\)](#). They analyze the links between macroprudential policies and developments in credit and leverage. They find evidence suggesting that the presence of policies such as LTV and DTI limits, ceilings on credit growth, reserve requirements (RR), and dynamic provisioning rules are associated with reductions in the procyclicality of credit and leverage. [IMF \(2013b\)](#) investigates, also in a cross-country context, how (changes in) policies affect financial vulnerabilities (credit growth, house prices, and portfolio capital inflows) and the real economy (output growth and sectoral allocation), considering also whether effects are symmetric between tightening and loosening. It finds that both (time-varying) capital requirements and RRs are significantly negatively associated with credit growth and LTV limits and capital requirements are strongly associated with lower house price appreciation rates, and reserve requirements are associated with a reduction in portfolio inflows in emerging markets with floating exchange rates. It finds that LTVs appear to impact overall output growth, but no other policies do so.

Other cross-country studies focus on the relationships between macroprudential policies and risks of a financial crisis and developments in banks and international financing. [Dell’Ariccia et al. \(2012\)](#) find that macroprudential policies can reduce the incidence of general credit booms and decrease the probability that booms end up badly. Macroprudential policies reduce the risk of a bust, while simultaneously reducing how the rest of the economy is affected by troubles in the financial system. [Claessens et al. \(2013\)](#) investigate how changes in balance sheets of individual banks in 48 countries over 2000–2010 respond to specific policies. They find that measures aimed at borrower’s LTV and DTI caps, and credit growth and foreign currency lending limits are effective in reducing the growth in bank’s leverage, asset and noncore to core liabilities growth. While countercyclical buffers also help mitigate increases in bank leverage and assets, few policies help stop declines in adverse times.

[Zhang and Zoli \(2014\)](#) review the use of key macroprudential instruments and capital flow measures in 13 Asian economies and 33 other economies since 2000 and study their effects. Their analysis suggests that measures helped curb housing price growth, equity flows, credit growth, and bank leverage, with loan-to-value ratio caps, housing tax measures, and foreign currency-related measures having the most effect. [Bruno et al. \(2015\)](#) investigate, also for 12 Asia-Pacific countries, how macroprudential policies

<sup>2</sup> Other dimensions of relevance include whether tools are meant to be broad based vs. more targeted and rules-based vs. more discretionary.

<sup>3</sup> [Claessens and Kodres \(2015\)](#) review financial reforms in general; see [FSB \(2014\)](#) for policy makers’ assessment.

<sup>4</sup> Related, the analytical foundations of macroprudential policies are still to be defined more precisely (see [Hanson et al., 2011](#); [De Nicolò et al., 2012](#); [Freixas et al., 2015](#), for further analyses and discussions).

<sup>5</sup> For other reviews, see [Bank of England \(2009\)](#), [CGFS \(2012\)](#), [England Central Bank \(2012\)](#), [IMF \(2013a,b\)](#), [ESRB \(2014\)](#), [Galati and Moessner \(2011\)](#), [Galati and Moessner \(2014\)](#) and [Claessens \(2015\)](#).

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