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The broad policy toolkit
for financial stability:
Foundations, fences, and
fire doors

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THE BROAD POLICY TOOLKIT FOR FINANCIAL STABILITY: FOUNDATIONS, FENCES, AND FIRE DOORS

By

Etienne Lepers & Caroline Mehigan¹

The post financial crisis period has been associated with increased countercyclical use of various financial policies, including residency-based measures. This paper analyses in a single analytical framework the relative effectiveness of three types of financial policies – macroprudential (foundations), currency-based (fences), and residency-based measures (fire doors).

The findings in this paper are based on a granular quarterly database of adjustments in these policies that covers both advanced and emerging economies from 2000 to 2015. The results show that residency-based measures on bonds and credit reduce capital inflows but provide limited support for a credit-mitigation role. While no evidence emerges that macroprudential measures alter capital inflows, most appear effective in reducing credit growth. Currency-based measures may reduce both inflows and credit growth (particularly FX reserve requirements and FX lending regulations).

These results indicate that the impact of policies needs to be analysed at a granular level and that policy makers should adopt an integrated view of the financial policy toolkit.

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1. INTRODUCTION

The Global Financial Crisis (GFC) led to important changes in the way Central banks, Ministries of Finance, and regulators use their policy toolkit. Three major financial policy trends have emerged over the past decade. *First*, policymakers departed from a purely micro-prudential approach after the crisis, moving to a “macro-prudential” perspective of financial regulation and tools. The consensus in favour of using such an approach to fight systemic risk and financial instability built up surprisingly quickly in the international community (Baker 2015). This has led to the setting of clear macroprudential mandates and authorities across the globe as well as a wide expansion of the macro-prudential policy toolkit (MPMs).

A *second* trend is the use of “currency-based measures” (CBMs). These new types of measures discriminate –e.g. apply less favourable treatment– on the basis of the currency of an operation, typically foreign currencies. CBMs are often taken with a macro-prudential intent and have proliferated in the post crisis period (e.g. De Crescenzo et al, 2015 and 2017).

The *third* trend is the revival of the debate on the desirability of traditional residency-based measures (RBMs). This revival was partly fuelled by the increased global liquidity in an environment of low returns and low monetary policy rates in advanced countries, and capital flows searching yields in emerging economies. The post-GFC years have been characterised by increased capital flows to emerging countries while flows between advanced countries have reduced. Indeed, cross-border banking flows have yet to recover to their pre-crisis levels. This led emerging markets to call for increased use of residency-based measures to combat surges into their economies for both financial stability and exchange rate management reasons. In parallel, the IMF changed its policy stance on capital controls by issuing its “Institutional View” in 2012 to guide IMF staff recommendations, supporting the use of capital flow management measures in limited cases, when a country faces severe pressures from inflows and all other policy options have been exhausted.

Building on these three trends, this paper proposes an integrated approach to these three types of policies, analysing them as part of a single financial policy toolkit. The findings in this paper are based on a database of financial policy actions for these three policy measures at the granular level, on a quarterly basis and for a sample of advanced and emerging economies, and tests their relative effectiveness on both capital flows and domestic credit growth in a common empirical framework.

The metaphors of “foundations”, “fences” and “firedoors” illustrate the different effects these policies can have: MPMs are associated with foundations and strong foundations keep a building stable. They are designed to last and to keep the building upright in times of internal or external shocks or negative conditions. MPMs are employed to strengthen the financial system and ensure its stability in times of internal or external shocks to the system. CBMs act as fences in the sense that they are hurdles but not complete barriers. A fence will stop certain external elements from approaching the building, but not all. Just as CBMs filter operations, they incentivise local currency over FX operations, and hence affect cross border flows, as most of the flows are denominated in foreign currency (De Crescenzo et al, 2017). Finally, residency-based measures act as fire doors as they are designed to prevent any capital inflow reaching the economy or any external aspects reaching the building.²

This paper contributes to a substantial body of literature, which considers the use, and effectiveness of these policy instruments. Work on macroprudential policies has mainly attempted to assess their impact on credit growth or asset prices. Work on capital flow management measures has traditionally sought to

² While this paper is only concerned with inflows, equivalently RBMs can prevent outflows.

assess their impact on the composition and volume of capital flows. This topic is gaining newfound momentum with a widened research agenda.

The classification of these policy measures, their motivations, and the related bodies of literature on their effectiveness have become increasingly blurred. RBMs, for example, are increasingly considered as part of the prudential toolkit. This was evident in some emerging markets following the GFC when RBMs were introduced in response to greater capital inflows against a backdrop of high global liquidity and low interest rates. MPMs can in turn affect capital flows with evidence suggesting that the tightening of MPMs in a country can lead to greater outflows of credit as banks look to lend abroad if their supply of the domestic market is limited. CBMs lie at the intersection between MPMs and RBMs. They are often introduced for macro-prudential reasons but are also used to discourage flows as most of the FX liabilities and assets targeted originate cross-border.

This paper brings more clarity to the debate on these policy types by taking the insights from the separate domains of literature to propose a single analytical framework for analysing the effectiveness of MPMs, CBMs, and RBMs on capital inflows and credit growth. This enables a control of policies that are adjusted or introduced simultaneously. The paper complements earlier attempts to take a more integrated perspective of the toolkit, notably Ostry (2012), Zhang et al (2014), Fendoglu (2017) and Claessens (OECD, 2017). One area of improvement compared to existing literature is the variety of ways to define and measure residency-based measures or policies used in these studies and how sensitive results are to the level of detail or granularity of the policy. The paper leverages previous data compilation efforts and substantially extends them to produce a single database covering all three types of policies.

Secondly, the paper argues that a core issue of empirical research on residency-based measures is differentiating the type of measure on structural or episodic use. Often indicators or indices used in the analysis of these measures cover a range of policies that may have very different objectives: e.g. an RBM may be introduced in response to capital inflows, or is a policy being eased as part of a broader capital account liberalisation policy. The latter case would be largely exogenous to developments in the local market, while the former is a responsive policy. In order to get a closer comparison with RBMs and their use in terms of financial stability, a series that strips out the structural, or long-term liberalisation policies is created, to leave only the episodic uses of RBMs (e.g. a reserve requirement or tax on inflows adjusted along the cycle). This difference seems to have been so far overlooked by the literature and helps explain the mixed empirical results with regards to the (a)-cyclical use of capital controls (Schmitt-Grohé et Uribe 2017, Pandey et al 2015).

The third contribution is to try to address several challenges appearing in work on policy effectiveness. First, a key issue is to capture the intensity of policy measures. For example, a tax on cross border capital movements of 1% or 20% will likely have very different effects on capital flows, but to capture this in the data is difficult given the range of policies used across and within countries. The first wave of papers on capital controls and macroprudential tools built slow moving indices based on dummies reflecting the presence or not of tools. Such indices would not be able to capture policy actions relating to adjustments of the measures (ratios, scope, and definitions). This paper follows more recent work in coding every *policy adjustment* whether it is introduced or removed, tightened or eased; this is made consistent for all three types of policies. While this does not solve the intensity issue, it gets closer to that objective. This effort also helps mitigate the small data sample issues, which proved problematic for many earlier empirical efforts, and allows for more robust regression analysis.

Finally, related to small sample issues, most of the research aggregates the use of different policy tools into macro-prudential indices or residency-based indices. The paper argues that this overlooks fundamental differences in the nature of the various policy instruments (e.g. episodic residency based use vs. long term capital account liberalisation, LTV caps vs. liquidity ratios or large exposure limits), with important consequences for findings on their effectiveness. The constructed policy database provides a level of

granularity that enables an analysis of the distinct effects of each specific policy, in line with the aim of macro-prudential authorities to “map the appropriate tool to the specific risk identified”.

Equipped with a unique integrated database on these three types of policies, the results first highlight that residency-based measures on bonds and credit reduce capital inflows, particularly when used episodically. Policies on equity inflows can have unintended effects on inflows. Traditional macro prudential measures are not found to alter capital inflows, while reserve requirement on FX liabilities reduce inflows, similarly measures targeting FX assets also tempered inflows pre-crisis. Second, the results point to some renewed evidence of the effectiveness of macroprudential tools in reducing credit growth (particularly lending standards and large exposure limits); new evidence on the importance of currency-based measures (particularly FX reserve requirements and regulations of FX lending), and mixed evidence for a credit-mitigation role for residency-based measures.

The paper proceeds as follows: Section II takes stock of the empirical work so far on the effectiveness of financial policies as well as point to the caveats this paper is trying to address. Section III presents a conceptual framework on the interactions between MPMs, CBMs, and RBMs with financial stability. Section IV discusses the data, explains the construction of the new database on financial policies used in this paper as well as presents some stylised facts in the use of these policies in recent years. Section V details the empirical model and presents aggregate analysis. Section VI reports the granular results and main policy implications. Section VII concludes.

2. BRINGING TOGETHER THE LITERATURES ON MACRO-PRUDENTIAL TOOLS AND CAPITAL CONTROLS

The use of capital controls remains an unsettled debate and a renewed topic of research and discussion in policy and academic circles alike. Prior to the crisis, the consensus in policymaking circles was that a move towards more open and liberalised capital markets was the ultimate objective once an economy had a sufficient level of economic and financial development. The OECD Code of Liberalisation of Capital Movements, the sole multilateral instrument among State parties dedicated to openness and transparency in cross-border capital flow policies, helped and monitored since the 1960's the gradual and orderly liberalisation of its adherents' capital account. However, in the environment of low interest rates in advanced countries, recipient countries of capital inflow surges started questioning the mainstream stance against using RBMs. Reflecting the renewed debate, in 2012 the IMF issued its Institutional View (IV) on capital flow management, providing a new framework for guiding staff advice.

In parallel, there was increased focus on the use of MPMs to support financial stability by advanced countries and the use of CBMs became more widespread.

The effectiveness of RBMs is an ongoing discussion and the literature is extensive on this topic. In many country experiences, it was found that capital controls do not affect the volume of inflows or significantly assist exchange rate stabilisation (Magud and Reinhart 2006). They can however, affect the composition of inflows; in some cases, they shifted the inflows from short-term towards longer maturity operations. Furthermore, there can be negative externalities at the firm level associated with capital controls. Following the introduction of controls in certain economies, there is evidence that access to funding became harder for firms that depend on external finance, typically small and medium sized firms (Forbes 2007, Alfaro et

al 2014). Shifts in constraints from the monetary policy trilemma have also been confirmed in the case of adjustments in capital controls (Pasricha et al 2018).

The use of capital controls for prudential purposes - and whether they could have a positive impact on financial stability variables - is a more recent theoretical research question, which has not received much empirical analysis. The consideration of capital controls for prudential purposes originate from a large literature analysing the relationship between financial stability indicators and capital flows. Lane & McQuade (2014) establish that domestic credit growth in European countries was strongly related to net debt inflows. Igan and Tan (2017) find that non-FDI capital inflows boost credit growth and increase the likelihood of credit booms in both household and corporate sectors.

Theoretical contributions have made the case for optimally adjusting RBMs along the domestic cycle for prudential purposes. The conventional view in this theoretical body of literature is that RBMs should be used counter-cyclically – increased during economic booms and loosened during contractions (Korinek and Sandri 2016, Bianchi 2011). Schmitt-Grohe and Uribe (2017) argue contra this conventional view, their model points to pro-cyclical capital control policy being optimal. It should be kept in mind however, that capital inflows are often the result of global push factors and not necessarily closely aligned with the domestic business cycle.

Empirically, the concept of prudential RBMs adjusted along the cycle does not hold. Fernandez et al (2015) find that RBMs are remarkably stable over the business cycle: policymakers have historically not raised controls when output, exchange rate and current account are in the boom phase, nor eased in busts. RBMs are remarkably a-cyclical, including perfect a-cyclical during the Great Recession of 2007-2009. Pandey et al (2015) analyse India, and conclude that RBMs were used primarily in response to exchange rate movements, and that macro prudential concerns do not seem to be a factor shaping their use, nor have RBMs have had an impact on financial stability variables. Fratzscher (2012) provides further empirical evidence that the historical motivations for RBMs have not been to smooth the financial or business cycles: they were not raised in response to build-up of financial vulnerabilities like asset price or credit growth, nor defensively in response to avoid further exchange rate appreciation. More recently, Pasricha (2017) demonstrates that adjustments of controls on flows in EMEs responded systematically to both mercantilist and macroprudential concerns. Specifically, EMEs have been using both controls on inflows and outflows for mercantilist motives while only using controls on inflows for macroprudential ones.

This paper will try to shed light on the potency of RBMs when actively adjusted along the macroeconomic and financial cycle. By stripping out the observations of capital controls as part of a structural liberalisation, this paper gets hopefully closer to the possible effectiveness of RBMs when used episodically.

Research on MPMs has been rapidly developing, following the surprisingly fast shift to macro-prudential approaches in the international community post-global financial crisis (Baker 2015). The literature was initially struggling to cope with this fast development, as the time series since introduction of the tools were not long enough and the data points to have a meaningful identification of their effectiveness. Nonetheless, a number of recurrent results have emerged from this wide literature. Macro-prudential policies are generally associated with a reduction in credit growth. Cerutti et al (2015) finds that the link between macro-prudential tools and credit growth is weaker in more developed and more financially open economies. Fendoglu (2017) argues that macro-prudential tools are effective in addressing the external source of vulnerabilities as well, finding that macro-prudential policies contain the impact of portfolio inflows on the credit cycles.

As for the specific type of tools, borrower-based policies like caps on LTV and DSTI ratios are generally found more effective than capital based tools (Zhang and Zoli 2014, Cerutti et al 2017, Fendoglu 2017). They are found to enhance households' resilience and mitigate credit growth (Igan and Kang 2011, Akinci and Ohmstead-Rumsey 2018), but do not appear effective to limit house price growth (Kuttner and Shim 2016). Reserve requirements have also been found to be effective in reducing credit growth and the impact

of credit cycles (Fendoglu 2017) while the evidence is more mixed in other studies (Kuttner and Shim 2016, Bruno et al 2015). Schularick and Shim (2017) find that reserve requirements reduce credit growth over one to four years, while borrower based tools are effective only on credit in a timespan of one to two years.

Research on currency-based measures is still in its infancy. CBMs are regulations applied on financial institutions, based on the currency denomination of the capital transaction, usually imposing stricter requirements or higher ratios for capital transactions in foreign than local currency. These measures are often used with a macro-prudential intent, aimed at limiting the build-up of currency mismatches. The widespread use of this new type of measure as well as discussions on motivations and impact were analysed in earlier empirical work by the OECD (De Crescenzo et al 2015). This was followed by discussions at the OECD and the IMF on whether CBMs should be considered prudential or capital flow management measures (OECD & IMF 2015, 2016). The hypothesis that CBMs may act *de facto* as capital controls was confirmed in further empirical work (De Crescenzo et al 2017), demonstrating that the tightening of CBMs in the post-crisis period contributed to reduce the external debt of banks, especially short-term debt and interbank borrowing. Less research exists on the role of these types of policies and financial stability indicators, which will be one contribution of this paper. A recent exception is the paper by Ahnert et al (2018), who find that CBMs are effective in terms of reducing borrowing in FX by banks and the sensitivity of banks to exchange rate movements but have the side effect of causing firms to increase FX debt issuance.

Overall, the empirical evidence on the effectiveness of financial policies is mixed and remains a work in progress. Guichard (2017) claims one of the main explanations for these mixed results is the different types and measures of data across studies, she points to the need to reconcile different databases and approaches to give consistent conclusions. The studies use a variety of data sources, time periods and country samples so it is difficult to compare results. In light of the proliferation of studies on this topic, there is a need to harmonise the literature by taking a holistic approach to the financial policy toolkit across three broad headings RBMs, CBMs and MPMs, with clear definitions of the policy variables in a single analytical framework. This paper tries to get closer to this ideal.

3. CONCEPTUAL FRAMEWORK: FINANCIAL POLICIES AND FINANCIAL STABILITY

This paper takes an integrated approach to the financial policy toolkit across the three broad headings RBMs, CBMs and MPMs, and looks at its effectiveness on capital inflows and credit growth, a key financial stability variable (Schularick and Taylor 2012, Aikman et al 2015). It takes this integrated approach, in light of the recent consideration of a broader policy toolkit to address systemic risk, potentially including residency-based measures – a motivation not traditionally associated with (or accepted for) the use of RBMs. This section briefly outlines the main channel of transmission on the effectiveness of each specific tool.

Addressing systemic risk has two dimensions: (1) increasing the resilience of the financial system in case of shock, (2) mitigating the build-up of vulnerabilities. The paper focuses on the impact of financial policies on variables describing the upswing of the financial cycle- credit growth and capital inflows, similar to most of the literature. Thus, the second channel – the effectiveness in *mitigating the build-up of vulnerabilities* – will be the focus of this research.

Macro-prudential tools are traditionally split between borrower-based tools, capital-related tools, large exposure limits and liquidity tools. CBMs can be split between measures that are targeted at FX assets, FX

liabilities, FX derivatives or FX position limits. RBMs can be split on the cross-border operation they target: direct investment, portfolio equity and bonds, derivatives, or loans.

Borrower-based tools will act directly on credit growth, with most of these tools concerned with mortgage credit. Banks will need to directly implement tighter lending criteria before granting new loans and will thus lend less to riskier borrowers, or lend a lower volume to each borrower and hence less overall.

Capital-related MPMs require banks to hold more capital in general (Basel requirements), along the cycle (Countercyclical capital buffers), depending on sectoral allocation of assets (increase in sectoral risk weights), or the size of the institution (add-ons for systemically important institutions).

Generally, capital requirements act more on the resilience of the financial system; they are buffers that can be used in case of shocks. They will have an impact on credit growth insofar as banks have less money to lend but banks could adjust their balance sheets. MPMs are not expected to have a significant impact on reducing capital inflows themselves to the country, however they may lead to capital flow spillovers to other countries (Avdjiev et al 2016).

CBMs are measures, which impose a stricter treatment on FX assets and liabilities compared to local currency. They aim to tackle specific vulnerabilities coming from the volatility of the exchange rate, i.e. currency mismatches to the balance sheets of the banks or vulnerabilities for households to borrow in FX. They act either on the liabilities of the bank, the liquidity and riskiness of their funding. They may also in this way discourage cross border capital inflows insofar as most of external funding is provided in FX. They can also act on the asset side, the type of risky assets that they can provide. The latter will act more generally on credit growth, particularly if it is FX mortgage lending which is targeted.

RBM can affect financial stability indicators through a number of channels. This paper is concerned with capital inflows and credit growth. There is a wide literature linking the role of capital inflows and credit and asset price booms. Considering first these policies and capital inflows, if they are effective, it is anticipated that their imposition or tightening leads to a reduction in capital inflows. Secondly, capital inflows and credit, this can happen through two main channels: one aspect is domestic banks borrow overseas increasing their liabilities, this is passed through at home via increased loan issuance (or assets for the banks) resulting in greater credit pressures in the market. Alternatively, banks can issue bonds to access greater liquidity and similarly facilitate greater lending domestically. Both of these aspects would likely be reflected in higher credit growth.

Following the above reasoning, the introduction, removal or adjustment of capital flow management measures would likely be reflected in both capital inflows and credit growth.

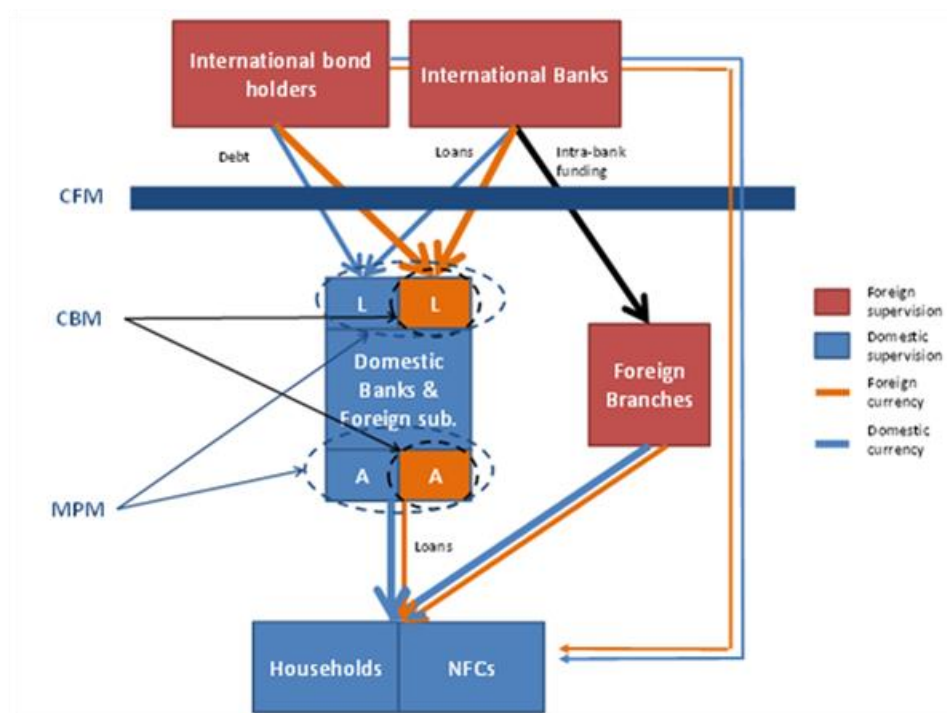
Figure 1 illustrates the main channels of the flows of credit within an open economy as well as how the different financial policies are affecting credit through which channel of transmission.

Domestic households and non-financial corporates (NFC) can get credit and funding from different sources: 1) domestic banks, 2) foreign subsidiaries, 3) foreign branches, 4) domestic non-banks, or 5) directly cross border from international banks and international bondholders. Domestic banks themselves in order to be able to lend to the domestic economy need to get funding either from domestic depositors (i.e. core funding), from other domestic banks or non-banks, from international bank lending or on international wholesale markets by issuing bonds.

Most of the funding from international markets and banks is likely to be in foreign currency (orange arrows). In particular, most of them are in predominant global currencies, mainly in US dollars. Most of the domestic credit granted by domestic banks will be in local currency (blue arrows), except for highly dollarized economies.

Domestic banks and foreign subsidiaries are covered under domestic supervision, while foreign branches established in the country are usually not covered by domestic prudential tools.

Figure 1. Stylised sketch of financial policies and transmission channels



Note: The middle box represents a stylized bank balance sheet, “A”= Assets, “B”=Liabilities. “NFC”=Non-Financial Corporates.

MPMs are the local foundations of the system; which are aimed at increasing the resilience of the domestic banking sector, or mitigating the build-up of vulnerabilities along the financial cycles. They can act on both the asset (A) and the liability (L) side of the bank balance sheets with the objective to make them safer.

CBMs act like fences, they are not working on the overall asset or liabilities of banks but will try to filter flows as fences may do, incentivizing the use of local currency instead of FX.

RBMs in contrast act like fire doors, they block cross border flows, flows from the outside. Indeed, this can be done for all cross border flows or on specific operations, the granular level of the policy database enables a thorough examination of this question.

It is expected that these tools will have different effects on capital flows and financial stability – both in terms of magnitude or targeted variables. The new policy database allows for such a split, with the full granularity of the database described in Section IV and reflected in Figure 2.

4. DATA DISCUSSION

This section describes the construction of a new policy database, presents stylized facts on recent policy trends, and describes the control variables used in the empirical analysis.

4.1. Building an integrated database of financial policies

With the aim of disentangling the respective effects of RBMs, CBMs and MPMs on capital inflows and financial stability this paper compiles the most comprehensive database on these three types of policies covering 39 countries for the period 2000 to 2015. The country sample included in the regressions is listed in the Appendix Table A1.

Our classification of MPM, CBM, RBM does not take any normative stance, avoiding most of the complex discussion happening in international fora. It does not take into account any criteria of intent; instead, it is based on the simple and objective criteria of the type of discrimination involved.

A measure is coded an MPM when it does not treat foreign currency or foreign residents more strictly than domestic currency or residents. A measure is coded a CBM when there is differentiated treatment regarding currency. Finally a measure is coded an RBM when it treats non-residents in a stricter manner than residents. This classification is objective, in line with most of the literature (Ostry et al 2011, Claessens in OECD 2017) and consistent with the policy databases used.

Following the literature on measuring RBMs, CBMs and MPMs, the focus is not on the presence of these measures, but whether they have been introduced, removed, eased or tightened during the period. Until recently, the literature mainly looked at the presence of a measure, rather than policy changes. This can result in misleading findings, especially as countries are often progressively liberalising their capital account rather than all at once; or (counter) cyclically adjusting tools depending on circumstances. This practice of changes in policy has been recognised by De Crescenzo et al (2015), Ahmed et al. (2016), Cerutti et al (2016), Zhang et al (2014), Beirne et al (2017) and others as a more appropriate method to analyse the effects of these policies. Admittedly, this approach does not deal fully with the issue of intensity. Some policy changes may be stronger than others, so although the direction and the frequency of adjustments in measures is captured, the database does not capture their strength.

For each policy type, the data are collected following the same consistent method that is becoming standard in the literature on effectiveness: a removal or easing of a policy measure is coded as -1 and the introduction or tightening of a measure as +1 – hence looking at all episodic changes. The policy data is available at daily- frequency. In the context of this work, the changes are then aggregated at the quarterly level.

The data on RBMs is built following this method too, also consistent with the method proposed by Ahmed et al (2015). The main source of the data is the yearly changes sections of the IMF AREAER reports, specifically Section XI “Capital Transactions”. This report provides qualitative information on every policy change classified by the type of operations affected: e.g. capital and money market instruments, derivatives, credit operations, direct investment etc. The data is classified according to these detailed subcategories and according to whether they restrict inward or outward operations. The most granular level of data available provides 22 subcategories of measures. Where possible the collected data is cross-checked with other sources (Pasricha et al 2015, Forbes et al 2015, Schindler et al 2015, Ahmed et al 2015, and ESRB database). This data collection substantially expands previous efforts in granularity, number of countries, and length of time series: Ahmed et al (2015) collected data for 19 EMEs until 2012 solely on controls on inflows, Pasricha et al (2018) and Pasricha (2017) datasets cover both inflows and outflows controls for 18 EMEs.

A secondary contribution of the database is that these residency-based measures are coded as either episodic or structural; this enables to focus on the active use of RBMs (among which RBMs taken with potential prudential motives) in the below empirical strategy. This involves reading the measure in the AREAER report and determining whether the measure was introduced, removed or adjusted as part of a long-term structural movement independent of the business or financial cycle. For many emerging countries, this is relatively obvious, there tends to be waves of liberalisation in the data. For example, countries pass new laws, which may cover a large number of financial transactions, or operations that are now open to non-residents or raise the limits on their participation. For episodic uses of these measures, that the focus is on whether the measure was introduced in response to economic developments, and then subsequently removed. This is the case for most observations in the sample, the policy is introduced, i.e. a control limiting cross border borrowing, it might be eased and then later is removed.

Table 1. Policy variable sources

Policy variables		
Indicators	Description	Data source
Currency Based Measures (CBM)	Policies affecting FX assets, FX liabilities, net FX positions and FX derivatives	De Crescenzo et al (2015) ; De Crescenzo et al (2017)
Prudential measures	Sectoral capital buffers (real estate, consumer credit, other sectors), cap requirements (Basel), concentration limit, interbank exposure limit, loan to value caps	Cerutti et al (2015)
Prudential measures	Liquidity requirements, DTI caps and other lending standards	Kuttner and Shim (2016), Shim et al (2013)
Reserve requirements	Single reserve requirements and reserve requirements differentiated by currency	Federico et al (2014)
Residency based controls (RBM)	Authors' calculations based on the IMF AREAER	Authors' calculations

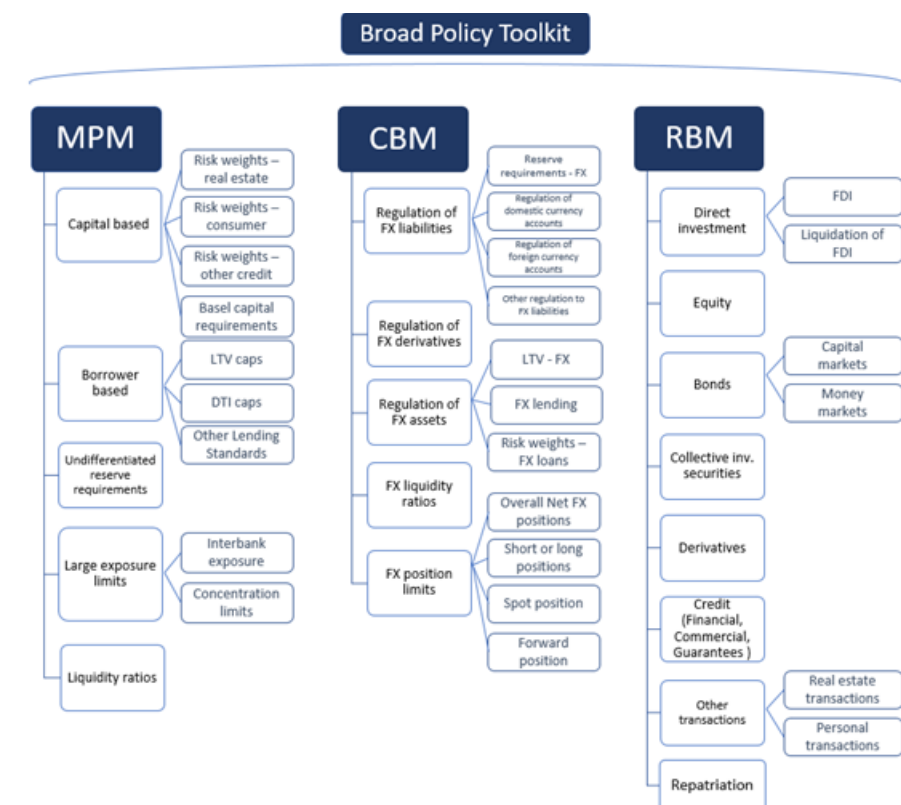
With regards to Currency Based Measures, this paper leverages on previous OECD work, coded in the same way. De Crescenzo et al (2015) presents a unique database of CBMs directed at banks. It is a database of *de jure* measures defined as bank regulations discriminating on the basis of the currency of an operation, i.e. measures that apply more stringent restrictions to operations in a certain currency (typically foreign currencies). The data is available for 49 countries for the years 2005-2013. The authors note that the use of CBMs during the pre-crisis period were mainly conventional measures such as regulation of the net FX lending position of banks, while post crisis measures such as taxes on FX liabilities or rules limiting FX derivatives were introduced. Some categories of measures covered are restrictions on currency accounts, regulation of FX derivatives transactions, reserve requirements on FX liabilities.

For macro-prudential policies, the database combines elements of the databases of Cerutti et al (2016) and Kuttner and Shim (2016). Both cover large country samples and are coded in a consistent way with other variables. Most importantly, they provide descriptions of the coded policy changes, which is particularly crucial to avoid any overlap between databases and to be able to compile the policy database at any frequency. From Cerutti et al (2016) Basel capital rules, interbank and concentration limits, loan to value limits and sectoral risk weights (on real estate, on consumer credit ...) are used., DTI, other lending criteria and liquidity ratios are used from Kuttner and Shim (2016).

Finally, the database of Federico et al (2014) is used to collect data on two types of reserve requirements: non-differentiated reserve requirements (classified in the database as an MPM) and reserve requirements differentiated by currency (classified in the database as a CBM). The data is adjusted and coded as tightening / easing at each change of the reserve requirements rates. The databases are then harmonized in

order to remove any duplicates between databases, and to reclassify exceptional cases of measures that would fit in the classification under a different category.

Figure 2. Description of the three types of financial policies



Our merged sample of policy instances is converted into a panel at quarterly frequency. The number of changes is summed up in each quarter within each subcategory of regulation. Aggregates and sub-aggregates for each of the three policy types, RBMs, CBMs and MPMs, and episodic RBMs are also created. Figure 2 above provides the final and complete breakdown of the policy database.

Table 2 presents the number of policy adjustments in the database per type of policy. The final database captures a substantial number of data points, which strengthens the empirical effort, particularly for RBMs. Data on outflows controls is reported here for the reader's interest, but this paper is only concerned with inflows.

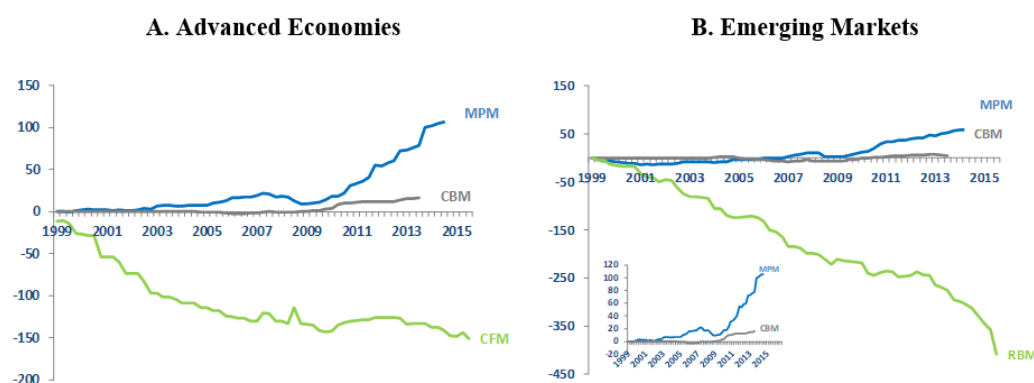
Table 2. Number of policy adjustments per type of measure

RBM	1593	MPM	573	CBM	162
RBM inflow - FDI	88	Basel capital requirements	100	Reserve requirements in FX	46
RBM - FDI liquidation	7	DTI	23	Regulation of FX accounts	14
RBM inflow - bond capital market	90	Large exposure interbank	24	Regulation of local currency accounts	5
RBM inflow - bond money market	80	Large exposure intragroup	32	Regulation of FX lending	24
RBM inflow - collective investment securities	43	LTV	97	Regulation on FX derivatives	25
RBM inflow - credit	138	Lending criteria	15	Regulation on FX liabilities	5
RBM inflow - derivatives	77	Liquidity ratios	22	FX liquidity ratios	12
RBM inflow - equity	72	Reserve requirements	189	Regulation of FX positions	21
RBM inflow - other personal transactions	16	Risk weights - residential real estate	48	Risk weights on FX	10
RBM inflow - real estate	45	Risk weights - consumer credit	10		
RBM outflow - FDI	83	Risk weights - other	12		
RBM outflow - FDI liq	7	Risk weights - commercial real estate	1		
RBM outflow - bond capital market	149				
RBM outflow - bond money market	121				
RBM outflow - collective investment securities	115				
RBM outflow - credit	94				
RBM outflow - derivatives	94				
RBM outflow - equity	137				
RBM outflow - other personal transactions	47				
RBM outflow - repatriation	22				
RBM outflow - real estate	68				

4.2. Stylised facts on the use of financial policies

This section presents key stylised facts from the database. Figure 3 illustrates the cumulative aggregates for the three financial policy measures for 1999-2015. The upward trend for MPMs illustrates the increase in their use since 2009 for both advanced and emerging markets. This is also the case for the implementation and tightening of CBMs since 2009. Reflecting the substantial capital account liberalisation by emerging markets, their magnitude of RBM easing is almost double than the magnitude for advanced countries.

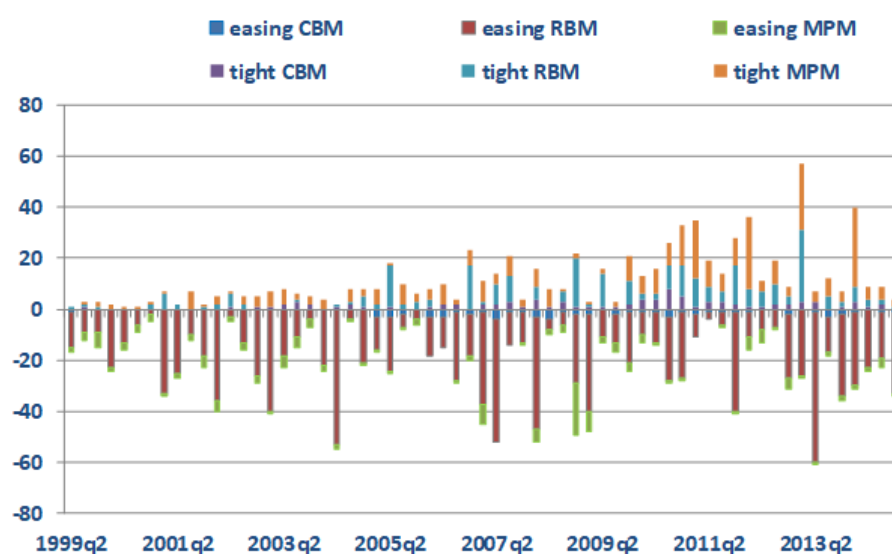
Figure 3. Cumulative change in financial policies for advanced and emerging economies, 1999-2015



Note: The easing or the removal of a financial policy is coded as -1; the tightening or introduction of a financial policy is coded as +1. The small chart in pane B zoom in the use of MPMs and CBMs specifically.

Source: Authors' calculation, based authors' collection for the RBMs, Cerutti et al (2016) and Kuttner and Shim (2016) for the MPMs, De Crescenzo et al (2015) for the CBMs, Federico et al (2014) for reserve requirements.

Figure 4. Quarterly adjustment in financial policies for the full sample, 1999-2015

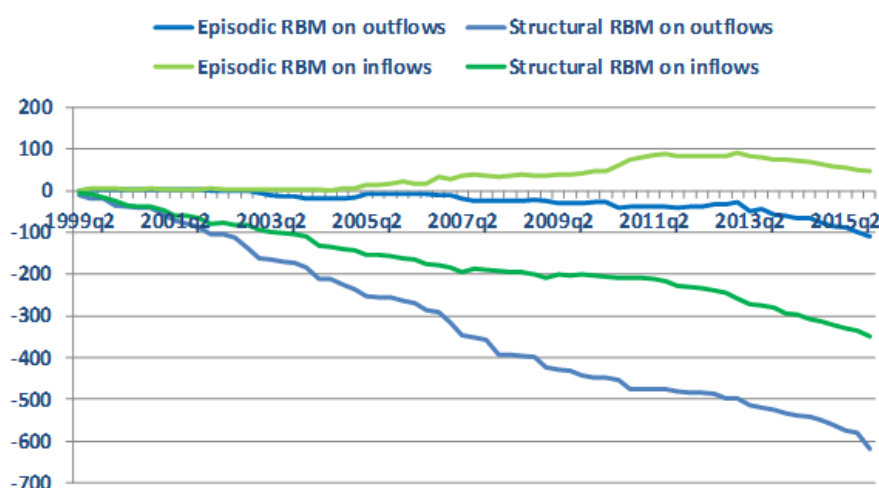


Note: The easing or the removal of a financial policy is coded as -1; the tightening or introduction of a financial policy is coded as +1.

Source: Authors' calculation, based authors' collection for the RBMs, Cerutti et al (2016) and Kuttner and Shim (2016) for the MPMs, De Crescenzo et al (2015) for the CBMs, Federico et al (2014) for reserve requirements.

Figure 4 presents the quarterly adjustment of financial policies in our country sample. It illustrates notably the proliferation of macro prudential policy actions in the years following the crisis, with a temporary and unsurprising easing of macro prudential tools during the crisis. Figure 4 also outlines the more frequent use of RBM policies in the post crisis years, demonstrating that this use concerns mainly episodic RBM on inflows.

Figure 5. Structural vs. Episodic capital flow management measures, 1999-2015



Note: Authors' calculation, based authors' collection for the RBMs.

Source: Cumulative changes. The easing or the removal of a financial policy is coded as -1; the tightening or introduction of a financial policy is coded as +1.

Figure 5 introduces a crucial split in the database, looking solely at the RBM data, measures were coded as episodic policy changes if they have been adjusted over time, typically in response to contemporaneous macroeconomic or financial conditions and cycles. These measures were introduced or tightened and then subsequently eased or removed. Alternatively, measures were coded as structural, whether or not they were part of a structural shift towards capital account liberalisation.³ In other words, they were unrelated to macroeconomic and financial circumstances, and were instead part of a gradual opening of the capital account. The series of episodic RBMs is used in this paper. The paper investigates whether these measures are effective in reducing capital inflows, which can lead to a build-up of vulnerabilities, and whether they are effective in tempering credit growth.

The paper reflects anecdotal observations of the use of RBMs, whereby episodic changes in RBMs mainly concerned capital inflows and occurred in recent years. This use was in the context of large capital inflows to emerging economies due to interest rate differentials, and the rise of global liquidity. The structural changes in RBMs capture the well-known constant trend of capital account liberalisation in most countries over the last two decades. The distinction between these two series highlights the need to dig deeper into capturing the use of RBMs in empirical work.

4.3. Capital flows, financial stability and control variables

The analysis uses the IMF BOP data for capital inflows. When measuring capital inflows, portfolio debt and equity inflows and other investment inflows are summed. FDI inflows are excluded from the total flows variable for a number of reasons. The motivations behind FDI inflows admittedly differ from those of portfolio and banking inflows. FDI is associated with long-term investment, while portfolio and other investment or banking flows are fickle. The interest rate differential and exchange rate in a country are of greater importance to the latter flows than for FDI, which can be more explained by the long-term potential of an economy. FDI, by its nature is acquiring a significant (more than 10%) stake in a business often a longer-term horizon, it is a more stable flow and less prone to the exuberance and stops that can arise with portfolio and banking flows. This distinction is important for the corresponding relationship with financial policy variables. As a robustness check, the model is also estimated including FDI inflows.

Credit growth is used as the main proxy for the build-up of vulnerabilities as commonly used in the literature. It is important to note that the BIS credit data captures all sources of credit, independent of the country of origin or the type of lender, hence covering both cross-border and domestic flows.

Country level controls (interest rates, exchange rates, GDP growth and the VIX), are collected from the BIS, IMF and OECD. These controls are typical to this literature. In robustness checks, the VIX is replaced with the FED funds rate without modifying the results. Full data sources and details are provided in the Annex, Table A1.

³ or a structural shift to financial closure in rarer cases – there may be cases where the liberalisation overshoot and countries deem needed the reintroduction of specific controls which they intend at the time to keep for a long period of time.

5. EMPIRICAL SPECIFICATION & AGGREGATE ANALYSIS

5.1. The model

This section details the empirical approach used to investigate the use of financial policy measures (RBMs, MPMs and CBMs) and how they relate to developments in capital inflows and credit growth. The following baseline regression models is used to analyse this issue:

$$Y_{it} = \sum_{k=0}^3 \beta \text{policy_instrument}_{it-k} + \sum_{k=0}^3 \beta \text{other policies within same type}_{it-k} + \sum_{k=0}^3 \beta \text{other policy types}_{it-k} + \Gamma X'_{it-1} + u_i + e_{it} \quad (1)$$

$$Y_{it} = \alpha Y_{it-1} + \sum_{k=0}^5 \beta \text{policy_instrument}_{it-k} + \sum_{k=0}^5 \beta \text{other policies within same type}_{it-k} + \sum_{k=0}^5 \beta \text{other policy types}_{it-k} + \Gamma X'_{it-1} + u_i + e_{it} \quad (2)$$

Y_{it} captures the dependant variable, and will represent successively two selected aspects of the build-up of vulnerabilities – the analysis first looks at capital inflows capturing the cross-border exposure. It then turns to total credit growth (domestic and cross-border), most commonly used as proxy for financial stability in the literature on early warning systems of financial crises and on effectiveness of financial policies. It is total credit to the private non-financial sector deflated by the CPI, measured as year on year growth.

When estimating the model for capital inflows equation (1) is used. For credit growth as dependent variable, the lag of the dependant variable is included as a regressor and equation (2) is estimated. This dynamic element is introduced as an additional control to account for potential effects of variables, such as market structure, that may be relevant and are not included in the estimation. The significance and magnitude of the lagged dependant variable also suggests how stable credit growth, is in an economy. Previous studies (Cerutti et al 2016) have found this relationship to be larger for advanced than emerging countries, suggesting perhaps greater stability in credit markets of advanced countries.

$\text{policy_instrument}_{it-k}$ is the policy variable that represents changes in the use of macro-prudential, currency-based or residency-based measures. The variable captures changes in the policy measures, taking a value of +1 if a restriction is introduced or tightened, 0 if no change and -1 if a restriction is removed or loosened in that quarter. To account for the likely time lag between the introduction and effects of these policies, the contemporaneous value and three lags of the policy indicator are included and their joint effect is evaluated by testing if the sum of all coefficients is significantly different from zero⁴ for the capital flow estimation. For the credit growth model, the last four lags of the policy adjustment is used instead of the contemporaneous value, consistent with the credit growth literature. For robustness and to enable comparison with other studies, the model is also run with simply one lag of the policy variable to check the results.

This lagged approach is selected as there is also likely to be differences across policies in the time before they become effective. For example, policies that directly affect the lending capabilities of banks may have a more immediate effect on credit, while policies that can affect credit indirectly through other channels

⁴ Following the approach of Ahnert et al. (2018).

likely have a longer lag between implementation and effect. Policymakers want instruments to have a lasting effect on financial stability variables, not only a short-term one and one that is not easily circumvented. Testing the joint significance of the four lags of the policy variable allows the same empirical specification used across each policy.

The empirical analysis is conducted at two levels of detail regarding the policy variable. First, the equation is estimated on aggregate indices of the three policy types - RBM, CBM and MPM. However, the database allows a much more granular analysis. The second level of analysis investigates the policy changes within policy type. Within RBMs, for instance, instead of one aggregate RBM index, results are provided separating the effect of changes in restrictions in FDI, portfolio equity or bonds, and credit. In order to have a sufficient number of observations (or incidences of the use of policy types) to estimate the regressions, Table 3 reports the policy breakdowns and sub elements contained in each group, that are used in the regression analysis for each financial policy type. At this granular level, the effect of episodic RBMs are reported in addition rather than only the aggregate RBM series.

The model considers the effectiveness of one sort of policy, controlling for adjustments in other policies. For instance, when analysing the effect of residency-based measures on credit growth, the model controls for policy adjustments in MPMs, CBMs and also other RBMs. As a pre-cursor the correlations of the introduction across policy types are analysed to see how likely it is that policies are introduced together. Given that different regulatory or supervisory bodies may administer these policies, it is not obvious *a priori*, if they are linked, however this will likely depend on the type of policies. These correlation tables are reported in the Annex (Table A2), for ease of interpretation, only statistically significant correlations at the 5% level are reported. For CBMs, positive correlation is found within CBM policies being adjusted simultaneously, weakly so with some RBM policies, and no correlation with MPMs. There is little common adjustment within MPMs, or with MPMs and CBMs. There are some positive links with MPMs and RBM adjustment. Finally, for RBMs, there is positive correlation within the policy type, indicating policymakers often adjust them together.

Table 3. Granular policies included in the regression analysis

Macro Prudential Measures⁵	Currency Based Measures	Residency Based Measures
Capital Based: Risk weights, (consumer, real estate other credit) Basel capital requirements	FX Liabilities: Regulation of domestic and/or foreign currency accounts, other regulation of FX liabilities, FX liquidity ratios	Bond (inflows): capital and money market bonds
Large exposure limits: interbank exposure and concentration limits	FX assets: LTV in FX, FX lending and risk weights in FX loans	Equity (inflows)
Lending standards: Loan to value (LTV) caps, (Debt to income) DTI caps, other lending standards	FX positions: overall net FX positions, spot, forward and short or long positions	Credit (inflows): Financial, commercial and guarantees.
Liquidity ratios	FX derivatives	
Reserve Requirements	FX Reserve requirements	

X_{it-1} is a vector of controls that include both country specific and global factors.

⁵ “Macroprudential tools” are in this paper defined broadly: e.g. Basel capital requirements relate mostly to microprudential policy, and single reserve requirements may be used for monetary policy and not prudential purposes. While being aware of these distinctions, a single broad term is used to classify these policies throughout the paper. The point was not to have a detailed discussion on what constitute or not a truly macro prudential tool but rather make use of all the possible policy data commonly used in the literature on macroprudential policy.

GDP growth in the previous year. This variable will reflect how capital inflows and credit behaviour (or other financial stability variables) are related to economic developments. It is a widely used “pull” factor for capital inflows in the literature. It is also a proxy for credit demand in the economy. Following the literature, a positive relationship between GDP growth and credit growth is expected.

In equation (1) the differential of the domestic interest rate with the Fed Funds rates used as a control. This captures how relatively attractive the yield on capital inflows are in a country. Model (1) also includes the growth of the exchange rate vis a vis the USD as a control. These two controls are consistent with the literature for estimating capital inflows.

Equation (2) is estimated with the domestic policy rate of the Central Bank. It controls for the monetary policy stance of the country. A negative relationship between credit growth and the domestic policy rate is expected: when interest rates rise, the cost of borrowing is increased, and conversely, a reduced interest rate makes borrowing cheaper and saving less attractive.

The log of the VIX to take into account global factors common to all countries in each period. Indeed time fixed effects could be used instead; this alternative is used as a robustness check.

These control variables are lagged by one quarter to reduce endogeneity concerns. u_i is a country fixed effect to capture any non-time varying country specific conditions. This includes characteristics such as economic and financial development, the concentration of its financial system, the existing state of regulation or institutions in the economy, and the level of capital controls at the first period. This is relevant because the aggregate level of capital controls is not controlled for in the regression specification, as it will be covered in the country fixed effects. Finally, e_{it} is an error term.

Equation (1) is estimated using a panel fixed effects OLS model. Estimation of model (2) which is dynamic with lagged credit as regressor presents a number of challenges; firstly, the use of the within transformation with a lagged dependant variable means the demeaned lagged dependant variable is correlated with the error term. This would lead to a bias of the fixed effects estimator, however given the relatively long time series of 60 quarters (2000-2015) the amount of bias should be small.

An additional issue for both types of model is endogeneity; the policy measures are likely endogenous with the financial stability outcomes, these policies are often introduced in response to a risk of increased credit growth or indeed, when the credit cycle is at its peak. Countries that experienced high levels of credit growth might have introduced such policy measures, introducing a reverse causality effect. However, there is reason to believe that such bias should lead to an underestimate of the coefficients (see Kuttner and Shim 2016).

5.2. Financial policies and financial stability: Aggregate Results

First, the empirical specification is run with aggregate measures of RBM, CBM and MPM on capital inflows and total credit growth. In order to simplify the interpretation of the results, the coefficients of the policy variables are reported as the sum of the quarterly coefficient estimates (the significance test is based on a p-value indicating if the sum is jointly significant). These are written in bold to clarify that they are distinct from the other coefficient estimates reported with standard errors. The complete results are reported in Table A3 in the Annex.

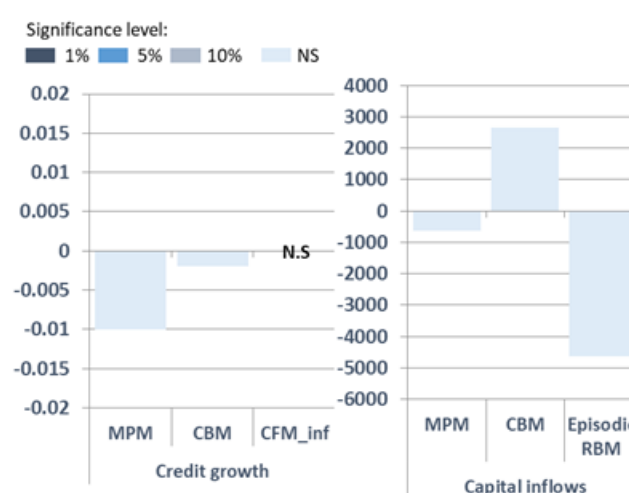
Starting with the control variables for the estimation of model (1) and capital inflows, consistent with the literature, the VIX emerges as a consistently significant explanatory variable for capital inflows across policy regressions. This is consistent with the idea that push factors are important determinants of capital flows: in times of high volatility, capital flows reduced. In some specifications, there is evidence that pull factors such as GDP growth and the change in the exchange rate vis a vis the dollar can help explain capital flows. Higher growth is associated with greater capital inflows. However, these findings were more often evident in the robustness checks using a sample split of pre and post crisis periods.

For the estimation of equation (2) and credit growth, the lagged dependent variable is positive and highly significant in all regressions, indicating persistence in credit movements at the country level and justifying the use of a dynamic panel empirical setting. The magnitude of the coefficient is consistent with other studies that have looked at financial policies in a dynamic panel setting. The interest rate controls for the monetary policy stance of the economy, as anticipated, a negative relationship is present in the data. The negative relationship is significant across all specifications; higher interest rates are associated with less credit growth. The growth rate of GDP is included to account for credit demand, as expected; higher GDP growth is positively associated with credit growth. The VIX is included to control for global factors that are common to all countries. Greater risk aversion (higher values of the VIX) is associated with less credit growth, while periods of low risk aversion are associated with more growth. As a robustness check, the FED funds rate is added to capture global liquidity; the main findings were consistent.

Turning to the aggregate policy results for both capital inflows and credit growth, displayed in Figure 6 for ease of interpretation: the darker the shading of the column indicates a higher level of statistical significance (10%, 5% 1%); only a shape outline indicates no statistical significance.

For capital inflows, Figure 6 reports the joint coefficients for the joint significance of the contemporaneous and three lags of the policy variable; while for credit growth the four lags of the policy variable. The darker the shading of the column indicates a higher level of statistical significance; only a shape outline indicates no statistical significance.

Figure 6. Aggregate analysis – Effect of financial policies on capital flows and credit growth



Note: For credit growth, the estimates are calculated as the sum of the coefficients from the four lags of the policy variable; significance is determined by a joint test of the four policy lags. For capital flows, the estimates are calculated as the sum of the coefficients from the contemporaneous and the three lags of the policy variable; significance is determined by a joint test of the contemporaneous and the three lags of the policy variable. The regressions are performed for the period 2000-2015 using quarterly data; robust standard errors clustered at country level are in brackets.

The results indicate that at the aggregate level, there are no significant links between capital inflows and the different policy types, nor is there any significant link between credit growth and the different policy types. This may not be surprising, given the aggregation of the policies, and actually supports the objective of this paper: looking in granular detail at the policy types, which is the focus of the next section. It has to be noted again that results are likely to be underestimates of the true coefficients because of the potential endogenous adjustment of policy (e.g. introduced when flows and credit growth are already high). Thus, the lack of a statistical relationship in these results does not imply no relationship.

6. FOUNDATIONS, FENCES, AND FIREDOORS: GRANULAR RESULTS

This Section presents granular results on the effectiveness of different types of MPMs, CBMs, and RBMs on both capital inflows and credit growth.

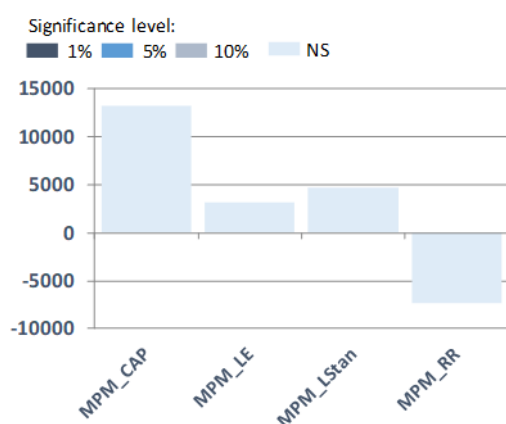
6.1. Foundations: Macroprudential policies, capital inflows, and credit growth

Starting with the impact of MPMs on **capital inflows**, a priori, when controlling for the use of other financial policies, MPMs are not expected to have a significant relationship with capital inflows. This is confirmed in Figure 7 below and Table A4, and consistent with the literature. None of the five MPM policies tested is significantly associated with capital inflows. This holds for both the individual contemporaneous and lagged values of the policies, and their joint significance.

Next, Figure 8 below and Table A5 in the Annex displays the results disaggregated by MPM type on **credit growth**, which is a common target of macroprudential policy and a key indicator of financial stability. Overall and as expected, MPMs have a negative impact on credit growth. The two objectives of macroprudential policy are to increase resilience and mitigate the build-up of vulnerabilities, among which credit is a key target.

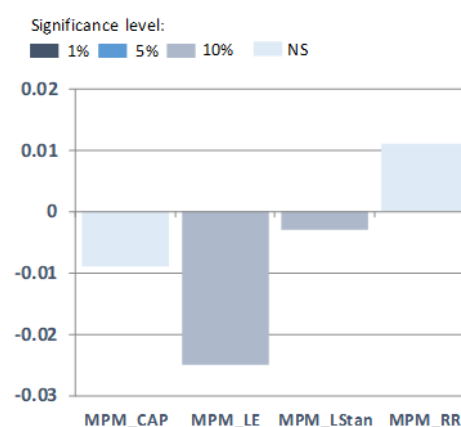
Measures related to lending standards appear to have a negative and significant relationship with credit: measures such as LTV and DTI caps as well as softer lending standards recommendations will mainly impact the composition of the loans away from risky ones but should also impact the volume, which is reflected here. Large exposure requirements appear to have the largest negative effect. Concentration limits are limiting the fraction of assets held by a limited number of borrowers, and interbank exposures limits are limiting the fraction of liabilities held by the banking sector. They target the financial system's large exposures but may also have an indirect impact on the volume of credit. Limited room for manoeuvre on the funding side may lead to costlier funding, which will be transmitted to the asset side of the balance sheet; similarly, limits on credit to particular borrowers may limit overall credit. Capital requirements and capital based measures such as risk weights have a negative effect but not statistically significant. They represent bank capital or cash set aside which cannot be used for lending. While it could have been expected that reserve requirements diminish credit growth, the coefficients are positive and not significant (a result found also in BIS 2018).

Figure 7. MPMs and Capital Inflows



Note: The estimates are calculated as the sum of the coefficients from the contemporaneous and the three lags of the policy variable; significance is determined by a joint test of the contemporaneous and the three lags of the policy variable. The regressions are performed for the period 2000-2015 using quarterly data. CAP are capital related macroprudential tools, LE are large exposure tools, LStan are lending standards and limits, RR are undifferentiated reserve requirements.

Figure 8. MPMs and Credit growth



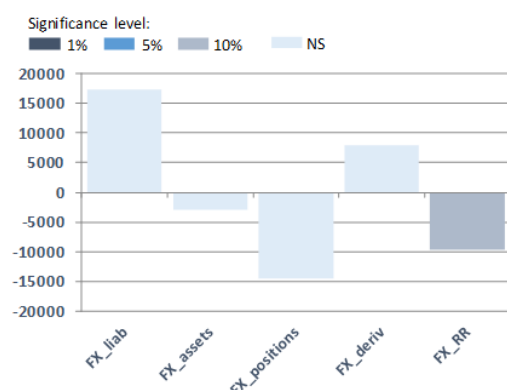
Note: The estimates are calculated as the sum of the coefficients from the four lags of the policy variable; significance is determined by a joint test of the four policy lags. The dependant variable is total credit to the private non-financial sector deflated by the CPI, measured as year on year growth. The regressions are performed for the period 2000-2014 using quarterly data; robust standard errors clustered at country level are in brackets. CAP are capital related macroprudential tools, LE are large exposure tools, LStan are lending standards and limits, RR are undifferentiated reserve requirements.

6.2. Fences: Currency-based measures, capital inflows, and credit growth

Turning now to CBMs (Fences), Table A6 displays their impact on **capital inflows**. Considering the tests of joint significance with the contemporaneous value of the policy variable of interest and its three lags, Figure 9 shows that only the adjustment of FX reserve requirement policies is negatively associated with capital inflows. Thus, introducing or raising (tightening) reserve requirements on FX liabilities controlling for the adjustment of other policies, and the main push and pull factors, leads to reduced capital inflows. FX reserve requirements appear to act as a fence to capital inflows to the economy. In contrast, policies on FX assets, liabilities, positions or derivatives do not significantly impact capital inflows for this group of countries or time period.

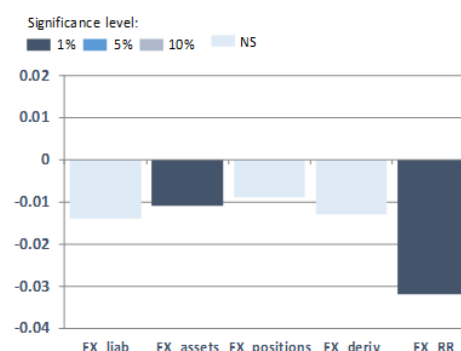
Digging further into the results, the next steps investigate whether this holds for the pre and post crisis period. Policies on assets denominated in FX are found to possibly act as a fence to capital inflows in the pre- crisis period. In other words, those countries that introduced or tightened policies on FX assets in the pre- crisis period saw a significant reduction in capital inflows in the run up to the crisis. The financial channel would operate through balance sheet effects. There is no joint significance of the other FX policies in the pre or post crisis periods.

Figure 9. CBMs and Capital Inflows



Note: The estimates are calculated as the sum of the coefficients from the contemporaneous and the three lags of the policy variable; significance is determined by a joint test of the contemporaneous and the three lags of the policy variable. The regressions are performed for the period 2000-2015 using quarterly data. FX_liab are regulations on banks' FX liabilities, FX_assets of FX assets, FX_positions of FX positions, FX_deriv of FX derivatives, FX_RR are reserve requirements differentiated in FX.

Figure 10. CBMs and Credit growth



Note: The estimates are calculated as the sum of the coefficients from the four lags of the policy variable; significance is determined by a joint test of the four policy lags. The dependant variable are respectively total credit to the private non-financial sector deflated by the CPI, measured as year on year growth. The regressions are performed for the period 2000-2014 using quarterly data; robust standard errors clustered at country level are in brackets. FX_liab are regulations on banks' FX liabilities, FX_assets of FX assets, FX_positions of FX positions, FX_deriv of FX derivatives, FX_RR are reserve requirements differentiated in FX.

Turning now to the impact of CBMs on **credit growth**, Figure 10 above and Table A7 in the Annex displaying the effects of various categories of currency-based measures on credit growth. A tightening of CBMs appears to have an overall negative and significant effect on credit growth.

FX reserve requirements are strongly associated with lower credit growth, with the effect being substantial. This provides evidence of a potential macroprudential motive for FX reserve requirements as described in OECD (2018) and Montoro and Moreno (2011). FX reserve requirements are here defined as reserve requirements, which set a higher reserve ratio for liabilities denominated in foreign currency than liabilities denominated in local one – thus incentivizing a shift to local currency funding. Along the conceptual framework, as funding can be both local and cross border, the latter of which is very likely to be in foreign currency, a tightening of FX reserve requirements will not only shift the funding mix but also increase the overall funding costs of banks. Higher funding costs will lead to balance sheet effects, which can result in lower credit on the asset side. Restrictions on FX assets – mostly restrictions on FX lending – also have a substantial and significant negative impact on credit growth as outlined in the above framework. Again, while a direct impact is expected on the loan composition (in local and foreign currency), such restrictions should also impact the volume of credit provided to the economy.

Restrictions on FX derivatives, regulations of FX positions, and restrictions on FX liabilities all display a negative but not statistically significant impact. This may be expected, as the transmission to credit appear less obvious. While measures on FX liabilities may be used for prudential reasons and may have an impact on credit growth via balance sheet effects, the policy data for this type of measures mainly consists in regulations on FX accounts, representing more traditional exchange controls than prudential tools.

6.3. Fire doors: Residency-based measures, capital inflows, and credit growth

Finally, this section analyses the relationship between residency-based restrictions (RBMs), capital inflows (which they are designed to try to stop), and credit growth (which would highlight potential financial stability benefits). One of the main contributions of the data is that it allows a deeper delve into different types of RBMs, the model is thus estimated on the series of RBMs that were used episodically. In other words, the model is estimated on a sub sample that strips out the use of these policies exogenous to the macroeconomic environment in the country, i.e. capital account liberalisation due to a long-term agenda.

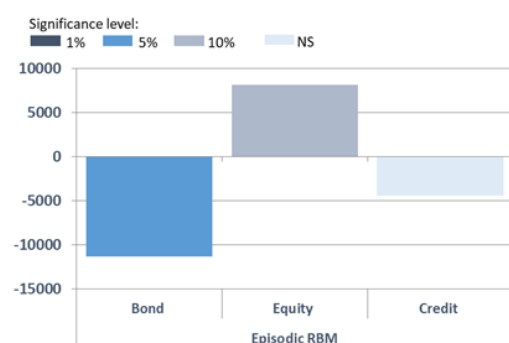
Table A8 and Figure 11 below report results for the impact of episodic adjustments of RBMs on **capital inflows**. The episodic tightening or introduction of residency-based measures on portfolio bonds has a significant negative effect on capital flows. This implies that when policymakers tightened these measures they reduced total inflows to the country; they acted as a fire door and blocked the inflow. The effect of tightening policies on equity inflows is not as clear-cut. Controlling for other policy adjustments and pull and push factors, the tightening of policies on equity inflows are associated with an increase in capital inflows. This result is somewhat surprising, and highlights the unintended effects the use of RBMs can have.

Finally, the episodic use of residency-based measures on credit does not appear to explain capital inflows to an economy. However, on closer inspection, this does not hold for the pre-crisis period, the tightening of credit inflow RBMs before the GFC is significantly associated with a reduction in capital inflows. Interestingly, this did not hold for the post crisis period.

Next, in keeping with the granular mapping of policy and outcome, results are presented in Figure 12 matching the restriction with the flow type they are supposed to stop. . The left hand side variable is replaced by portfolio equity, debt and other capital inflows in model (1) to see whether the episodic use of measures affect the specific flows they are aiming to target rather than the total inflows to the country⁶. Detailed results are reported in the Table A9-A11. At first glance, there is no joint significance looking at the impact of the measure to the flow it is supposed to restrict. As highlighted earlier, these estimates are likely under-estimates. Measures on portfolio bonds appear negatively associated with a reduction in inflows of portfolio debt, with a p – value of 0.16; furthermore, there is a spill-over to other inflows, where measures on portfolio debt had a p value of 0.12. While both results are just outside the significance band used in this paper of 10%, it is important to flag that measures on portfolio debt have a weakly significant effect on capital inflows. Indeed, measures on portfolio debt appear a greater deterrent to capital inflows than measures targeted at equity or credit.

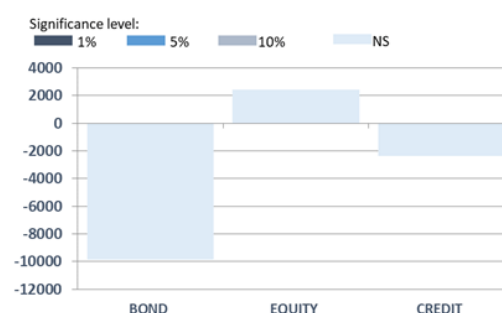
⁶ For space constraints, results are reported here for the specific measure and targeted flow (portfolio debt, equity and other investment inflows) the full results are included in the annex.

Figure 11. Episodic RBMs and Total Capital Inflows



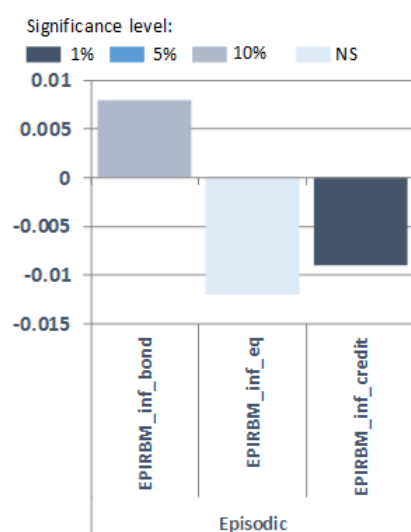
Note: The estimates are calculated as the sum of the coefficients from the contemporaneous and the three lags of the policy variable; significance is determined by a joint test of the contemporaneous and the three lags of the policy variable. The regressions are performed for the period 2000-2015 using quarterly data

Figure 12. Episodic RBMs and Inflow by flow type



Note: The estimates are calculated as the sum of the coefficients from the contemporaneous and the three lags of the policy variable; significance is determined by a joint test of the contemporaneous and the three lags of the policy variable. The regressions are performed for the period 2000-2015 using quarterly data

Figure 13. Episodic RBMs and Credit growth



Note: The estimates are calculated as the sum of the coefficients from the four lags of the policy variable; significance is determined by a joint test of the four policy lags. The dependant variable is total credit to the private non-financial sector deflated by the CPI, measured as year on year growth. The regressions are performed for the period 2000-2014 using quarterly data; robust standard errors clustered at country level are in brackets. These regressions are based on episodic residency based measures restricting bond inflows, equity inflows, and credit inflows respectively.

This finding is relevant in light of the distinct effect debt and equity inflows can have on an economy. Debt inflows can create more vulnerabilities in an economy than equity inflows, debt inflows are associated with credit growth, which can result in financial instability. Here episodic measures targeted specifically

at equity are not significant (joint test of significance with a p value of 0.27) and indeed have a positive coefficient, while the episodic use of measures on debt can be effective to temper capital inflows (p-value of 0.16).

Turning now to testing a potential prudential role for RBMs, as proxied by its capacity to smooth **credit cycles**, Figure 13 above and Table A12 in the Annex reports the results for the estimates at the detailed policy level of RBMs respectively targeting inflows of bonds, equity and credit. The present paper is interested in the toolkit that policymakers have to address the build-up of risks, hence focusing on the sample of episodic RBMs, which are actively adjusted along the cycle. Controls on credit inflows are associated with lower credit growth, which is expected and consistent with the presented conceptual framework as the credit data used covers not only domestic credit to non-financial private sector but also cross border credit. This suggests that the episodic use of RBMs on cross border credit can affect financial stability through the credit growth channel. Controls on equity inflows display a negative but not significant coefficient, while controls on bond inflows have a weakly significant positive impact on credit. This may be explained by likely spill-over effects to other classes of assets as demonstrated by recent research on spill-overs and circumvention of controls.

This analysis presents an overall mixed picture on the impact of RBMs on credit growth with the exception of a potential prudential role for episodic controls on credit flows, which may be expected.

7. CONCLUDING REMARKS

This paper looked at three types of financial policies that directly or indirectly affect capital flows and how these policies can affect credit growth or financial stability more broadly. There is increased discourse for the prudential and countercyclical use of various financial policies including residency-based measures. This research contributed to this debate by analysing in a single analytical framework the effectiveness of three types of financial policies – macroprudential tools (foundations), currency-based measures (fences), and residency-based measures (fire doors).

The paper presents a newly constructed database of financial policy actions for these three policy measures at the granular level, on a quarterly basis, for a sample of advanced and emerging economies. The database captures quarterly policy adjustments over fifteen years. In addition, it splits the series on residency-based measures into those associated with structural behaviour i.e. long-term capital account liberalisation, and those used episodically, or in response to macroeconomic conditions.

Equipped with such a policy database, the effect of financial policies is tested first, on capital inflows and then on a common financial stability indicator, i.e. credit growth. Residency-based measures on bonds and credit appear to reduce capital inflows, particularly when used episodically. Policies on equity inflows can have unintended effects on inflows (positive coefficient). The results show no evidence that macroprudential measures alter capital inflows, while they demonstrate that reserve requirements on FX liabilities reduce inflows. Similarly, measures targeting FX assets also tempered inflows pre-crisis.

Second, the results present some renewed evidence of the effectiveness of macroprudential tools in reducing credit growth (particularly lending standards and large exposure limits); new evidence on the prudential role of currency-based measures (particularly FX reserve requirements and regulations of FX lending), and mixed evidence for a credit-mitigation role for residency-based measures.

The present paper argues for a move away from aggregate indices, which do not allow for disentangling the impacts of different types of measures, as the effects vary in magnitude, and often direction, across policy type, highlighting different channels of transmission.

In terms of policymaking, it points to the need to look at the financial policy toolkit in a holistic and granular manner, matching the specific policy with the targeted objective, and collect further evidence of benefits as well as externalities of each specific tool.

There are several important areas where further research on financial policies is needed.

First, the present analytical framework and policy database may be tested on other financial stability indicators, as policies have very specific and different targets. Future work may provide a deeper look into the role of financial policies on a broader range of financial stability variables, such as asset price growth (stock and house prices) and bank exposures, via FX liabilities, or FX mismatch.

A related challenge is the understanding of unintended effects of financial policies, with spill-overs, either geographical, sectoral, or across asset classes. While research on policy spill-overs has been developing recently, particularly on MPMs and to some extent CFMs, a consistent approach across the three types of policy would be most beneficial.

Finally, the question of the need for and optimal form of international coordination of policies in the face of international spill-overs from financial policies⁷ will remain unsettled until answers are provided to the above issues.

⁷ The international capital flow spillovers from adjustments of financial policies will be the focus of a separate paper.

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ANNEX A

TABLE A1: VARIABLE SOURCES & COUNTRY SAMPLES

Variable Sources & Country Samples		
Indicators	Description	Data source
Capital Inflows	The sum of portfolio debt and equity inflows and other inflows.	Balance of Payments
Total Credit to private non-financial sector (real)	Credit, deflated by CPI	BIS, IMF IFS
Exchange rate v/v the USD	The average USD dollar exchange rate with the domestic currency series from the BIS is used. The Q on Q growth rate of the series is generated to capture how the exchange rate is appreciating or depreciating relative to the dollar. This series is used in the estimation of the capital inflows model.	BIS
Policy Rate	The policy rate is used for the estimation of the credit growth model, the differential between the domestic policy rate and the US FED Funds rate is used for estimation of the capital inflows model.	IMS IFS
Real GDP Growth	Quarterly real GDP growth	IMF IFS
VIX	Implied quarterly volatility	Bloomberg
Capital flow regression country sample	Argentina, Australia, Austria, Brazil, Canada, Chile, Colombia, Denmark, Finland, France, Germany, Greece, Hungary, India, Indonesia, Ireland, Italy, Japan, Korea, Mexico, Netherlands, Poland, Portugal, Russia, South Africa, Spain, Sweden, Thailand, Turkey, United Kingdom, United States.	
Credit growth regression sample	Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China, Colombia, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, India, Indonesia, Ireland, Italy, Japan, Korea, Luxembourg, Malaysia, Mexico, Netherlands, Poland, Portugal, Russia, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, United Kingdom, United States.	

Table A2: Correlation of implementation across policy types

	Probability of a change in:													
	MPM_CAP	MPM_LE	MPM_LStan	MPM_Liq	MPM_RR	FX_liab	FX_assets	FX_positions	FX_deriv	FX_RR	CFM_inf_FDI	CFM_inf_bond	CFM_inf_eq	CFM_inf_credit
Conditional on a change in:														
MPM_CAP	...										-0.031**			
MPM_LE		...									0.012**			
MPM_LStan			...											
MPM_Liq	-0.084***			...										
MPM_RR					...									0.326*
FX_liab						...	0.087**			0.515***			0.158*	
FX_assets						0.189**	...							
FX_positions								...						0.226*
FX_deriv									...					
FX_RR										...				
CFM_inf_FDI	-0.054**	0.006***									...	0.239***	0.466***	0.188**
CFM_inf_bond						0.053*					0.057**	...	0.403***	0.553***
CFM_inf_eq						0.036*	0.013*				0.129***	0.472***	...	0.209***
CFM_inf_credit	0.026***			-0.002***	0.056***							0.238**	0.077*	...

Table A3: Aggregate analysis: Financial policies, capital flows and credit growth

Credit growth	(1) MPM	(2) CBM	(3) CFM_inf	(5) MPM	(6) CBM	(5) CFM_inf
MPMs (t-1 to t-4)	-638.915			-0.002		
CBMs (t-1 to t-4)		2659.947			-0.01	
RBM (t-1 to t-4)			-2812.856			0
Interest rate (t-1)				-0.183*** 0.02	-0.182*** 0.02	-0.182*** 0.02
IR differential (t-1)	3,241.279 5,640.59	3,068.771 5,734.82	3,088.747 5,722.29			
Gdp Growth (t-1)	6,349.631 35,187.69	11,748.244 51,740.61	7,142.148 35,377.45	0.207*** 0.07	0.279*** 0.07	0.203*** 0.07
VIX (logged)	-42,724.347*** 14,034.44	-42,402.792*** 13,701.27	-43,388.924*** 14,058.32	-0.048*** 0.01	-0.050*** 0.01	-0.048*** 0.01
Exchange rate growth (t-1)	1,195.717 27,930.61	4,072.553 29,110.48	-1,282.816 28,018.15			
Constant	148,779.455*** 42,925.23	147,707.755*** 41,922.52	150,627.514*** 43,034.27	0.161*** 0.02	0.164*** 0.02	0.160*** 0.02
Country Fixed Effects	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y
Observations	1,848	1,720	1,848	2,250	2,136	2,250
R-squared	0.074	0.075	0.074	0.198	0.190	0.199
Number of ifs_code	32	32	32	39	39	39

Note: the dependent variable on Column 1-3 is capital inflows, while on Column 4-6 is credit growth.

Table A4: Effect of different MPMs on Capital Inflows

Capital Inflows	(1) MPM_CAP	(2) MPM_LE	(3) MPM_LStan	(4) MPM_Liq	(5) MPM_RR
Policy Variable (t to t-3)	13135.48	3178.93	4652.15	-47268.00	-7279.43
MPMs excluding Policy (t to t-3)	-1811.157	2296.827	1471.961	2473.496	7125.081
RBM on inflows (t to t-3)	-2995.74	-3101.96	-2966.507	-3038.745	-2136.595
CBMs (t to t-3)	4760.254	4730.462	5047.598	6354.306	5375.174
Interest Rate Differential with Fed Funds (t-1)	2,478.881 5,704.51	2,847.704 5,753.76	3,197.552 5,889.17	3,411.606 5,853.43	785.182 6,004.95
Ex rate growth v/v USD (t-1)	228.642 29,576.41	2,696.972 29,755.98	4,290.535 29,449.37	1,588.293 29,518.46	4,518.919 29,755.16
Gdp Growth (t-1)	9,878.522 53,532.84	10,965.692 52,927.83	10,064.824 53,495.92	11,002.948 53,297.30	8,773.389 53,194.07
VIX (logged)	-42,863.671*** 14,105.15	-42,356.439*** 14,008.10	-42,614.599*** 14,023.48	-42,461.577*** 13,999.26	-42,879.874*** 14,049.45
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	1,720	1,720	1,720	1,720	1,720
R-squared	0.077	0.076	0.076	0.076	0.077
Countries	32	32	32	32	32

Note: The estimates are calculated as the sum of the coefficients from the contemporaneous value and three lags of the policy variable; significance is determined by a joint test of the four variables. The constant is not reported. The regressions are performed for the period 2000-2014 using quarterly data, robust standard errors clustered at country level are in brackets. ***, **, * indicate significance at the 1, 5, and 10 percent levels respectively.

Table A5: Effect of different MPMs on credit growth

Credit growth	(1) MPM CAP	(2) MPM LE	(3) MPM LStan	(4) MPM RR
Policy Variable (t-1 to t-4)	-0.009	-0.025*	-0.003*	0.011
MPMs excluding Policy (t-1 to t-4)	0.001	0.003	0	-0.008
RBMs on inflows (t-1 to t-4)	0*	0.001*	0.001*	-0.001*
CBMs (t-1 to t-4)	-0.011*	-0.011*	-0.011*	-0.01*
Interest rate (t-1)	-0.182*** 0.02	-0.184*** 0.02	-0.183*** 0.02	-0.179*** 0.02
Gdp Growth (t-1)	0.284*** 0.07	0.282*** 0.07	0.280*** 0.07	0.277*** 0.07
VIX (logged)	-0.050*** 0.01	-0.050*** 0.01	-0.050*** 0.01	-0.050*** 0.01
Constant	0.165*** 0.02	0.167*** 0.02	0.165*** 0.02	0.166*** 0.02
Country Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	2,136	2,136	2,136	2,136
R-squared	0.195	0.195	0.193	0.195
Number of ifs_code	39	39	39	39

Note: The estimates are calculated as the sum of the coefficients from the four lags of the policy variable; significance is determined by a joint test of the four policy lags. The dependant variable are total credit to the private non-financial sector deflated by the CPI, measured as quarterly growth. The model is dynamic and includes four lags of the dependent variable (not reported). The regressions are performed for the period 2000-2014 using quarterly data, robust standard errors clustered at country level are in brackets. ***, **, * indicate significance at the 1, 5, and 10 percent levels respectively.

Table A6: CBMs and Capital Inflows

Capital Inflows	(1) FX_liab	(2) FX_assets	(3) FX_positions	(4) FX_deriv	(5) FX_RR
Policy Variable (t to t-3)	17332.88	-2880.33	-14455.984	7942.952	(-)9706.044**
CBMs excluding Policy (t to t-3)	-7067.46	3018.069	4351.04	1075.592	4609.729
MPMs (t to t-3)	2799.131	2383.492	2368.708	2174.805	2587.027
RBMs on inflows (t to t-3)	-2918.66	-2955.28	-3094.71	-3026.83	-3225.603
Interest Rate Differential with Fed Funds (t-1)	3,092.507 5,797.62	3,121.615 5,820.08	3,226.725 5,886.12	3,106.779 5,758.79	3,232.315 5,795.61
Ex rate growth v/v USD (t-1)	2,978.320 29,199.44	1,777.726 29,803.09	3,582.817 28,367.96	1,979.185 29,517.62	2,856.705 29,347.32
Gdp Growth (t-1)	8,326.794 53,271.08	8,928.199 53,053.32	13,974.955 51,924.66	8,939.004 53,087.23	10,293.937 53,380.35
VIX (logged)	3,234.291* 14,213.76	2,621.792* 14,058.40	-42,920.335*** 14,208.23	2,604.612* 14,043.86	-42,454.280*** 14,034.51
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	1,720	1,720	1,720	1,720	1,720
R-squared	0.076	0.076	0.077	0.076	0.076
Number of ifs_code	32	32	32	32	32

Note: See Table A4

Table A7: Effect of different CBMs on credit growth

Credit growth	(1) FX_liab	(2) FX_assets	(3) FX_positions	(4) FX_deriv	(5) FX_RR
Policy Variable (t-1 to t-4)	-0.005	-0.011***	-0.009	-0.013	-0.032***
CBMs excluding Policy (t-1 to t-4)	-0.018*	-0.012**	-0.012***	-0.012**	-0.009
MPMs (t-1 to t-4)	0	-0.001	0	0	0
RBM on inflows (t-1 to t-4)	0.001*	0.001	0.001*	0.001	0.001*
Interest rate (t-1)	-0.185*** 0.02	-0.186*** 0.02	-0.186*** 0.02	-0.186*** 0.02	-0.188*** 0.02
Gdp Growth (t-1)	0.281*** 0.07	0.283*** 0.07	0.281*** 0.07	0.282*** 0.07	0.287*** 0.07
VIX (logged)	-0.050*** 0.01	-0.050*** 0.01	-0.050*** 0.01	-0.050*** 0.01	-0.050*** 0.01
Constant	0.166*** 0.02	0.165*** 0.02	0.166*** 0.02	0.166*** 0.02	0.166*** 0.02
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	2,136	2,136	2,136	2,136	2,136
R-squared	0.194	0.195	0.194	0.194	0.195
Number of ifs_code	39	39	39	39	39

Note: See Table A5

Table A8: RBMs on Capital Inflows

Capital Inflows	(1) Bond	(2) Equity	(3) Credit	(1) Episodic Bond	(2) Episodic Equity	(3) Episodic Credit
Policy Variable (t to t-3)	-4581.364	9422.185	(-)5091.554*	(-)11276.842**	8153.194**	-4394.841
RBM excluding Policy (t to t-3)	-2407.78	(-)5492.875**	-341.971	3275.131	-7989.953	(-)4113.473*
MPMs (t to t-3)	2599.047	3660.904	3920.362	1090.752	1434.969	1502.377
CBMs (t to t-3)	4529.281	-115.48	5136.206	3893.855	5138.562	4303.625
Interest Rate Differential with Fed Funds (t-1)	3,014.530 5,715.56	2,265.943 5,775.91	2,859.205 5,940.61	3,002.465 5,747.10	3,010.095 5,739.78	3,172.209 5,907.56
Ex rate growth v/v USD (t-1)	1,959.567 29,552.66	4,418.566 29,527.39	3,281.622 29,598.39	964.010 29,631.08	1,703.132 29,563.03	788.333 29,579.42
Gdp Growth (t-1)	9,743.813 53,437.73	12,979.119 52,096.23	10,923.677 52,755.35	13,383.751 50,813.91	15,854.289 50,586.33	12,293.162 51,509.23
VIX (logged)	-42,670.641*** 14,059.42	-42,786.590*** 14,092.85	-42,530.466*** 14,030.06	-42,749.938*** 14,062.47	-42,662.053*** 14,043.36	-42,684.901*** 14,044.61
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,720	1,720	1,720	1,752	1,752	1,752
R-squared	0.076	0.077	0.076	0.076	0.076	0.076
Number of ifs_code	32	32	32	32	32	32

Note: Note: See Table A4 “RBMs excluding policy” for Columns 4 to 6 refers to other types of episodic RBMs.

Table A9: RBMs on Capital Inflows: Portfolio Debt

Portfolio Debt Inflows	(1)	(2)	(3)
	Episodic Bond	Episodic Equity	Episodic Credit
Policy Variable (t to t-3)	-1891.8	1547.4	1014.2
	0.16	0.29	0.82
RBMs excluding Policy (t to t-3)	863.6	-1231.5	-1355.8
	0.84	0.06	0.00
MPMs (t to t-3)	2409.1	2415.3	2423.4
	0.94	0.94	0.93
CBMs (t to t-3)	4382.5	4567.7	4185.7
	0.46	0.44	0.44
Interest Rate Differential with Fed Funds (t-1)	95.765	157.920	163.667
	1,734.33	1,676.75	1,681.96
Ex rate growth v/v USD (t-1)	12,735.468	12,816.511	12,728.395
	12,762.96	12,718.65	12,691.83
Gdp Growth (t-1)	25,475.284	25,839.411	25,307.679
	27,542.75	27,692.22	27,867.16
VIX (logged)	-14,639.497***	-14,650.366***	-14,659.983***
	3,736.49	3,738.56	3,736.94
Country Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Observations	1,694	1,694	1,694
R-squared	0.04	0.04	0.04
Number of ifs_code	31	31	31

Note: See Table A4

Table A10: RBMs on Capital Inflows: Portfolio Equity

Equity Inflows	(1)	(2)	(3)
	Episodic Bond	Episodic Equity	Episodic Credit
Policy Variable (t to t-3)	-216.622	3603.226	-853.329
	0.358565853	0.267908782	0.417564877
RBMs excluding Policy (t to t-3)	1406.499	-78.951	791.507
	0.562076444	0.932796863	0.124036732
MPMs (t to t-3)	-318.113	-294.681	-211.789
	0.572531744	0.551894892	0.590837878
CBMs (t to t-3)	276.806	452.661	468.103
	0.148624196	0.147425761	0.205297308
Interest Rate Differential with Fed Funds (t-1)	-877.734	-875.165	-838.714
	1375.06	1395.63	1345.99
Ex rate growth v/v USD (t-1)	9584.163	9741.594	9604.128
	6226.28	6099.75	6207.09
Gdp Growth (t-1)	30,410.548*	30,505.265*	30,122.221*
	16030.77	16012.58	16026.41
VIX (logged)	-7,173.539***	-7,156.910***	-7,191.538***
	2575.17	2571.95	2569.62
Country Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Observations	1694	1694	1694
R-squared	0.04	0.04	0.04
Number of ifs_code	31	31	31

Note: See Table A4

Table A11: RBMs on Capital Inflows: Other Inflows

Other Inflows	(1)	(2)	(3)
	Episodic Bond	Episodic Equity	Episodic Credit
Policy Variable (t to t-3)	-9870.4 0.12	2438.3 0.67	-2376.7 0.42
RBMs excluding Policy (t to t-3)	2451.9 0.73	-6468.9 0.24	-5977.2 0.35
MPMs (t to t-3)	582.1 0.93	916.2 0.92	863.1 0.91
CBMs (t to t-3)	-280.9 0.56	653.9 0.49	-71.1 0.60
Interest Rate Differential with Fed Funds (t-1)	4,292.299 6,290.15	4,286.419 6,326.32	4,352.121 6,417.71
Ex rate growth v/v USD (t-1)	-20,638.018 34,836.19	-20,240.071 34,635.98	-20,921.198 34,820.69
Gdp Growth (t-1)	-28,860.253 36,130.90	-27,045.349 35,583.15	-29,594.261 36,698.79
VIX (logged)	-21,841.750** 10,595.19	-21,763.718** 10,568.78	-21,742.479** 10,569.66
Country Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Observations	1,694	1,694	1,694
R-squared	0.04	0.04	0.04
Number of ifs_code	31	31	31

Note: See Table A4

Table A12: Effect of different RBMs on credit growth

Credit growth	(1)	(2)	(3)	(4)	(5)	(6)
	RBM inf bond	RBM inf eq	RBM inf credit	EPI RBM inf bond	EPI RBM inf eq	EPI RBM inf credit
Policy Variable (t-1 to t-4)	-0.003	-0.004	0.003***	0.008	-0.012	-0.009***
RBMs excluding Policy (t-1 to t-4)	0.002	0.001***	-0.001	-0.011***	0.002**	0.003**
MPMs (t-1 to t-4)	-0.001	0	-0.002	0	0	0
CBMs (t-1 to t-4)	-0.012**	-0.01**	-0.01**	-0.011	-0.01	-0.009
Interest rate (t-1)	-0.184*** 0.02	-0.184*** 0.02	-0.184*** 0.02	-0.183*** 0.02	-0.183*** 0.02	-0.182*** 0.02
Gdp Growth (t-1)	0.283*** 0.07	0.282*** 0.07	0.283*** 0.07	0.282*** 0.07	0.281*** 0.07	0.290*** 0.07
VIX (logged)	-0.050*** 0.01	-0.050*** 0.01	-0.050*** 0.01	-0.050*** 0.01	-0.050*** 0.01	-0.050*** 0.01
Constant	0.165*** 0.02	0.167*** 0.02	0.166*** 0.02	0.165*** 0.02	0.166*** 0.02	0.164*** 0.02
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,136	2,136	2,136	2,136	2,136	2,136
R-squared	0.193	0.193	0.194	0.194	0.193	0.195
Number of ifs_code	39	39	39	39	39	39

Note: See Table A5

ANNEX B. OECD WORKING PAPERS ON INTERNATIONAL INVESTMENT

www.oecd.org/investment/working-papers.htm

2019

2019/01 The determinants of Foreign Direct Investment protection and the right to regulate in investment treaties: A scoping paper

2018

2018/1 Societal benefits and costs of International Investment Agreements: A critical review of aspects and available empirical evidence

2017

2017/5 Adjudicator Compensation Systems and Investor-State Dispute Settlement

2017/4 Have currency-based capital flow management measures curbed international banking flows?

2017/3 Addressing the balance of interests in investment treaties: The limitation of fair and equitable treatment provisions to the minimum standard of treatment under customary international law

2017/2 The balance between investor protection and the right to regulate in investment treaties: A scoping paper

2017/1 Foreign direct investment, corruption and the OECD Anti-Bribery Convention

2016

2016/3 State-to-State dispute settlement and the interpretation of investment treaties

2016/2 Investment policies related to national security

2016/1 The legal framework applicable to joint interpretive agreements of investment treaties

2015

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2015/2 Investment Treaties over Time - Treaty Practice and Interpretation in a Changing World

2015/1 The Policy Landscape for International Investment by Government-controlled Investors: A Fact Finding Survey

2014

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2013

2013/4 Temporal validity of international investment agreements: a large sample survey of treaty provisions

2013/3 Investment treaties as corporate law: Shareholder claims and issues of consistency

2013/2 Lessons from Investment Policy Reform in Korea

2013/1 China Investment Policy: an Update

2012

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2012/2 Dispute settlement provisions in international investment agreements: A large sample survey

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2011

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2010

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2010/1 Intellectual property rights in international investment agreements

2006

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2006/2 Investor-State Dispute Settlement in Infrastructure Projects

2006/1 Improving the System of Investor-State Dispute Settlement: An Overview

2005

2005/3 Corporate Responsibility Practices of Emerging Market Companies - A Fact-Finding Study

2005/2 Multilateral Influences on the OECD Guidelines for Multinational Enterprises

2005/1 Transparency and Third Party Participation in Investor-State Dispute Settlement Procedures

2004

2004/6 Mobilising Investment for Development: Role of ODA - The 1993-2003 Experience in Vietnam

2004/5 ODA and Investment for Development: What Guidance can be drawn from Investment Climate Scoreboards?

2004/4 Indirect Expropriation and the Right to Regulate in International Investment Law

2004/3 Fair and Equitable Treatment Standard in International Investment Law

2004/2 Most-Favoured-Nation Treatment in International Investment Law

2004/1 Relationships between International Investment Agreements

2003

2003/2 Business Approaches to Combating Corrupt Practices

2003/1 Incentives-based Competition for Foreign Direct Investment: The Case of Brazil

2002

2002/2 Managing Working Conditions in the Supply Chain: A Fact-Finding Study of Corporate Practices

2002/1 Multinational Enterprises in Situations of Violent Conflict and Widespread Human Rights Abuses

2001

2001/6 Codes of Corporate Conduct: Expanded review of their contents

2001/5 The OECD Guidelines for Multinational Enterprises and other corporate responsibility instruments

2001/4 Public policy and voluntary initiatives: What roles have governments played?

2001/3 Making codes of corporate conduct work: Management control systems and corporate responsibility

2001/2 Corporate Responsibility: Results of a fact-finding mission on private initiatives

2001/1 Private Initiatives for Corporate Responsibility: An Analysis

2000

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