Global Liquidity and Capital Flow Regulations* †

Dr. Nataliia Osina

Alliance Manchester Business School

July 15, 2019

Abstract

After the Global Financial Crisis, the usage of capital controls and macroprudential policies have returned and become an essential element of the policy paradigm in different countries. However, our knowledge on the effectiveness of these policy instruments is still insufficient and requires serious empirical reconsideration. The main contribution of our paper is in identifying that capital controls (on both outflows and inflows) and macroprudential instruments are effective measures in reducing the volume of cross-border banking flows in a sample of 112 countries over the period 2000—2016. Using panel regressions incorporating country fixed effects, we find that FX and/or countercyclical reserve and countercyclical capital buffer requirements, reserve requirement ratios and concentration limits are the most effective macroprudential instruments to manage countries' exposures to global liquidity fluctuations. Additionally, capital surcharges on SIFIs, limits on interbank exposures and foreign currency loans are also associated with a large reduction in flows, a finding which contributes to the literature by emphasizing the importance of macroprudential instruments aimed at financial institutions' assets or liabilities. However, leverage ratios, limits on domestic currency loans, levy/tax on financial institutions, and other borrower related instruments appear to be insignificant regulatory measures. At times of large and volatile cross-border capital flows it is desirable to employ both capital controls and macroprudential policies, with latter tend to be generally more effective measures in reducing the volume of cross-border banking flows. The results are robust to changes in the estimation methodology and varying sets of the control variables.

Keywords: Global Liquidity, Capital Flow Regulations, Capital Controls, Macroprudential Policies, Effectiveness, Volume of Cross-border Banking Flows.

---

* Presented at the 12th Annual Doctoral Conference (Northern Advanced Research Training Initiative NARTI) hosted by Newcastle University Business School, 6-7 June 2017. I also would like to thank conference participants at the Alliance Manchester Business School Conference, May 2017, Talent Workshop at IE Business School, Spain 3-4 November 2017, BAFA ANNUAL MAIN CONFERENCE 2018, 9-11 April 2018, Central Hall Westminster, London and 25th International Conference on Forecasting Financial Markets organized by the Saïd Business School (**University of Oxford**), **Saïd Business School**, 5-7 September 2018.

† Address for correspondence: E-mail nataliia.osina@manchester.ac.uk; **nataliiaosina@gmail.com**

1. Introduction

After the Global Financial Crisis, the usage of capital controls and macroprudential policies have returned and become an essential element of the policy paradigm in different countries. However, our knowledge on the effectiveness of these policy instruments is still insufficient and requires serious empirical reconsideration.

With the advancement in trade, financial flows, and network linkages, integration of the capital markets has become a modern reality and so have the risks emanating from the same. The literature is in broad agreement that capital flows can have considerable benefits for countries, including improving efficiency, competitiveness of the financial sector, investments and consumption smoothing (Levy-Yeyati and Zuñiga 2015). However, capital flows may also pose macroeconomic challenges and carry significant risks, which can be enlarged by gaps in countries' financial and institutional policies. In particular, a large volume of capital flows (fear of large inflows), coupled with its volatile and procyclical nature, can trigger a variety of financial and real risks: excessive currency appreciation,[1] dollar liquidity crises, asset price bubbles, and over-indebtedness (Calvo et al. 1994; Ostry et al. 2010; Magud et al. 2011; Levy-Yeyati and Zuñiga 2015). This calls for a pressing need for usage of regulatory policy toolbox containing capital controls and macroprudential instruments to address the systemic nature of these risk factors.

The paper employs quantitative research methods to explore one of the fundamental research questions on capital flow regulations offered by Magud and Reinhart (2007, 2011). Our paper will be the first in the literature to empirically examine whether capital flow regulations can reduce the volume of cross-border banking flows. Most of the previous studies examine the impact of capital controls or macroprudential policies on credit or asset price growth with differentiation on different sectors of the economy such as real estate credit, non-financial corporations and others (Binici et al. 2010, Lim et al. 2011, Cerutti et al. 2015, Bruno et al. 2015). Although Ghosh et al. (2014) offer similar results and examine whether cross-border banking flows can be regulated by imposing capital controls in both source and borrowing countries. We extend these studies by exploring the effectiveness of macroprudential instruments in reducing the volume of cross-border banking flows. We also provide new cross-country evidence on the use and effectiveness of capital controls imposed on different asset classes which other research has somewhat neglected. Segmentation on asset classes is important because, beyond their macroeconomic impacts, cross-border capital flows and particularly certain types of liabilities can bring financial fragility to the economy (Ostry et al. 2010, Eichengreen and Rose 2014).

The main contribution of our paper is in identifying that capital controls (on both outflows and inflows) and macroprudential instruments are effective measures in reducing the volume of cross-border banking flows, and thus systemic risks in a sample of 112 countries over 2000—2016. Although there are few exceptions, namely equity and financial credits inflow restrictions appear to be insignificant regulatory measures. Using panel regressions incorporating country fixed effects, we find that direct investment and equity outflow

[1] Fear of appreciation is defined as the tendency to intervene to depreciate (or to delay the appreciation of) the local currency (Levy-Yeyati and Zuñiga 2015).

restrictions have the highest significance than other types of asset classes, such as the bond, financial credits, money market, derivatives and collective investments outflow restrictions. These results are consistent with pecking order theory on capital flows and are connected with the riskiness of different asset classes.

We provide empirical evidence that FX and/or countercyclical reserve (RR_REV) and general countercyclical capital buffer requirements (CTC), reserve requirement ratios (RR) and concentration limits (CONC) are the most effective macroprudential policies in reducing potentially destabilising cross-border banking flows. This empirical evidence reflects recent developments in Basel III regulations and highlights their effectiveness in raising the resilience of the banking sector in an international dimension. Essentially, Basel III regulations have shown the importance of setting aside bank reserves which may offset adverse effects of systemic risks. Basel III regulations are also aimed at enhancing Tier 1 capital requirements through the greater use of capital buffers. Two types of capital buffers can be introduced across different countries, namely a capital conservation buffer (2.5% of RWA) and a countercyclical capital buffer (from 0% to 2.5% of RWA). The main feature of a countercyclical capital buffer is that it is employed when there is a surplus credit growth in the economies to reduce this credit growth. While capital conservation buffer is designed to be large enough to enable financial institutions to maintain the level of capital above the minimum threshold during periods of downturn. The countercyclical capital buffer is already launched and have its effect on global liquidity conditions while the capital conservation buffer is launched only recently in 2019.

Additionally, capital surcharges on SIFIs (SIFI), limits on interbank exposures (INTER) and foreign currency loans (FC) are also associated with a large reduction in flows, a finding which contributes to the literature by emphasising the importance of macroprudential instruments aimed at financial institutions' assets or liabilities. However, leverage ratios (LEV), limits on domestic currency loans (CG), levy/tax on financial institutions (TAX), and other borrower related instruments are not associated with dampening cross-border banking flows. For instance, in 2016 leverage ratios were set at 3% of Tier 1 capital and were implemented by countries on a test basis with perspective to fully launch the use of leverage ratios in 2018 and 2019. This suggests that implementation of leverage ratios across-countries is at an early stage and this affects the ability of these instruments to reduce the volume of cross-border banking flows.

At times of large and volatile cross-border capital flows it is desirable to employ both capital controls and macroprudential regulations, with latter tend to be generally more effective measures in curbing the volume of cross-border banking flows. We corroborate previous empirical evidence that the effectiveness of capital controls and macroprudential policies vary markedly across different countries and international policy coordination is needed.

We are using a series of robustness checks and different control variables to confirm the validity of my results estimated in the panel regressions with country fixed effects. Panel regressions are complemented by using the method of maximum likelihood (MLE) and the generalised method of moments (GMM) to ensure that the potential issue of endogeneity does not undermine the main inferences.

2. Literature review

The last global financial crisis highlighted the fragility of the global financial system and the need for new approaches to its regulation. We argue that previous literature does not provide persuasive evidence on the effectiveness of capital controls and macroprudential policies in reducing the volume of cross-border capital flows.

2.1 The use and effectiveness of capital controls

Initially, Harry Dexter White (on the U.S. side) and John Maynard Keynes (on the side of the UK) both agreed that restrictions on capital flows should be a fundamental part of an international monetary system (Bretton Woods Agreement, 1944).

The articles of Binici et al. (2010), Baba and Kokenyne (2011) and Ahmed and Zlate (2013) provide only mixed evidence on the effectiveness of capital controls across borders. Binici et al. (2010) show that capital account restrictions on equities and bonds are effective in curbing capital outflows but appear to have been ineffective in curbing inflows. Baba and Kokenyne (2011) make an empirical analysis of case studies and argue that capital controls imposed in certain economies can reduce capital inflows, but this influence tends to be short-lived (e.g. Binici et al. (2010) provide cross-country evidence). While Ahmed and Zlate (2013) show that capital controls are significant regulatory measures in curbing total portfolio inflows. Later on, Cerutti et al. (2014) provide empirical evidence that capital account restrictions on both outflows and inflows can be effective in reducing the level and cyclicality of cross-border banking flows.

As a one step further, Ostry et al. (2010) offer a pecking order theory of capital flows which is connected with the riskiness of different asset classes. The authors offer a decreasing order of riskiness of different asset classes, with measures intended for the short-term period are riskier than long-term measures. For instance, debt in foreign currency and debt in local currency are the riskiest asset classes while equity investments and foreign direct investments (FDIs) are less risky. Levy-Yeyati and Zúñiga (2015) also argue that some flows are much riskier than others, namely FDI are expected to be less volatile and more stable than portfolio flows and especially debt flows versus equity. This suggests that it is much easier to regulate and impose capital account restrictions on those asset classes which are less risky.

In this context, Levy-Yeyati (2011) argue that capital controls should be referred to macroprudential instruments and be used in conjunction with them to avoid inflation in asset prices and overestimation, that is pricey to turn back in the down cycle (Ostry et al. 2010, 2012, Korinek and Sandri 2015). For example, Korinek and Sandri (2015) explore what is better to apply for regulation of capital flows the macroprudential instruments or capital controls. They conclude that it is better to use both instruments because macroprudential instruments may lower excessive borrowing, whereas capital controls may create a flourishing economy with the decent level of savings (Gallagher et al. 2012; Ghosh et al. 2014; Korinek and Sandri 2015, 2016). While

Ostry et al. (2010, 2012) argue that capital controls can complement and should be used alongside, instead of replacing corresponding monetary and macroprudential policies.

Nowadays, the IMF stands for a free movement of goods and services through the current account, but countries should be wide open to imposing capital controls. This corresponds to one of the main pillars of the Bretton Woods Agreement (1944) on capital flow regulations in an international dimension.

2.2 The use and effectiveness of macroprudential policies

The main effects and motivations for usage of macroprudential policies are still not very clear and require further empirical investigation (Claessens 2014). Korinek (2014) claims that we need to employ macroprudential instruments to manage capital mobility across countries for avoidance of future financial crises (IMF 2012, Gallagher and Tian 2014; Ostry et al. 2010).

The early literature on the use and effectiveness of macroprudential policies comprises the studies by such researchers as Borio and Shim (2007), Lim et al. (2011), Habermeier et al. (2011), Qureshi et al. (2012) and Claessens et al. (2014). They argue that macroprudential policies are effective in lowering system-wide risks, however, they might have only a marginal effect on capital flows.

While it is widely acknowledged that large and volatile capital flows can increase the possibility of credit booms and the occurrence of systemic risks in different countries. Claessens (2014) argue that it is still not very clear what macroprudential instruments can influence the volume of cross-border banking flows and as such reduce systemic risks. However, some recent studies suggest that macroprudential instruments might be effective in reducing cross-border capital flows. For instance, Bruno et al. (2015) provide empirical evidence that macroprudential policies are effective regulatory measures in mitigating bank and bond inflows to the Asia-Pacific countries (Bruno and Shin 2014). In turn, Beirne and Friedrich (2014, 2017) provide evidence that the effectiveness of macroprudential regulations in reducing capital flows also relies on the composition of the domestic banking system, such as the regulatory quality or banks' efficiency (Abiad et al. 2009, Papaioannou 2009). These empirical findings largely confirm the theoretical literature on macroprudential policies and their welfare-enhancing character (Lorenzoni 2008, Korinek 2010, Federico 2011, Korinek and Sandri 2015).

3. Research questions and hypotheses development

Using a sample of 112 countries around the world, the paper investigates the impact of capital controls and macroprudential instruments on the volume of cross-border banking flows. This research is motivated by the existence of financial globalisation which synchronises and brings volatility to capital flows across different countries (Reinhart et al. 1993, Ang and Bekaert 2002, Forbes and Warnock 2012). As a result, many countries around the world have encountered difficulties in dealing with large and volatile capital inflows, including

banking flows and short-term debt. Our results support the evidence uncovered in previous studies by Galati and Moessner (2011, 2014), Cerutti et al. (2014, 2015), Bruno et al. (2015) and contribute to the existing literature by investigating two main research questions:

1) Are capital controls imposed on different asset classes effective in reducing the volume of cross-border banking flows?
2) Are macroprudential regulations effective in reducing the volume of cross-border banking flows?

Our research questions allow to formulate the following empirical hypothesis to test in the panel regressions with country fixed effects:

Empirical Hypothesis 1. *Imposing capital controls on different asset classes reduces the volume of cross-border banking flows.*

Empirical Hypothesis 2. *Cross-border banking flows decrease in the level of macroprudential regulations.*

These research questions are of great importance because they allow to work out the most effective regulatory mechanism aimed at preventing systemic/system-wide financial crises. Clearly, an approach to measuring the effectiveness of capital controls and macroprudential instruments is required, as it would coordinate and direct the further development of these instruments (Turner 2010, Galati et al. 2011, Constâncio 2014). Policymakers and economists should bear in mind that imposing capital flow regulations can be costly and carry adverse effects on other countries. This justifies research on capital flow regulations, because if they are not effective then it is not worth to adopt them?

4. Data and research methodology

We apply quantitative research methodology to explore the effectiveness of capital controls and macroprudential instruments in reducing the volume of cross-border banking flows (Cerutti et al. 2014, 2015, Claessens 2014, Freixas et al. 2015). It involves the analysis of large panel data sets (also known as longitudinal or cross-sectional time-series data), and employs panel regression analysis with country fixed effects and clustered standard errors at the country level as the main research method. The BIS Locational statistics allows to explore the contemporaneous impact of both macroprudential policies and capital controls on cross-border banking flows while controlling for a range of country-specific characteristics.

4.1 Data and summary statistics

The sample covers 112 countries for which statistical data is available on an annual frequency starting from 2000 to 2016. Tables 1 and 2 (APPENDIX) offer descriptive statistics of variables and the list of countries included in the regression analyses, respectively.

The empirical analysis is based on the data on cross-border positions reported by banking offices from BIS Locational statistics (Table A6). The Bank of International Settlements' Locational banking statistics (BIS LBS) reflects the obligations (credits, securities, and other claims) of local debtors to overseas banks across different countries. These data are residence-based, namely, domestically-incorporated banks in the reporting economy register their positions on an unconsolidated basis, comprising positions vis-à-vis their own affiliates in other economies (Cerutti et al. 2015). This conforms to the conventional balance-of-payments accounting standards. The BIS Locational banking statistics also has such remarkable feature as the exchange rate-adjusted series. These exchange rate-adjusted series better reflect changes in cross-border positions reported by banking offices.

Capital control measures are taken from Martin Schindler database and IMF's Annual Report on Exchange Rate Arrangements and Restrictions (AREAER). This data is also compared with Capital Control Indices from Fernández et al. (2015) database.[2] While Macroprudential Indices are based on Cerutti et al. (2015) database and supplemented by the new evidence from the IMF's AREAER database and European Central Bank Warehouse.[3][4] In our empirical analysis, we divide our macroprudential instruments into two main categories financial institution-targeted instruments and borrower-targeted instruments. Table 3 (APPENDIX) shows a detailed description of both financial institution-targeted and borrower-targeted macroprudential instruments. Financial institution-targeted instruments represent a sum of ten macroprudential instruments, while borrower-targeted instruments are a sum of two macroprudential instruments.

The main data sources are the World Economic Outlook (WEO), Bloomberg, Federal Reserve Economic Data (FRED), Federal Reserve Board (Fed) website and Datastream. A thorough process of data cleaning has been undertaken with variables winsorized at the 2.5% percentile to limit the effect of outliers.

4.2 Empirical model specification

To analyze the effect of capital controls and macroprudential policies on global liquidity in a sample of 112 countries, the following panel regression with country fixed effects and clustered standard errors at the country level is offered:

[2] Fernández et al. (2015) "Capital Control Measures: A New Dataset". Available at: http://www.nber.org/data-appendix/w20970/

[3] Cerutti et al. (2015) "The Use and Effectiveness of Macroprudential Policies: New Evidence". Available at: https://www.imf.org/en/Publications/WP/Issues/2016/12/31/The-Use-and-Effectiveness-of-Macroprudential-Policies-New-Evidence-42791

[4] European Central Bank Warehouse macroprudential database. Available at: https://sdw.ecb.europa.eu/browse.do?node=9689335

$$\Delta BankClaims_{j,t} = \beta_0 + \beta_1 Stockratio_t + \beta_2 LnVIX_t + \beta_3 \Delta Inflation_{j,t} +$$
$$\beta_4 LnGDPdeflator_{j,t} + \beta_5 \Delta Govdebt_{j,t} + \beta_6 \Delta Govexp_{j,t} + \beta_7 LnGovrevenue_{j,t} +$$
$$\beta_8 \Delta M2(US)_t + \beta_8 \Delta Current\ account_{jt-1} + \beta_9 CapControlIndex/MPPs_{j,t} + \gamma_j + \varepsilon_{j,t}$$

Dependent variable:

BankClaims – per cent change in cross-border claims on banks (exchange rate adjusted), BIS Locational Statistics, Table A6. Per cent Change (%ΔX) in Claims on banks is calculated by using the formula (Xafter - Xbefore)/Xbefore.

Explanatory variables:

β – estimated coefficient; *Stockratio* – stock markets turnover ratio (value traded/capitalization); *VIX* – the CBOE Volatility Index; *Inflation* – annual percentage change of the CPI, end of period; *GDP deflator* – the gross domestic product, deflator (index) is derived by dividing current price GDP by constant price GDP;[5] *General government net debt* – net debt is calculated as gross debt minus financial assets corresponding to debt instruments. These financial assets are: monetary gold and SDRs, currency and deposits, debt securities, loans, insurance, pension, and standardized guarantee schemes, and other accounts receivable; *General government total expenditure* – total expenditure consists of total expense and the net acquisition of nonfinancial assets; *General government revenue* – revenue consists of taxes, social contributions, grants receivable, and other revenue. Revenue increases government's net worth, which is the difference between its assets and liabilities; *Current account* – represents current account balance in per cent of GDP and include all transactions other than those in financial and capital items; *M2(US)* – per cent change in the US Money Supply M2; *CapControlIndex/MPPs* is either – Overall capital account restrictions index, Outflow restrictions index and Inflow restrictions index, and/or Macroprudential index; γ_j – are country fixed effects and ε_{jt} – error term.

The choice of variables in the model is suggested by previous theoretical and empirical research on the use and effectiveness of capital controls and macroprudential policies (Bruno et al. 2015; Cerutti et al. 2014, 2015). In our empirical model, depending on the data properties we either calculate percentage change or take a logarithmic transformation of variables.[6] A logarithmic transformation of variables (Ln) this is the way of normalising our data as this can help to interpret our numbers and especially it is easier to intuitively understand the per cent change or elasticity as opposed to having some variables in level and log. While the use of lagged variables in "pull" factors and country fixed effects should mitigate the potential issues of endogeneity. In addition, the Levin–Lin–Chu (2002) unit root test (xtunitroot) or stationarity test in panel

[5] The basket of goods reflected by the GDP deflator, which is a unit of GDP, is different from the typical basket of goods consumed by households (which is predominated by the C element of GDP). The GDP deflator should be employed to deflate nominal GDP to get real GDP. It is not a measure of household inflation, nor is it assigned to be, and employing to measure the rate of inflation rate experienced by households is not right.

[6] see Introductory Econometrics: A Modern Approach by Wooldridge for discussion and derivation.

datasets confirms that there is no unit root in our data series as they have been calculated or taken a logarithmic transformation.

A panel regression analysis is complemented by using the Generalized Method of Moments (GMM) estimation to ensure that the potential issue of endogeneity does not undermine our main inferences. We employ a one-step robust system GMM estimation, a method offered by Arellano and Bover (1995) and Blundell and Bond (1998). Robust option points out that the robust estimator of the covariance matrix of the parameters will be estimated (Arellano and Bover 1995). This robust estimator makes standard errors of the parameter estimates consistent if heteroscedasticity and panel-specific autocorrelation are present in one-step estimation.

5. Empirical results

Many developing and emerging countries encounter a wide range of policy challenges when they employ traditional macroeconomic instruments to deal with large and volatile capital flows. For instance, the appreciation of the exchange rate lowers the competitiveness of countries, while reducing interest rates might be inflationary and lead to overheating. A tighter fiscal policy can have an adverse impact on economic growth and its implementation can encounter political hurdles. Additionally, an accumulation of international reserves and buffers can be costly and not all countries can afford this (Rodrik 2006, Cruz and Walters 2008).

To address these policy challenges capital controls have been widely used as a policy instrument across different countries. One disadvantage of these measures is that they distinguish between residents and nonresidents and may create a distortion of incentives. As a result, nations started to embrace macroprudential policies as they can be applied to the banking or financial system as a whole and do not discriminate between residents and nonresidents.

Our main contribution is in identifying that macroprudential instruments are effective measures in reducing the volume of cross-border banking flows in a sample of 112 countries over 2000—2016. The estimation results reported in Table 5 show that the Macroprudential Index (MPI) has the expected negative sign on cross-border banking flows and is statistically significant at 1%. This index represents a sum of twelve individual indices and highlights the importance of macroprudential regulations. Although not all macroprudential instruments are effective measures if the objective is to reduce the volume of cross-border banking flows.

We divide our macroprudential instruments into two main types financial institution-targeted instruments and borrower-targeted instruments. We contribute to the literature by emphasising the importance of macroprudential policies aimed at financial institutions' assets or liabilities. The financial institution-targeted instruments index represents a sum of ten individual macroprudential instruments. The empirical results from Table 5 show that financial institution-targeted instruments index has the expected negative sign and is statistically significant at 1%. Moving from the median to the 75th percentile of financial institution-targeted instruments index decreases bank flows by, on average, about 7% to 11%, respectively. However, we can not

directly compare the economic significance of this index as its construction is quite different from the construction of other macroprudential indices in our sample.

In contrast, borrower-targeted instruments index is insignificant regulatory measure and can not be used to reduce the volume of cross-border banking flows. This index represents a sum of two individual macroprudential instruments, namely the Loan-to-Value Ratio Caps (LTV_CAP) and Debt-to-Income Ratio (DTI). Claessens (2014) argue that financial institution-targeted instruments are more important than borrower-targeted instruments when most funding flows go from a more regulated financial system. These empirical results are consistent with Basel III regulations (start 2010-2013; end 2019) imposed on the banking sector in an international dimension. Overall, financial institution-targeted instruments should prevail over borrower-targeted instruments if nations have the objective to reduce the volume of cross-border capital flows. This means that policy prioritisation would help to avoid too much discretion, and too little transparency and accountability in the financial systems of different countries.

We contribute to the literature by showing that FX and/or countercyclical reserve and general countercyclical capital buffer requirements, reserve requirement ratios and concentration limits are the most effective macroprudential policies in reducing the volume of cross-border banking flows. Importantly, FX and/or countercyclical reserve (RR_REV) and general countercyclical capital buffer requirements (CTC) measures are strongly related with lower cross-border banking flows: these indices have the expected negative sign on flows and are statistically significant at 1%. Table 6 shows that moving from the 25th to the 75th percentile on RR_REV and CTC Indices can reduce cross-border banking flows by about 12% to 36.5%, respectively. These macroprudential instruments show moderate usage across different countries with RR_REV having about 26% and CTC having 14% in a sample of 112 countries (Table 4). The statistical data shows that FX and/or countercyclical reserve and countercyclical capital buffer requirements are usually employed more in emerging and developing countries.

In terms of reserve requirement ratios, then these macroprudential regulations are also associated with a large decline in capital flows. The estimated elasticity for reserve requirement ratios implies that a 10% higher RR Index will decrease cross-border banking flows by 3.3%. Moving from the 25th to the 75th percentile on the RR Index reduces cross-border banking flows by about 8.2% to 25%, respectively.

This is followed by the significance of concentration limits (CONC) measures in reducing potentially disruptive cross-border banking flows. For example, moving from the 25th to the 75th percentile on the CONC Index is associated with a reduction in flows by about 8.14% to 24.43%, respectively (Table 6). Notably, concentration limits are the most widespread macroprudential instruments in the world with about 80% of countries using them over 2000—2016 (Table 4). This suggests the importance of reducing the level of concentration in the banking industry to prevent and mitigate future crises.

Among other macroprudential policies that impact on the volume of the cross-border bank, flows are capital surcharges on SIFIs, limits on interbank exposures (INTER) and limits on foreign currency loans (FC). Table 7 shows that moving from the median to the 75th percentile of INTER and FC Indices can reduce bank flows

by about 12% to 18%, respectively. These macroprudential instruments have the expected negative sign on cross-border banking flows and are statistically significant at 5%. This indicates a second policy priority in the implementation of these macroprudential regulations at times of large and volatile capital flows. In terms of use, then both limits on interbank exposures and limits on foreign currency loans have moderate use across countries with about 32% and 20%, respectively (Table 4). Interestingly, limits on interbank exposures are usually more used in the advanced and emerging countries while limits on foreign currency loans are more used in developing and emerging countries.

Nowadays, significant progress is being made to eliminate the systemic risks posed by systemically important financial institutions SIFIs by using macroprudential instruments. Table 7 shows that moving from the 25th to the 75th percentile on SIFIs Index is associated with a reduction in flows by about 5.4% to 16.3%, respectively. Capital surcharges on SIFIs have become popular measures only recently and previously did not have any impact on total capital flows as they have been employed only in a limited number of countries, primarily developing and emerging economies. Overall, about 11% of countries now are in use of capital surcharges on SIFIs and by far this is the smallest percentile compared to the other instruments (Table 4). We would expect that the effectiveness of capital surcharges on SIFIs would raise even further by the deadline of Basel III regulations in 2019.

We also provide empirical evidence that leverage ratios, limits on lending in domestic currency and levy/tax on financial institutions appear to be insignificant regulatory measures (Table 8). Cerutti et al. (2015) argue that the implementation and effectiveness of different macroprudential instruments go together and they are connected with each other. The inability of some macroprudential instruments to reduce the volume of cross-border banking flows can be also connected with their low use across countries. For instance, leverage ratios (LEV) and levy/tax on financial institutions (TAX) make up from about 17% to 15%, respectively (Table 4). These measures are used in both advanced and emerging countries, however, the fraction of these macroprudential instruments is still relatively low. This adversely affects the effectiveness of these regulatory measures in reducing countries' exposures to variations in global liquidity.

The small percentile of leverage ratios (LEV) and levy/tax on financial institutions (TAX) in Table 4 is consistent and reflects different stages of Basel III regulations. One of the important features of Basel III regulations is imposing mandatory leverage ratios (capital to assets) to lower leverage in the financial institutions. The leverage ratios have become a mandatory part of Basel III requirements only in 2018. Similarly, limits on lending in domestic currency (CG) are used in about 14% of countries with primarily emerging and developing countries in a sample.

As the final part of the research, we are aimed to contribute by examining the joint impact of capital controls and macroprudential instruments on cross-border banking flows. Tables 10 and 11 show the impact of both equity outflow restrictions index and countercyclical capital buffer requirements (CTC) in reducing the volume of cross-border banking flows. These indices have the expected negative sign and are statistically and economically significant regulatory measures across different countries. This suggests that capital controls can

complement and should be used alongside instead of replacing corresponding macroprudential policies. Similarly, bond inflow restrictions index, collective investments outflow restrictions index and countercyclical capital buffer requirements can reinforce each other and reduce large and volatile cross-border banking flows even further. We also look at the joint impact of equity and collective investments outflow restrictions index, bond inflow restrictions index and concentration limits (CONC) on cross-border banking flows. Our empirical results show that these capital controls and macroprudential instruments can be used together, and in a majority of cases, reinforce each other.

Table 9 serves as a robustness check for that the Macroprudential Index (MPI) when we include additional control variables. Additionally, the system dynamic panel GMM estimation and maximum likelihood (MLE) estimation from Table 5 (columns 2 and 4) and Table 7 (columns 2, 4 and 6) largely confirm the economic and statistical significance of macroprudential instruments and capital controls included in the panel data analysis with country fixed effects, although there might be some small differences. In particular, the system dynamic panel GMM highlights the short-lived effect of macroprudential instruments and capital controls and suggests that they should be maintained and tuned all the time.

6. Conclusion and policy suggestions

This paper analyses the usage of capital controls and macroprudential policies aimed at mitigating system-wide/systemic financial crises across different countries around the world. In general, cross-country analysis can be helpful in clarifying that capital controls and macroprudential instruments are effective measures in reducing the volume of cross-border banking flows.

The large and volatile cross-border banking flows account for a substantial fraction of total capital flows and are inclined to have a procyclical nature which threatens financial stability in different countries (Milesi-Feretti and Tille 2011, Brunnermeier et al. 2012, Bruno and Shin 2013, 2015). Capital flow regulations coupled with global monetary policy coordination can lower financial stability risks sufficiently to allow nations to reap the benefits of capital flows (Brunnermeier et al. 2012). However, in practice, political decisions may impede implementation of multilateral regulations of the banking sector, while monetary policy is inclined to be more domestically oriented rather than carry global perspectives in mind.

Our main contribution is in identifying that capital controls and macroprudential policies are effective measures in reducing the volume of cross-border banking flows. Importantly, countries should embrace macroprudential policies as a matter of first priority given that they can help to optimally manage capital flows without discriminating foreigners. This is consistent with Basel III regulations and highlights their effectiveness in raising the resilience of the banking sector in an international dimension. The empirical results shed light on the fact that financial institution-targeted prevail over borrower-targeted macroprudential instruments in reducing the volume of cross-border banking flows. For instance, FX and/or countercyclical reserve requirements (RR_REV), reserve requirements ratios (RR) and limits on foreign currency loans (FC)

are useful regulatory measures in reducing system-wide vulnerabilities. We find that financial institution-targeted instruments are employed more often in emerging and developing countries, with especially foreign exchange related instruments (RR_REV and FC) have been more widespread. While borrower-targeted instruments (LTV_CAP and DTI) are used more in developed countries. These macroprudential instruments are more related to reduce booms and thereby busts, in real estate markets and appear to be insignificant regulatory measures in curbing capital flows (Claessens 2014, Cerutti et al. 2015). And progress is also being made to reduce the systemic risks created by large financial institutions SIFIs using, among others, macroprudential policies. Altogether, the empirical results imply that macroprudential instruments have a considerable impact on procyclicality and volume of capital flows. Countries can limit the circumvention of these policies by following Basel III regulations and adopting certain capital controls across borders.

The findings of the research have important policy implications for global policymakers who are confronting global nature of risk which threatens financial stability. We now know what capital controls and macroprudential policies are effective in reducing the volume of cross-border banking flows. Additionally, we are first to provide empirical evidence that these instruments should be used together to manage countries' exposures to fluctuations in global liquidity.

A: Descriptive Statistics and Benchmark Regression Results

Table 1 Descriptive statistics

This table summarizes the key variables grouped into global factors, financial market factors and country-specific factors. We provide their names, number of observations, mean, standard deviation, minimum and maximum. Additionally, Table provides summary of Capital Controls and Macroprudential policies.

Variable	Obs	Mean	Std. Dev.	Min	Max
Per cent Change in cross-border Claims on banks (Xafter - Xbefore)/Xbefore)	**2,533**	-0.7640348	0.688131	-1.592289	0.07
VIX CBOE (logged VIX_t)	**2,533**	21.10941	8.165958	11.04	44.68
Per cent Change in Government Expenditure (calculated by an author with the help of formula)	**2,533**	0.0097956	0.0405908	-0.0407889	0.0676812
Change in Government debt (data provided)	**2,533**	48.61016	25.45275	14.732	95.561
Log GDP Deflator	**2,533**	6.805786	0.8734698	5.02388	7.720462
Log Government revenue	**2,533**	3.304895	0.3563753	2.749448	3.813771
Change in US Money Supply M2 (y/y – data provided)	**2,533**	6.333529	1.512265	2.513	8.622
Change in Inflation (data provided)	**2,533**	4.84701	3.837008	0.325	12.184
Stock markets turnover ratio (value traded/capitalization)	**2,533**	32.86588	9.866256	12.81	53.98
Per cent Change in Current account (data provided)	**2,533**	-2.059927	6.801619	-12.309	9.97
Overall restrictions index	**1,552**	0.37	0.31	0	1
Overall outflow restrictions index	**1,552**	0.29	0.29	0	1
Direct investment outflow restrictions	**1,552**	0.17	0.32	0	1
Equity outflow restrictions index	**1,552**	0.27	0.34	0	1
Bond outflow restrictions index	**1,552**	0.32	0.35	0	1
Derivatives outflow restrictions	**1,521**	0.35	0.31	0	1

Table 1 Descriptive statistics

This table provides summary of Capital Controls and Macroprudential policies. We provide their names, number of observations, mean, standard deviation, minimum and maximum.

Variable	Obs	Mean	Std. Dev.	Min	Max
Money Market outflow restrictions index	**1,552**	0.30	0.36	0	1
Financial credits outflow restrictions	**1,552**	0.41	0.51	0	1
Commercial credits outflow restrictions	**1,552**	0.31	0.41	0	1
Collective investments outflow restrictions index	**1,552**	0.33	0.46	0	1
Overall inflow restrictions index	**1,552**	0.37	0.31	0	1
Direct investment inflow restrictions index	**1,552**	0.76	0.40	0	1
Equity inflow restrictions index	**1,552**	0.38	0.39	0	1
Bond inflow restrictions index	**1,552**	0.27	0.38	0	1
Derivatives inflow restrictions	**1,552**	0.33	0.29	0	1
Money Market inflow restrictions index	**1,552**	0.32	0.40	0	1
Financial credits inflow restrictions	**1,552**	0.25	0.38	0	1
Commercial credits inflow restrictions	**1,552**	0.30	0.39	0	1
Collective investments inflow restrictions index	**1,552**	0.31	0.38	0	1
US Financial Openness index	**1,788**	78.82353	8.999967	70	90
UK Financial Openness index	**1,788**	85.88235	4.922458	80	90

Table 1 Descriptive statistics

This table provides summary of Capital Controls and Macroprudential policies. We provide their names, number of observations, mean, standard deviation, minimum and maximum.

Variable	**Obs**	Mean	Std. Dev.	Min	Max
MPI (index 0-12)	**1,791**	1.96	1.43	0	8
FINANCIAL MPI (0-10)	**1,788**	1.56	1.33	0	7
BORROWER MPI (0-2)	**1,788**	0.28	0.59	0	2
CTC	**1,788**	0.02	0.9	0	1
RR_REV	**1,792**	0.18	0.35	0	1
RR	**1,792**	0.11	0.31	0	1
CONC	**1,792**	0.7	0.5	0	1
INTER	**1,789**	0.2	0.34	0	1
FC	**1,792**	0.1	0.29	0	1
SIFI	**1,921**	0.11	0.3	0	1
LEV	**1,788**	0.15	0.35	0	1
CG	**1,792**	0.1	0.28	0	1
TAX	**1,792**	0.12	0.31	0	1
Chinn-Ito Index	**1,739**	0.5223782	1.604578	-1.894798	2.389193
ROE (US)	**1,788**	9.715367	3.903517	1.346814	14.87085
Δ REER (US) (data calculated by an author with the help of formula)	**1,788**	-0.0019646	0.0492597	-0.072068	0.1347546

Table 2 List of Countries

This table summarizes the list of countries included in panel regression analysis with country fixed effects.

Albania	Iceland	Panama
Algeria	India	Paraguay
Angola	Indonesia	Peru
Armenia	Ireland	Philippines
Australia	Israel	Poland
Austria	Italy	Portugal
Azerbaijan	Jamaica	Qatar
Bahamas	Japan	Romania
Bangladesh	Jordan	Russia
Belarus	Kazakhstan	Rwanda
Belgium	Kenya	Saudi Arabia
Bolivia	Korea	Serbia
Brazil	Kuwait	Singapore
Bulgaria	Latvia	Slovak Republic
Burundi	Lebanon	Slovenia
Canada	Libya	South Africa
Chile	Lithuania	Spain
China	Luxembourg	Sri Lanka
Colombia	Malawi	Sweden
Costa Rica	Malaysia	Switzerland
Croatia	Maldives	Taiwan Province of China
Cyprus	Mali	Tanzania
Czech Republic	Malta	Thailand
Denmark	Mauritius	Tunisia
Dominican Republic	Mexico	Turkey
Egypt	Moldova	Turkmenistan
Estonia	Mongolia	Uganda
Ethiopia	Montenegro	Ukraine
Finland	Morocco	United Arab Emirates
France	Mozambique	***United Kingdom***
Georgia	Namibia	***United States***
Germany	Nepal	Uzbekistan
Ghana	Netherlands	Venezuela
Greece	New Zealand	Vietnam
Guatemala	Nicaragua	Zambia
Haiti	Norway	Zimbabwe
Hong Kong SAR	Oman	
Hungary	Pakistan	

Table 3 Descriptive Analysis of Macroprudential Instruments [7]

Instrument/Group	Sheet Name/ Abbrevation	Definition
Groups		
Macroprudential Index (0-12)	**MPI**	LTV_CAP + DTI + DP + CTC + LEV + SIFI + INTER + CONC + FC + RR_REV + CG + TAX
Borrower-Targeted Instruments (0-2)	**BORROWER**	LTV_CAP + DTI
Financial Institution-Targted Instruments (0-10)	**FINANCIAL**	DP + CTC + LEV + SIFI + INTER + CONC + FC + RR_REV + CG + TAX
Borrower-targeted macroprudential instruments		
Survey Instruments (0-1)		
Loan-to-Value Ratio	**LTV**	Constrains highly levered mortgage downpayments by enforcing or encouraging a limit or by determining regulatory risk weights.
Debt-to-Income Ratio	**DTI**	Imposes restrictions on households indebtedness by enforcing or stimulating limits.
Derived Instruments (0-1)		
Loan-to-Value Ratio Caps	**LTV_CAP**	Imposes restrictions to LTV used as a strictly enforced cap on new loans, in contrast with a supervisory instruction or merely a determinant of risk weights.

[7] Source: "The Use and Effectiveness of Macroprudential Policies: New Evidence" by Eugenio Cerutti, Stijn Claessens and Luc Laeven. IMF Working paper, March 2015.

Table 3 Descriptive Analysis of Macroprudential Instruments [8]

Instrument/Group	Sheet Name/ Abbrevation	Definition
Financial institution-targeted macroprudential instruments		
Survey Instruments (0-1)		
Leverage Ratio	**LEV**	Imposes limits on banks from going over a fixed minimum leverage ratio.
Capital Surcharges on SIFIs	**SIFI**	Imposes a requirement on systemically important financial institutions to have a higher capital level than other financial institutions.
Limits on Interbank Exposures	**INTER**	Imposes limits on the proportion of liabilities held by the banking sector or by individual banks.
Concentration Limits	**CONC**	Imposes limits on the proportion of assets held by a small or limited number of borrowers.
Limits on Foreign Currency Loans	**FC**	Limits aimed to reduce or mitigate exposures to foreign-currency risks.
Reserve Requirement Ratios	**RR**	Imposes limits on credit growth and can be employed to reduce foreign-currency credit growth.
Limits on Domestic Currency Loans	**CG**	Imposes limits on credit growth directly.
Levy/Tax on Financial Institutions	**TAX**	Imposes taxes on proceeds of financial institutions.
Time-Varying/Dynamic Loan-Loss Provisioning	**DP**	Imposes a requirement on banks to have more loan-loss provisions during recovery stage or upturns.
General Countercyclical Capital Buffer/Requirement	**CTC**	Imposes a requirement on banks to have more capital during recovery stage or upturns.
Derived Instruments (0-1)		
FX and/or Countercyclical Reserve Requirements	**RR_REV**	Imposes restriction to reserve requirements RR by a) having a wedge of on foreign currency deposits, or b) is meant to be adjusted countercyclically.

[8] Source: "The Use and Effectiveness of Macroprudential Policies: New Evidence" by Eugenio Cerutti, Stijn Claessens and Luc Laeven. IMF Working paper, March 2015.

Table 4 The usage of macroprudential instruments in a sample of 112 countries, over the period 2000-2016

For each subgroup of countries, the frequency of use is the ratio of country-years using a given instrument to the total number of country-years using a macroprudential policy over the sample period 2000-2016.[9]

Variables	Total Countries	Advanced	Emerging Markets	Developing
	(1)	(2)	(3)	(4)
LTV_CAP	25%	41%	20%	7%
DTI	20%	14%	21%	1%
DP	10%	6%	7%	19%
CTC	14%	5%	12%	7%
LEV	17%	14%	17%	12%
SIFI	11%	5%	7%	10%
INTER	32%	35%	33%	20%
CONC	80%	72%	79%	80%
FC	20%	12%	20%	16%
RR_REV	26%	1%	27%	36%
CG	14%	0%	12%	27%
TAX	15%	14%	15%	11%

[9] Source: "The Use and Effectiveness of Macroprudential Policies: New Evidence" by Eugenio Cerutti, Stijn Claessens and Luc Laeven. IMF Working paper, March 2015. Corresponds to the calculations of Cerutti et al. 2015 and is extended by authors calculations. Source: European Central Bank Warehouse and IMF database.

Benchmark Regression results

Table 5 Regression Results for Cross-Border Claims to Banks, for period 2000-2016

Dependent Variable: Per cent Change in cross-border claims on banks (Per cent Change in BIS Locational Cross-Border Claims on Banks, exchange rate adjusted, Table A6). Per cent Change (%ΔX) in Claims on banks is calculated by using the formula (Xafter - Xbefore)/Xbefore. MPI Macroprudential Index (0-12) represents a sum of individual Indices [LTV_CAP + DTI + DP + CTC + LEV + SIFI + INTER + CONC + FC + RR_REV + CG + TAX]. FINANCIAL Financial Institution-Targeted Instruments (0-10) represents a sum of individual instruments [DP + CTC + LEV + SIFI + INTER + CONC + FC + RR_REV + CG + TAX]. BORROWER Borrower-Targeted Instruments (0-2) represents a sum of individual instruments [LTV_CAP + DTI]. Robust standard errors are reported in parentheses and indicate significance at the 1% *** p<0.01, at the 5% ** p<0.05, and at the 10% * p<0.1, respectively.

Variables	Macroprudential Index MPI		Financial Institution-Targeted and Borrower-Targeted Instruments	
	Panel Regression	Dynamic panel GMM	Panel Regression	Dynamic panel GMM
Stockturnover	0.0014**	0.0020***	0.0014**	0.0013***
	(0.0006)	(0.0003)	(0.0006)	(0.0002)
VIX CBOE	-0.0151***	-0.0132***	-0.0149***	-0.0107***
	(0.0029)	(0.0011)	(0.0029)	(0.0008)
Δ Govexp	-0.4069	-0.1569	-0.4329	-0.4377**
	(0.4261)	(0.5260)	(0.4265)	(0.1978)
Δ GovDEBT	-0.0022*	-0.0033***	-0.0021*	-0.0012**
	(0.0012)	(0.0007)	(0.0012)	(0.0006)
Ln GDPdeflator	-0.0404**	-0.0210*	-0.0389**	-0.0250***
	(0.0195)	(0.0123)	(0.0195)	(0.0070)
Ln Govrevenue	0.0556		0.0936	
	(0.1515)		(0.1519)	
Δ M2 (US)	0.0123***	0.0102***	0.0123***	0.0095***
	(0.0041)	(0.0026)	(0.0041)	(0.0012)
Δ Inflation	-0.0118*	-0.0285***	-0.0124*	-0.0076
	(0.0068)	(0.0067)	(0.0068)	(0.0058)
L1. CURRENT ACCOUNT	-0.0011	-0.0019	-0.0019	0.0002
	(0.0046)	(0.0018)	(0.0046)	(0.0010)
L1. GOVERN. REVENUE		-0.0019		-0.0024
		(0.0023)		(0.0027)
ΔBankClaims L1. lag (2 2)		0.1113***		0.1262***
		(0.0419)		(0.0094)
MPI L1. lag (2 2)		-0.0561***		
		(0.0130)		
FINANCIAL MPI L1. lag (2 2)				-0.0318***
				(0.0070)
MPI	-0.0838***			
	(0.0229)			
FINANCIAL MPI			-0.1397***	
			(0.0310)	
BORROWER MPI			0.0331	-0.0184
			(0.0496)	(0.0133)
Constant	-0.2208	0.0063	-0.3101	-0.2009
	(0.5532)	(0.1555)	(0.5535)	(0.1425)
Country Fixed Effect	**Y**		**Y**	
AR(1) Test		**0.000**		**0.000**
AR(2) Test		**0.911**		**0.922**
Hansen Test/Sargan		**1.000**		**1.000**
Observations	**1,791**	**1,792**	**1,788**	**1,789**
R-squared	**0.0159**		**0.0125**	
Number of countries	**112**	**112**	**112**	**112**

Table 6 Regression Results for Cross-Border Claims to Banks, for period 2000-2016

Dependent Variable: Per cent Change in cross-border claims on banks (Per cent Change in BIS Locational Cross-Border Claims on Banks, exchange rate adjusted, Table A6). Per cent Change (%ΔX) in Claims on banks is calculated by using the formula (Xafter - Xbefore)/Xbefore. CTC General Countercyclical Capital Buffer/Requirement - requires banks to hold more capital during upturns. RR Reserve Requirement Ratios - limits credit growth; can also be targeted to limit foreign-currency credit growth. RR_REV FX and/or Countercyclical Reserve Requirements - restricts to RR which i) imposes a wedge of on foreign currency deposits, or ii) is adjusted countercyclically. CONC Concentration Limits - limits the fraction of assets held by a limited number of borrowers. Robust standard errors are reported in parentheses and indicate significance at the 1% *** p<0.01, at the 5% ** p<0.05, and at the 10% * p<0.1, respectively.

Variables	General Countercyclical Capital Buffer/Requirement		FX and/or Countercyclical RR	Reserve Requirement Ratios		Concentration Limits
	Panel Regression	Dynamic panel GMM	Panel Regression	Panel Regression	Dynamic panel GMM	Panel Regression
Stockturnover	0.0016**	0.0012***	0.0016**	0.0015**	0.0014***	0.0017**
	(0.00068)	(0.0002)	(0.0006)	(0.0006)	(0.0001)	(0.00068)
VIX CBOE	-0.0137***	-0.0102***	-0.0141***	-0.0140***	-0.0108***	-0.0140***
	(0.0029)	(0.0007)	(0.0029)	(0.0029)	(0.0007)	(0.0029)
Δ Govexp	-0.3332	-0.3281*	-0.4318	-0.4247	-0.3562**	-0.4403
	(0.4256)	(0.1748)	(0.4247)	(0.4250)	(0.1599)	(0.4249)
Δ GovDEBT	-0.0018	-0.0003	-0.0019	-0.0022*	-0.0001	-0.0019
	(0.0012)	(0.0005)	(0.0012)	(0.0012)	(0.0006)	(0.0012)
Ln GDPdeflator	-0.0253	-0.0118	-0.0239	-0.0252	0.0030	-0.0230
	(0.0188)	(0.0077)	(0.0188)	(0.0188)	(0.0055)	(0.0188)
Ln Govrevenue	0.0001		0.0586	0.0239		0.0168
	(0.1512)		(0.1519)	(0.1513)		(0.1512)
Δ M2 (US)	0.0121***	0.0083***	0.0124***	0.0123***	0.0091***	0.0121***
	(0.0041)	(0.0013)	(0.0041)	(0.0041)	(0.0011)	(0.0041)
Δ Inflation	-0.0082	-0.0025	-0.0105	-0.0109*	-0.0016	-0.0115*
	(0.0069)	(0.0047)	(0.0068)	(0.0068)	(0.0036)	(0.0068)
L1. CURRENT ACCOUNT	-0.0016	0.0010	-0.0014	-0.0014	0.0005	-0.0014
	(0.0045)	(0.0011)	(0.0045)	(0.0045)	(0.0012)	(0.0045)
L1. GOVERN. REVENUE		0.0015			0.0001	
		(0.0020)			(0.0023)	
ΔBankClaims L1. (2 2)		0.1192***			0.1210***	
		(0.0080)			(0.0074)	
CTC L1. lag (2 2)		-0.1114*				
		(0.0594)				
RR L1. lag (2 2)					-0.0436**	
					(0.0172)	
CTC	-0.4537***					
	(0.1669)					
RR_REV			-0.4865***			
			(0.1543)			
RR				-0.3376***		
				(0.1188)		
CONC						-0.3257***
						(0.1111)
Constant	-0.3620	-0.5624***	-0.4759	-0.3088	-0.5955***	-0.2282
	(0.5525)	(0.1047)	(0.5513)	(0.5536)	(0.1060)	(0.5563)
Country Fixed Effect	**Y**		**Y**	**Y**		**Y**
AR(1) Test		**0.000**			**0.000**	
AR(2) Test		**0.976**			**0.999**	
Hansen Test/Sargan		**1.000**			**1.000**	
Observations	**1,788**	**1,790**	**1,792**	**1,792**	**1,792**	**1,792**
R-squared	**0.0197**		**0.0101**	**0.0120**		**0.0133**
Number of countries	**112**	**112**	**112**	**112**	**112**	**112**

Table 7 Regression Results for Cross-Border Claims to Banks, for period 2000-2016

Dependent Variable: Per cent Change in cross-border claims on banks (Per cent Change in BIS Locational Cross-Border Claims on Banks, exchange rate adjusted, Table A6). Per cent Change (%ΔX) in Claims on banks is calculated by using the formula (Xafter - Xbefore)/Xbefore. INTER Limits on Interbank Exposures - limits the fraction of liabilities held by the banking sector or by individual banks. FC Limits on Foreign Currency Loans - reduces vulnerability to foreign-currency risks. SIFI Capital Surcharges on SIFIs - requires Systemically Important Financial Institutions to hold a higher capital level than other financial institutions. Robust standard errors are reported in parentheses and indicate significance at the 1%*** p<0.01, at the 5% ** p<0.05, and at the 10% * p<0.1, respectively.

Variables	Limits on Interbank Exposures		Limits on Foreign Currency Loans		Capital Surcharges on SIFIs	
	Panel Regression	Dynamic panel GMM	Panel Regression	Dynamic panel GMM	Panel Regression	Maximum Likelihood
Stockturnover	0.0016**	0.0014***	0.0016**	0.0012***	0.0017***	0.0019***
	(0.0006)	(0.0001)	(0.0007)	(0.0001)	(0.0006)	(0.0006)
VIX CBOE	-0.0143***	-0.0101***	-0.0141***	-0.0100***	-0.0141***	-0.0132***
	(0.0029)	(0.0007)	(0.0029)	(0.0008)	(0.0029)	(0.0027)
Δ Govexp	-0.3975	-0.3864	-0.4157	-0.4704	-0.4067	-0.3615
	(0.4254)	(0.2392)	(0.4252)	(0.2914)	(0.4112)	(0.4009)
Δ GovDEBT	-0.0016	-0.0003	-0.0015	-0.0005	-0.0016	-0.0005
	(0.0012)	(0.0006)	(0.0012)	(0.0006)	(0.0012)	(0.0007)
Ln GDPdeflator	-0.0278	-0.0115*	-0.0284	-0.0143*	-0.0314*	-0.0298*
	(0.0190)	(0.0062)	(0.0190)	(0.0078)	(0.0182)	(0.0175)
Ln Govrevenue	0.0032		0.0307		0.0153	0.0617
	(0.1518)		(0.1516)		(0.1493)	(0.0524)
Δ M2 (US)	0.0127***	0.0081***	0.0126***	0.0080***	0.0109***	0.0111***
	(0.0041)	(0.0010)	(0.0041)	(0.0012)	(0.0040)	(0.0039)
Δ Inflation	-0.0105	-0.0008	-0.0114*	-0.0009	-0.0096	-0.0148*
	(0.0068)	(0.0056)	(0.0069)	(0.0051)	(0.0067)	(0.0077)
L1. CURRENT ACCOUNT	-0.0018	0.0002	-0.0015	0.0006	-0.0004	-0.0001
	(0.0045)	(0.0010)	(0.0045)	(0.0011)	(0.0044)	(0.0027)
L1. GOVERN. REVENUE		0.0046*		0.0037		
		(0.0024)		(0.0025)		
ΔBankClaims L1. lag (2 2)		0.1262***		0.1245***		
		(0.0092)		(0.0085)		
INTER L1. lag (2 2)		-0.0394**				
		(0.0166)				
FC L1. lag (2 2)				-0.0709***		
				(0.0156)		
INTER	-0.2316**					
	(0.1034)					
FC			-0.2383**			
			(0.1026)			
SIFI					-0.2169**	-0.1665**
					(0.0907)	(0.0841)
Constant	-0.3059	-0.6688***	-0.4216	-0.6265***	-0.3827	-0.5949***
	(0.5567)	(0.1111)	(0.5520)	(0.1042)	(0.5407)	(0.2242)
Country Fixed Effect	**Y**		**Y**		**Y**	
AR(1) Test		**0.000**		**0.000**		
AR(2) Test		**0.998**		**0.992**		
Hansen Test/Sargan		**1.000**		**1.000**		
Observations	**1,789**	**1,790**	**1,792**	**1,792**	**1,920**	**1,920**
R-squared	**0.0125**		**0.0113**		**0.0181**	
Number of countries	**112**	**112**	**112**	**112**	**120**	**120**

Table 8 Regression Results for Cross-Border Claims to Banks, for period 2000-2016

Dependent Variable: Per cent Change in cross-border claims on banks (Per cent Change in BIS Locational Cross-Border Claims on Banks, exchange rate adjusted, Table A6). Per cent Change (%ΔX) in Claims on banks is calculated by using the formula (Xafter - Xbefore)/Xbefore. LEV Leverage Ratio - limits banks from exceeding a fixed minimum leverage ratio. CG Limits on Domestic Currency Loans - limits credit growth directly. TAX Levy/Tax on Financial Institutions - taxes revenues of financial institutions. Robust standard errors are reported in parentheses and indicate significance at the 1%*** p<0.01, at the 5% ** p<0.05, and at the 10% * p<0.1, respectively.

Variables	Leverage Ratio	Limits on Domestic Currency Loans	Levy/Tax on Financial Institutions
	Panel Regression	Panel Regression	Panel Regression
Stockturnover	0.0017***	0.0011*	0.0011*
	(0.0006)	(0.0006)	(0.0006)
VIX CBOE	-0.0139***	-0.0110***	-0.0113***
	(0.0029)	(0.0023)	(0.0023)
Δ Govexp	-0.3609	-0.3489	-0.3793
	(0.4265)	(0.4255)	(0.4266)
Δ GovDEBT	-0.0015	-0.0019	-0.0021*
	(0.0012)	(0.0012)	(0.0012)
Ln GDPdeflator	-0.0206*	-0.0520***	-0.0520***
	(0.0189)	(0.0199)	(0.0199)
Ln Govrevenue	0.0011	0.1852	0.1904
	(0.1529)	(0.1558)	(0.1556)
Δ M2 (US)	0.0125***	0.0089**	0.0088**
	(0.0041)	(0.0039)	(0.0039)
Δ Inflation	-0.0097*	-0.0036***	-0.0038***
	(0.0068)	(0.0008)	(0.0009)
L1. CURRENT ACCOUNT	-0.0013	-0.003	-0.0018
	(0.0045)	(0.0045)	(0.0046)
LEV	0.0394		
	(0.1188)		
CG		-0.1381	
		(0.1550)	
TAX			-0.0325
			(0.1023)
Constant	-0.4231	-0.0701	-0.0272
	(0.5547)	(0.5593)	(0.5642)
Country Fixed Effect	**Y**	**Y**	**Y**
Observations	**1,788**	**1,792**	**1,792**
R-squared	**0.0143**	**0.0196**	**0.0229**
Number of countries	**112**	**112**	**112**

Table 9 Panel Regression Results for Cross-Border Claims to Banks, for period 2000-2016

Dependent Variable: Per cent Change in cross-border claims on banks (Per cent Change in BIS Locational Cross-Border Claims on Banks, exchange rate adjusted, Table A6). Per cent Change (%ΔX) in Claims on banks is calculated by using the formula (Xafter - Xbefore)/Xbefore. FINANCIAL Financial Institution-Targeted Instruments (0-10) represents a sum of individual instruments [DP + CTC + LEV + SIFI + INTER + CONC + FC + RR_REV + CG + TAX]. Chinn-Ito Index - is an Index measuring a country's degree of capital account openness over 2000-2014. US, UK Financial freedom Index - financial freedom is a measure of banking security as well as a measure of independence from government control. Δ REER (US) – per cent change in Real Effective Exchange Rates. ROE (US) - Return On Equity. Robust standard errors are reported in parentheses and indicate significance at the 1% *** p<0.01, at the 5% ** p<0.05, and at the 10% * p<0.1, respectively.

Variables	(1)	(2)	(3)	(4)	(5)
Stockturnover	0.0013*	0.0016*	0.0001	0.0011*	0.0029***
	(0.0007)	(0.0009)	(0.0007)	(0.0006)	(0.0008)
VIX CBOE	-0.0144***	-0.0156***	-0.0167***	-0.0146***	-0.0104***
	(0.0029)	(0.0029)	(0.0029)	(0.0029)	(0.0031)
Δ Govexp	-0.3937	-0.3850	-0.4889	-0.4027	-0.3305
	(0.4338)	(0.4226)	(0.4252)	(0.4258)	(0.4226)
Δ GovDEBT	-0.0021*	-0.0021*	-0.0024*	-0.0023*	-0.0026**
	(0.0012)	(0.0012)	(0.0012)	(0.0012)	(0.0012)
Ln GDPdeflator	-0.0430**	-0.0624***	-0.0606***	-0.0438**	-0.0616***
	(0.0198)	(0.0202)	(0.0201)	(0.0193)	(0.0200)
Ln Govrevenue	0.0818	0.2009	0.1687	0.1194	0.2084
	(0.1571)	(0.1547)	(0.1532)	(0.1526)	(0.1547)
Δ M2 (US)	0.0119***	0.0129***	0.0114***	0.0111***	0.0141***
	(0.0041)	(0.0041)	(0.0041)	(0.0041)	(0.0041)
Δ Inflation	-0.0135*	-0.0142**	-0.0150**	-0.0138**	-0.0121*
	(0.0070)	(0.0068)	(0.0069)	(0.0069)	(0.0068)
L1. CURRENT ACCOUNT	-0.0035	-0.0041	-0.0027	-0.0023	-0.0039
	(0.0045)	(0.0050)	(0.0046)	(0.0046)	(0.0045)
FINANCIAL MPI	-0.1200***	-0.0845***	-0.0932***	-0.1252***	-0.0940***
	(0.0307)	(0.0326)	(0.0323)	(0.0303)	(0.0314)
Chinn-Ito Index	0.0247			-0.0184	-0.0184
	(0.0332)			(0.0133)	(0.0133)
US Financial Openness Index		0.0080***			
		(0.0023)			
UK Financial Openness Index			0.0152***		
			(0.0045)		
Δ REER (UK)				-0.0066*	
				(0.0037)	
ROE (US)					0.0214***
					(0.0058)
Constant	-0.2869	-1.1805*	-1.6416**	-0.2768	-0.9797*
	(0.5704)	(0.6044)	(0.6871)	(0.5501)	(0.5793)
Country Fixed Effect	**Y**	**Y**	**Y**	**Y**	**Y**
Observations	**1,739**	**1,788**	**1,788**	**1,788**	**1,788**
R-squared	**0.0119**	**0.0223**	**0.0209**	**0.0148**	**0.0214**
Number of countries	**109**	**112**	**112**	**112**	**112**

Table 10 Regression Results for Cross-Border Claims to Banks, for period 2000-2016

Dependent Variable: Per cent Change in cross-border claims on banks (Per cent Change in BIS Locational Cross-Border Claims on Banks, exchange rate adjusted, Table A6). Per cent Change (%ΔX) in Claims on banks is calculated by using the formula (Xafter - Xbefore)/Xbefore. SCHINDLER (2009) and IMF database on capital controls and Macroprudential Indices: Equity outflow restrictions index, Bond inflow restrictions index, Collective investments outflow restrictions, CTC and CONC. Robust standard errors are reported in parentheses and indicate significance at the 1% *** p<0.01, at the 5% ** p<0.05, and at the 10% * p<0.1, respectively.

Variables	Equity outflow restrictions and CTC	Bond inflow restrictions and CTC	Collective invest. outflow index and CTC
	Panel Regression	Panel Regression	Panel Regression
Stockturnover	0.0023***	0.0023***	0.0022***
	(0.0008)	(0.0008)	(0.0008)
VIX CBOE	-0.0157***	-0.0158***	-0.0162***
	(0.0035)	(0.0034)	(0.0035)
Δ Govexp	-0.4270	-0.3941	-0.3692
	(0.5374)	(0.5375)	(0.5374)
Δ GovDEBT	-0.0012	-0.0018	-0.0015
	(0.0016)	(0.0016)	(0.0016)
Ln GDPdeflator	-0.0063	-0.0017	-0.0064
	(0.0226)	(0.0226)	(0.0227)
Ln Govrevenue	0.1223	0.1054	0.0724
	(0.1785)	(0.1784)	(0.1770)
Δ M2 (US)	0.0127**	0.0126**	0.0128***
	(0.0050)	(0.0049)	(0.0049)
Δ Inflation	-0.0169*	-0.0159*	-0.0152*
	(0.0089)	(0.0089)	(0.0089)
L1. CURRENT ACCOUNT	-0.0046	-0.0049	-0.0047
	(0.0061)	(0.0061)	(0.0061)
Equity outflow restrictions index	-0.1885**		
	(0.0843)		
CTC	-0.4760**	-0.5311**	-0.4967**
	(0.2059)	(0.2047)	(0.2054)
Bond inflow restrictions index		-0.1733*	
		(0.1016)	
Collective investments outflow restrictions			-0.0952*
			(0.0510)
Constant	-0.5925	-0.5773	-0.5172
	(0.6470)	(0.6500)	(0.6534)
Country Fixed Effect	**Y**	**Y**	**Y**
Observations	**1,244**	**1,244**	**1,244**
R-squared	**0.0285**	**0.0260**	**0.0265**
Number of countries	**78**	**78**	**78**

Table 11 Regression Results for Cross-Border Claims to Banks, for period 2000-2016

Dependent Variable: Per cent Change in cross-border claims on banks (Per cent Change in BIS Locational Cross-Border Claims on Banks, exchange rate adjusted, Table A6). Per cent Change (%ΔX) in Claims on banks is calculated by using the formula (Xafter - Xbefore)/Xbefore. SCHINDLER (2009) and IMF database on capital controls and Macroprudential Indices: Equity outflow restrictions index, Bond inflow restrictions index, Collective investments outflow restrictions, CTC and CONC. Robust standard errors are reported in parentheses and indicate significance at the 1% *** p<0.01, at the 5% ** p<0.05, and at the 10% * p<0.1, respectively.

Variables	Equity outflow restrictions and CONC	Bond inflow restrictions and CONC	Collective invest. outflow index and CONC
	Panel Regression	Panel Regression	Panel Regression
Stockturnover	0.0025***	0.0024***	0.0024***
	(0.0008)	(0.0008)	(0.0008)
VIX CBOE	-0.0158***	-0.0159***	-0.0163***
	(0.0034)	(0.0035)	(0.0035)
Δ Govexp	-0.5326	-0.4995	-0.4734
	(0.5364)	(0.5368)	(0.5367)
Δ GovDEBT	-0.0014	-0.0020	-0.0017
	(0.0016)	(0.0016)	(0.0016)
Ln GDPdeflator	-0.0076	-0.0025	-0.0074
	(0.0227)	(0.0226)	(0.0227)
Ln Govrevenue	0.1254	0.1045	0.0708
	(0.1787)	(0.1786)	(0.1773)
Δ M2 (US)	0.0128***	0.0127**	0.0129***
	(0.0049)	(0.00493)	(0.0049)
Δ Inflation	-0.0196**	-0.0187**	-0.0178**
	(0.0089)	(0.0089)	(0.0089)
L1. CURRENT ACCOUNT	-0.0040	-0.0043	-0.0041
	(0.0061)	(0.0061)	(0.0061)
Equity outflow restrictions index	-0.2068**		
	(0.0837)		
Bond inflow restrictions index		-0.1818*	
		(0.1018)	
Collective investments outflow restrictions			-0.0973*
			(0.0508)
CONC	-0.2876*	-0.3009*	-0.2814*
	(0.1564)	(0.1568)	(0.1566)
Constant	-0.3851	-0.3683	-0.3254
	(0.6614)	(0.6653)	(0.6675)
Country Fixed Effect	**Y**	**Y**	**Y**
Observations	**1,248**	**1,248**	**1,248**
R-squared	**0.0185**	**0.0166**	**0.0164**
Number of countries	**78**	**78**	**78**

References

Abiad, A., Leigh, D., and Mody, A., (2009). Financial integration, capital mobility, and income convergence. Economic Policy, vol. 24, No. 4, 241–305.

Ahmed, S., and Zlate, A., (2013). Capital flows to emerging market economies: a brave new world? International Finance Discussion Papers 1081, Washington, D.C.: Board of Governors of the Federal Reserve System, 1–46.

Akerlof, G., A., Blanchard, O. J., Romer, D., and Stiglitz, J.E., (2014). What Have We Learned? Macroeconomic Policy after the Crisis. MIT Press, 1–368.

Ang, A., and Bekaert, G., (2002). International asset allocation with regime shifts. Review of Financial Studies, vol. 15, 1137–1187.

Arellano, M., and Bover, O., (1995). Another look at the instrumental variable estimation of error-components models. Journal of Econometrics, vol. 68, 29–52.

Baba, C., and Kokenyne, A., (2011). Effectiveness of Capital Controls in Selected Emerging Markets in the 2000s. IMF Working Paper, WP/11/281, 1–44.

Beirne, J., and Friedrich, C., (2014). Capital flows and macro-prudential policies: A multilateral assessment of effectiveness and externalities. Working Paper Series, No. 1721, ECB, Frankfurt.

Beirne, J., and Friedrich, C., (2017). Macroprudential policies, capital flows, and the structure of the banking sector. Journal of International Money and Finance, vol. 75(C), 47–68.

Binici, M., Hutchison, M., and Schindler, M., (2010). Controlling capital? Legal restrictions and the asset composition of international financial flows. Journal of International Money and Finance, vol. 29, 666–684.

Blundell, R., and Bond, S., (1998). Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics, vol. 87, 115–143.

Borio, C., and Crockett, A., (2000). In search of anchors for financial and monetary stability. Greek Economic Review, vol. 20(2), 1–14.

Borio, C., and Shim, I., (2007). What can (macro)-prudential policy do to support monetary policy? in Bank of Thailand (ed) Inflation targeting in emerging market countries, Bank of Thailand, 13–14 November 2006. BIS Working Papers, 1–38.

Bretton Woods Final Act (1944). International economic problems. Section VII, 1–1135. https://fraser.stlouisfed.org/scribd/?item_id=7570&filepath=/docs/publications/books/1948_state_bwood_v1.pdf&start_page=950

Brunnermeier, M.K., (2009). Deciphering the liquidity and credit crunch 2007–08. Journal of Economic Perspectives, vol. 23(1), 77–100.

Brunnermeier, M.K., De Gregorio, J., Lane, P.R., Rey, H., and Shin, H.S., (2012). Banks and cross-border capital flows. Policy challenges and regulatory responses. VoxEU.org.

Bruno, V., Shim, I., and Shin, H.S., (2015). Comparative assessment of macroprudential policies. Bank for International Settlements BIS Working Papers, No. 502, 1–53.

Bruno, V., and Shin, H.S., (2013). Capital flows and the risk-taking chanel of monetary policy, cross-border banking and global liquidity. National Bureau of Economic Research, No. w18942.

Bruno, V., and Shin, H.S., (2014). Assessing macroprudential policies: Case of South Korea. Scandinavian Journal of Economics, vol. 116(1), 128–157.

Calvo, G.A., Leiderman, L., and Reinhart, C.M., (1994). The capital inflows problem: Concepts and issues. Contemporary Economic Policy, XII, July 1994.

Cerutti, E., Claessens, S., and Laeven, L., (2015). The use and effectiveness of macroprudential policies: New evidence. IMF Working Paper, WP/15/61, 1–42.

Cerutti, E., Claessens, S., and Laeven, L., (2016). The use and effectiveness of macroprudential policies: New evidence. Journal of Financial Stability (also IMF WP 15/61).

Cerutti, E., Claessens, S., and Puy, D., (2015). Push factors and capital flows to emerging markets: Why knowing your lender matters more than fundamentals. International Monetary Fund, IMF Working Paper, WP/15/127, 1–42.

Cerutti, E., Claessens, S., and Ratnovski, L., (2014). Global liquidity and drivers of cross-border bank flows. IMF, Working Paper, WP/14/69, 1–27.

Cerutti, E., Claessens, S., and Ratnovski, L., (2016). Global liquidity and cross-border bank flows. 63rd Economic Policy Panel meeting in Amsterdam, 1–36.

Cerutti, E., Correa, R., Fiorentino, E., and Segalla, E., (2015c). Changes in prudential policy instruments – a new cross-country database. Manuscript, International Banking Research Network.
Cerutti, E., Correa, R., Fiorentino, E., and Segalla, E., (2017). Changes in prudential policy instruments - A new cross-country database. International Journal of Central Banking, International Journal of Central Banking, vol. 13(2), 477–503.
Claessens, S., (2014). An overview of macroprudential policy tools. IMF Working Paper, WP/14/214, 1–37.
Claessens, S., (2015). An overview of macroprudential policy tools. Annual Review of Financial Economics (also IMF WP 14/214), 397–422.
Claessens, S., Ghosh, S.R., and Mihet, R., (2014). Macroprudential policies to mitigate financial system vulnerabilities. IMF Working Paper, 1–35.
Constâncio, V., (2014). The ECB and macro-prudential policy: from research to implementation. Speech at the 3rd Macroprudential Research Network Conference, Frankfurt, 23 June 2014.
Cruz, M., and Walters, B., (2008). Is the accumulation of international reserves good for development? Cambridge Journal of Economics, vol. 32, No. 5, 665–681.
De Nicolo, G., Favara, G., and Ratnovski, L., (2012). Externalities and macroprudential policy. IMF Staff Discussion Note, 1–23.
Eichengreen, B., and Rose, A., (2014). Capital controls in the 21st century. Journal of International Money and Finance, vol. 48, 1–16.
Federico, P.M., (2011). Systemic liquidity risk-taking in emerging markets. mimeo, 1–43.
Fernández, A.M., Klein, W., Rebucci, A., Schindler, M., and Uribe, M., (2015). Capital controls measures: A new dataset. NBER Working Paper, No. 20, 1–970.
Forbes, K.J., and Warnock, F.E., (2012). Capital flow waves: surges, stops, flight and retrenchment. Journal of International Economics, vol. 88(2), 235–251.
Freixas, X., Laeven, L., and Peydró, J.L., (2015). Systemic risk, crises, and macroprudential regulation. Boston, MA: MIT Press, 1–488.
Galati, G., and Moessner, R., (2011). Macroprudential policy - a literature review. BIS Working Papers 337, Bank for International Settlements, 1–38.
Galati, G., and Moessner, R., (2014). What do we know about the effects financial macroprudential policy? De Nederlandsche Bank Working Paper, No. 440, 1–25.
Gallagher, K.P., (2014). Ruling capital: Emerging markets and the reregulation of cross-border finance. Cornell University Press, 1–233.
Gallagher, K.P., Griffith-Jones, S., and Ocampo, J.A., (2012). Regulating global capital flows for long-run development. Pardee Center Task Force Report, Boston University, 1–142.
Gallagher, K.P., and Tian, Y., (2014). Regulating capital flows in emerging markets: The IMF and the Global Financial Crisis. GEGI Working Paper, No. 5 (Boston: The Frederick S. Pardee Center for the Study of the Longer-Range Future), 1–33.
Ghosh, A.R., Qureshi, M.S., and Sugawara, N., (2014). Regulating capital flows at both ends: Does it work? WP/14/188, 1–43.
Habermeier, K., Kokenyne, A., and Baba, C., (2011). The effectiveness of capital controls and prudential policies in managing large inflows. IMF Staff Discussion Note 11/14, 1–35.
International Monetary Fund IMF (2012). Toward operationalizing macroprudential policies: When to act? Chapter 3 in Global Financial Stability Report, September.
https://www.imf.org/external/pubs/ft/gfsr/2011/02/pdf/ch3.pdf
Korinek, A., (2010). Regulating capital flows to emerging markets: An externality view, mimeo.
Korinek, A., (2014). International spillovers and guidelines for policy cooperation a welfare theorem for national economic policymaking. Working Paper Johns Hopkins University and NBER, 1–44.
Korinek, A., and Sandri, D., (2015). Capital controls or macroprudential regulation? IMF Working Paper, WP/15/218, 1–34.
Korinek, A., and Sandri, D., (2016). Capital controls or macroprudential regulation? Journal of International Economics, vol. 99, 27–42.
Levin, A., Lin, C.-F., and Chu, C.-S.J., (2002). Unit root tests in panel data: asymptotic and finite-sample properties. Journal of Econometrics, Elsevier, vol. 108(1), 1–24.
Levy-Yeyati, E., (2011). Are capital controls effective? VoxEU.org, 20 January.

Levy-Yeyati, E., and Zúñiga, J., (2015). Varieties of capital flows: What do we know. HKS Faculty Research Working Paper Series, RWP15-025, 1–39.
Lim, C.H., Columba, F., Costa, A., Kongsamut, P., Otani, A., Saiyid, M., Wezel, T., and Wu, X., (2011). Macroprudential policy: What instruments and how are they used? Lessons from country experiences. IMF Working Paper, No. 11/238, 1–84.
Magud, N.E., and Reinhart, C.M., (2007). Capital controls: An evaluation. In Edwards, S., (eds.) Capital controls and capital flows in emerging economies: Polices, practices and consequences. Chicago: University of Chicago Press, 645–674.
Magud, N.E., Reinhart, C.M., and Rogoff, K.S., (2011). Capital controls: Myths and realities. Cambridge, National Bureau of Economic Research Working Paper 16805.
Mundell, R.A., (1963). Capital mobility and stabilization policy under fixed and flexible exchange rates. Canadian Journal of Economic and Political Science, vol. 29(4), 475–485. doi:10.2307/139336.
Ocampo, J.A., and Palma, J.G., (2008). The role of preventative capital account regulations. Chapter 7 in Ocampo, J.A., and Stiglitz, J.E., (eds.) Capital market liberalization and development, Oxford: Oxford University Press.
Ocampo, J.A., and Vos, R., (2008). Policy space and the changing paradigm in conducting macroeconomic policies in developing countries. BIS Papers 36, February 2008, 28–45.
Ostry, J.D., Ghosh, A.R., Chamon, M., and Qureshi, M.S., (2012). Tools for managing financial-stability risks from capital inflows. Journal of International Economics, vol. 88(2), 407–421.
Ostry, J.D., Ghosh, A.R., Habermeier, K., Chamon, M., Qureshi, M.S., and Reinhardt, D.B.S., (2010). Capital inflows: the role of controls. IMF Staff Position Note, No. 10/04. Washington, D.C.: International Monetary Fund, 1–30.
Ostry, J.D., Ghosh, A.R., Habermeier, K., Laeven, L., Chamon, M., Qureshi, M.S., and Kokenyne, A., (2011). Managing capital inflows: what tools to use? IMF Staff Position Note, No. 11/06. Washington, D.C.: International Monetary Fund, 1–41.
Ostry, J.D., Ghosh, A.R., and Korinek, A., (2012). Multilateral aspects of managing the capital account. SDN/12/10. International Monetary Fund.
Papaioannou, E., (2009). What drives international financial flows? Politics, institutions and other determinants. Journal of Development economics, vol. 88(2), 269–281.
Qureshi, M.S., Ostry, J.D., Ghosh, A.R., and Chamon, M., (2012). Tools for managing financial-stability risks from capital inflows. Journal of International Economics, vol. 88(2), 407–421.
Reinhart, C.M., Calvo, G.A., and Leiderman, L., (1993). Capital inflows and real exchange rate appreciation in Latin America: The role of external factors. MPRA Paper 7125, University Library of Munich, Germany.
Reinhart, C.M., and Rogoff, K.S., (2008). This time is different: A panoramic view of eight centuries of financial crises. NBER Working Paper, No. 13882, 1–123.
Reinhart, C.M., Rogoff, K.S., and Magud, N.E., (2011). Capital controls: A meta-analysis approach. VoxEU.org, 24 March 2011, 1–46. Available at: http://voxeu.org/article/capital-controls-meta-analysis-approach.
Rey, H., (2013). Dilemma not Trilemma: The global financial cycle and monetary policy independence. in Proceedings of the Federal Reserve Bank of Kansas City Economic Symposium at Jackson Hole, 285–333.
Rey, H., (2016). International channels of transmission of monetary policy and the Mundellian Trilemma. NBER Working Papers 21852, National Bureau of Economic Research, Inc.
Rodrik, D., (2006). The social cost of foreign exchange reserves. International Economic Journal, vol. 20(3), 253–266.
Schoenmaker, D., and Wierts, P., (2011). Macroprudential policy: The need for a coherent policy, Duisenberg School of Finance Policy Paper, No. 13.
Turner, P., (2010). Macroprudential policies and the cycle. in The Financial Stability Board: An Effective Fourth Pillar of Global Economic Governance? Griffith-Jones, S., Helleiner, E., and Woods, N., (eds.), Special Report, The Centre for International Governance Innovation, 43–48.
Weitzman, M.L., (1974). Prices vs. quantities. Review of Economic Studies, vol. 41, 477–491.
Wooldridge, J.M., (2010). Econometric analysis of cross section and panel data (2nd eds.). Cambridge: The MIT Press, 1–644.
Wooldridge, J.M., (2012). Introductory econometrics a modern approach. South-Western College Publishing, 5th Edition, 1–912.