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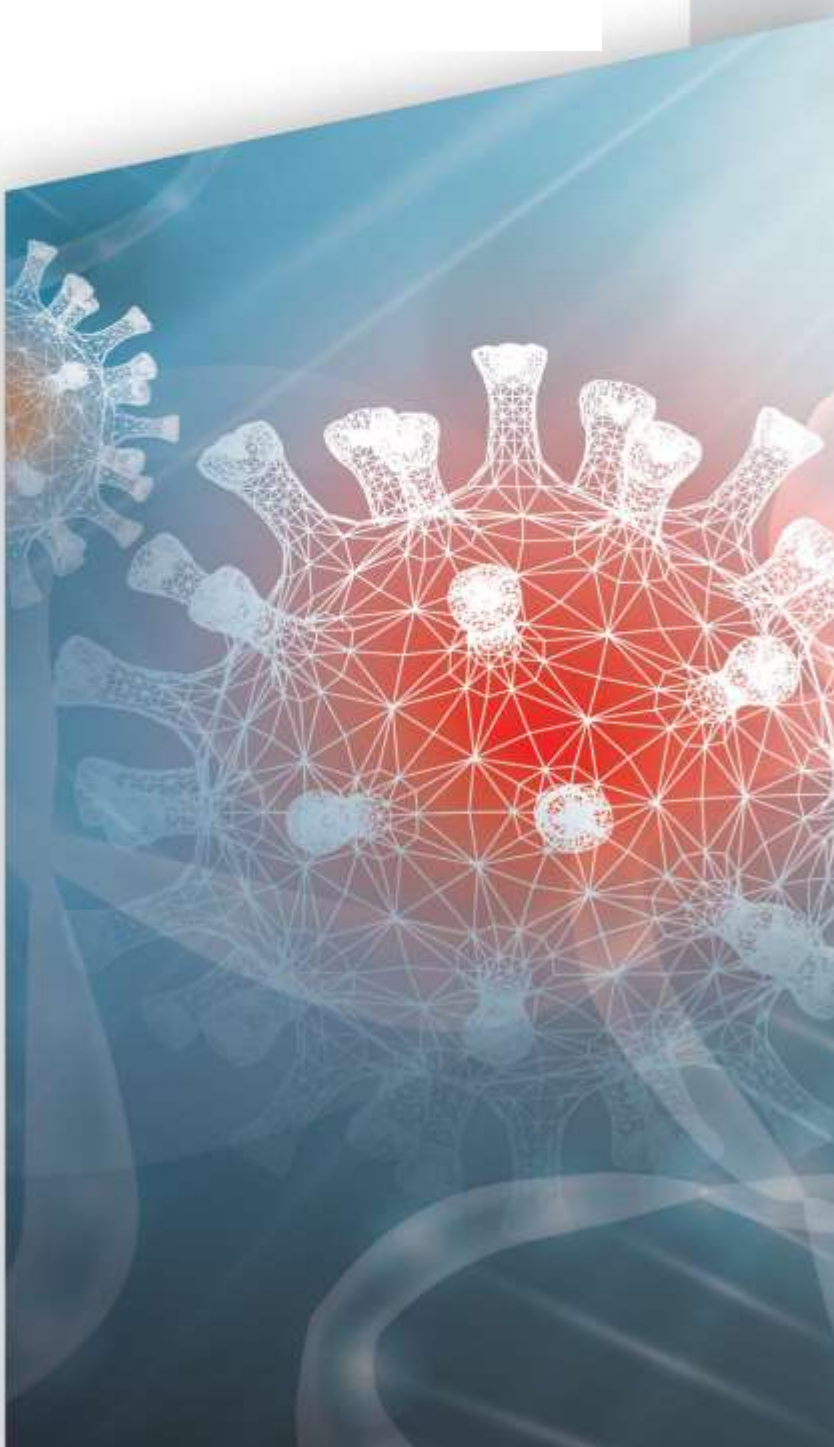
A critical assessment of macroprudential regulation and comparative regional experiences focusing on Latin America and the Caribbean



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About the COVID-19 Response and Recovery project

This paper is an output from the project "Response and Recovery: Mobilising financial resources for development in the time of COVID-19", which is co-ordinated by the Debt and Development Finance Branch of UNCTAD and jointly implemented with ECA, ECLAC and ESCAP. This project is one of the five UN Development Account short-term projects launched in May 2020 in response to the COVID-19 crisis.

The project aims to enable low-income and middle-income developing countries (LICs and MICs) from Africa, Asia-Pacific, and Latin America and the Caribbean to diagnose their macro-financial, fiscal, external financial and debt fragilities in the global context, and design appropriate and innovative policy responses to the COVID-19 pandemic leading toward recoveries aligned with the achievement of the Sustainable Development Goals (SDGs).

Abstract

This paper provides a critical assessment of macroprudential policies at the theoretical and practical levels focussing on the case of developing economies, including Africa, Asia and particularly Latin America and the Caribbean. It argues that macroprudential regulation remains an elusive concept and is of limited applicability. At the theoretical level, within mainstream economics, macroprudential regulation can only be rationalized by arguing that the growth and development of the financial sector creates market imperfections that lengthen the intermediation chain, weakening the link between savings and investment. Thus, from this perspective the purpose of macroprudential regulation is to ensure that savings flows into investment. At the practical level, survey evidence shows that there is no agreement on the meaning of financial stability and even less so of systemic risk. Also, macroprudential regulation is not identified as being a priority among financial regulators. Macroprudential regulation focusses for the most part on the financial sector ignoring the fact that other economic sectors such as the non-financial corporate sector is a growing source of financial fragility due to its increased financialization. At a more general level, macroprudential regulations address, only partially, the financial vulnerabilities of developing regions such as those of Africa, Asia and Latin America and the Caribbean created by increased external financial openness and greater price flexibility.

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1. Introduction[1]

Macroprudential policies are broadly defined as those aimed at reducing systemic risk, either over time or across institutions and markets. Systemic risk is defined as "a risk of disruption to financial services that is caused by an impairment of all or parts of the financial system and has the potential to impose serious negative consequences on the real economy" (CEF/IMF/BPS, 2009, quoted in IMF, 2010).[2]

The specific systemic risks can include risks of excessive domestic credit growth and associated asset price inflation; risks of exchange rate volatility arising from investor activity in on-shore and off-shore currency markets; risks of capital flow volatility because of investor behaviour, especially non-residents; risks of domestic banking fragility arising from temporary unexpected shocks (like the pandemic) and predicted other shocks (like climate change); and risks of external debt crises.
Macroprudential measures ought to identify early indicators of weakness, pre-empt, and limit the build-up of such risks and create buffers against pro-cyclical feedbacks of financial instability.

The development of macroprudential regulation was the result of necessity. Prior to macroprudential regulation the traditional approach to financial regulation focused, to a great extent, on the establishment of capital adequacy standards (CAS) and on ensuring their compliance by individual financial institutions; that is, on micro-prudential regulation. This was complemented during stress or crisis periods with the provision of liquidity to the financial system.

The CAS regulatory approach was not a deterrent of the occurrence of financial crises. In fact, the number of crises following the first Basel accord on CAS (1988) increased over time and became more systemic. Most importantly, CAS were not able to accomplish their objective since crises were shown to an endogenous source of fragility and instability. This provided an important reason to provide a more comprehensive and macroeconomic approach to financial regulation.

[1]The authors wish to thank Daniela Prates and Penelope Hawkins for very valuable comments to a first draft of this paper.

[2]According to part of the literature on macroprudential regulation, systemic risk has two key dimensions: a temporal one (how the risk of the financial system evolves over time, how it accumulates and how it is linked to the real business cycle); and an intersectoral, one (how risk is distributed through the financial system and what interconnections and common exposures may exist among its agents) (IMF, 2010; Kaufman and Scott, 2003; Pérez Caldentey and Cruz, 2012).

The empirical evidence for the period 1970-2017 shows an increase in systemic banking and currency crises. At the global level the number of systemic banking and currency crises increased from 28 in the 1970s, to 114 in the 1980s, to 158 in the 1990s. Between 2000 to 2017 there were 87 systemic banking and currency crises (Laeven and Valencia, IMF, 2019).[3] In Latin America and the Caribbean recurrent financial crises include the 1980s debt crisis, the Tequila Crisis (1994-1995), the East Asian Crisis (1997-1998), the Brazilian-Russian Crisis (1999), the Argentine Crisis (2001-2002), and the Global Financial Crisis (2008-2009).

Also, since the 1990s, crises have also exhibited a more systemic character. That is, countries that are not at the epicentre of a crisis tend to become vulnerable to contagion. This is exemplified by the Global Financial Crisis of 2008-2009 (GFC), where 91 economies (representing 67% of world GDP) experienced a contraction of output (Chen et al., 2019).[4]

The increased frequency and systemic character of financial crises indicates that markets, and particularly financial markets, do not allocate and evaluate risk efficiently. This also disproves the hypothesis that asset prices, by reflecting all available information, ruled out the possibility of arbitrage and financial speculation.[5] Just as financial markets are incapable of pricing risk correctly, financial institutions have

[3] A systemic banking crisis is an event that meets two conditions: (i) significant signs of financial distress in the banking system (as indicated by significant bank runs, losses in the banking system, and/or bank liquidations); (ii) significant banking policy intervention measures in response to significant losses in the banking system. Currency crises are defined as sharp depreciations of the currency relative to the US dollar (Laeven and Valencia; IMF, 2019, pp.4 and 9).

[4] See also FRED (2020)

[5] Financial market efficiency has two components: informational efficiency and arbitrage efficiency. In its simplest form, informational efficiency means that the spot price is the best predictor of the future price. This is important because it suggests that prices reveal all information existing in an economy. This property implies that the price of any asset must be equal to its fundamental value or spot price —namely the present value of the expected income (payments) from dividends on an asset over its entire life discounted at the risk-free rate. The expected income is calculated through a stochastic process. Arbitrage efficiency means that, through the buying and selling process, no one can make a profit in one state of the economy without suffering losses in another state. This implies that no economic agent can systematically beat market expectations or take advantage of other agents with less information in the market.

proved unable to protect real and financial asset values or prevent their collapse (Greenspan, 2008).[6]

Financial crises can have medium to long-term effects on growth, investment, and income distribution. In the five years prior to the GFC (2003-2007) world growth averaged 4.1%. In the five years following the GFC (2010-2014) world growth averaged 3.3%. Since the GFC (2010-2019) world growth has averaged 3.1% and 2.6% if the year 2020 is included. Similarly, In the five years prior to the GFC (2003-2007) the growth of world investment averaged 4.9%. In the five years following the GFC (2010-2014) the growth of world investment averaged 3.4%, and in the decade following the GFC (2010-2019) – and before the COVID-19 pandemic, the growth of world investment has averaged 3.2%. As a result, investment rates have been falling in most countries (this trend is particularly acute in Latin American and the Caribbean, and contrasts with growing debt in some countries).[7]

For developing economies, including those of Latin America and the Caribbean, macroprudential regulation is also important for economic stability and growth since their increasing external financial openness jointly with their domestic policies implemented to accommodate this greater financial openness, has made their performance highly dependent on the vagaries of foreign financial flows and especially short-term flows.

Since the 1990s developing economies have become increasingly dependent on short-term flows. This dependency has become more prevalent since the 2000s. In the case of Latin America and the Caribbean, available empirical evidence for the periods 2003-2009 and 2010-2019 show that the share of short-term inflows in total inflows rose from 37.3% to 52.1%.[8] Moreover, the increased reliance on short term flows has been accompanied by a process of external debt accumulation for all developing regions since the end of the GFC. Between 2010 and 2019 external debt as percentage of exports of goods and services in the cases of Asia, Latin America and the Caribbean, Middle East and Central Asia and Sub-Saharan Africa increased from 60% to 87%, 132% to 192%, 75% to 126% and from 75% to 174% respectively.[9]

Since the 1990s, there has been monetary and fiscal space in developing countries has narrowed. In the case of Latin America most of the countries of the region have signed investment agreements (jointly with

[6] The prevailing consensus on the post-GFC financial system can be summarized as follows: "One of the main reasons the economic and financial crisis became so severe was that the banking sector of many countries had built up excessive on-and off-balance sheet leverage. This was accompanied by a gradual erosion of the level and quality of the capital base. At the same time, many banks were holding insufficient liquidity buffers. The banking system therefore was not able to absorb the resulting systemic trading and credit losses, nor could it cope with the reintermediation of large off-balance sheet exposures that had built up in the shadow banking system. The crisis was further amplified by a procyclical deleveraging process and by the interconnectedness of systemic institutions through an array of complex transactions. During the most severe episode of the crisis, the market lost confidence in the solvency and liquidity of many banking institutions. The weaknesses in the banking sector were transmitted to the rest of the financial system and the real economy, resulting in a massive contraction of liquidity and credit availability. Ultimately the public sector had to step with unprecedented injections of liquidity, capital support and guarantees, exposing the taxpayer to large losses" (BCBS, 2009, pp. 1–2).

[7] World Bank (2021a).

[8] See Pérez Caldentey and Vernengo (2021a).

[9] IMF (2021a).

trade agreements) and/or joined the Organisation for Economic Co-operation and Development (OECD), which prevent them from imposing restrictions and controls on the financial account of the balance of payments, including on short-term flows.[10] In addition, the majority of countries in the developing world have moved towards greater market flexibility which include more flexible exchange rate regimes (71% of total Latin American and the Caribbean economies report flexible exchange rate regimes in place).[11]

Some argue that the Covid-19 pandemic has made the case for macroprudential regulation more pressing. Covid-19 has had major effects on developing countries in many ways, not only because of the effects on health and well-being of the people, but through the severe and often devastating effects on economies. These economic impacts have operated within the domestic economy, through closures and lockdowns that have affected economic activity, livelihoods and employment; and they have also operated through the impact of international economic processes that have affected trade and capital flows. For several developing countries, the external impacts of declining trade in goods and services, falling remittances and—most of all—volatile capital flows and pressures arising from external debt, have sometimes been so severe that they have accentuated and sometimes even dwarfed the domestic effects.[12]

Latin America and the Caribbean has been one of the most affected regions within the developing world - in 2020 the worst contraction on record (-6.8%), which has caused a significant increase in the unemployment rate (8.1% and 10.7% in 2019 and 2020, respectively, representing 44 million people) and poverty levels (185.5 to 209 million in 2019 and 2020). Moreover, the sharp decline in investment (-10% in real terms) will severely hamper future capital accumulation, as well as the ability of the region's economies to generate growth and employment and recover. Moreover, the growth rebound expected in the region in 2021 (5.9%), resulting from a low basis of comparison relative to 2020 within a context of deepened structural problems is unlikely to persist. It is likely to provide only temporary respite from the current economic situation and to prove insufficient to reduce the region's financing gap or improve its debt profile.[13]

This paper provides a critical assessment of mainstream macroprudential policies at the theoretical and practical levels focussing on the case of developing economies, including Africa, Asia and particularly Latin America and the Caribbean. It argues that the limitations of CAS, and more specifically the fact that it proved to be an endogenous source of financial instability, lead to the adoption of a macroeconomic approach to financial regulation. This paper is a companion paper to A policy/oriented study on capital flow regulation drafted for the same project (Project paper 10.21). The current paper will be followed by a third paper that will present an alternative macroprudential view to that of the mainstream.

As conceptualized within the mainstream, macro prudential regulation remains an elusive concept and is of limited applicability. At the practical level macroprudential regulation consists

[10] For instance, Chile, Mexico, and Colombia have been incorporated as members of the OECD).

[11] IMF (2020b). In practice countries intervene in foreign exchange markets so that they really adopt managed exchange rate regimes.

[12] See Fokko Klein (2020) for the case of Latin America.

[13] ECLAC (2021)

in a series of measures not necessarily interconnected or articulated, which focus mostly on the banking system, to limit credit expansion, improve solvency, decrease interconnectedness, and avoid excessive leverage. Survey evidence shows that there is no agreement on the meaning of financial stability and even less so of systemic risk. Also, macroprudential regulation is not identified as being a priority among financial regulators. Moreover, it does not address all the sources of financial fragility in developing economies. Macroprudential regulation focusses on the financial sector, mostly on the banking sector, ignoring the fact that other economic sectors such as the non-financial corporate sector is a growing source of financial fragility due to its increased financialization.

Within mainstream economics, one way to rationalize the different of measures proposed by macroprudential regulation is by arguing that the growth and development of the financial sector creates market imperfections that lengthen the intermediation chain, hence weakening the link between savings and investment. Thus, from this perspective the purpose of macroprudential regulation is to ensure that savings flows into investment.

The paper is divided in nine sections. Sections two and three focus on the limitations of the CAS approach and describe the theorical underpinnings for macroprudential regulation within mainstream economics. Section four describes how macroprudential regulation is applied in practice. Sections five, six and seven, present evidence on the application of macroprudential regulation to selected country case studies in Africa (Ethiopia, Ghana, Kenya, Nigeria, South Africa, and Zambia), Asia (India, Indonesia, Malaysia, and Thailand) and Latin America and the Caribbean (Brazil, Chile, Colombia, Mexico, and Peru) highlighting their strengths and weaknesses. This section also draws lessons for the adequate design of macroprudential policies. The last section concludes.

2. Capital adequacy standards (CAS) as a source of financial fragility and instability

Prior to the GFC financial regulation focused on ensuring that financial institutions, and more precisely banks, meet a certain capital adequacy threshold. The establishment CAS by the Basle agreements pursues the proper internalization of the risks that financial institutions face individually (including among the most relevant credit, liquidity, interest rate and exchange rate risks). Since the primary function of capital is the protection against unexpected losses, increased capital requirements would strengthen the solvency and stability of financial institutions. The Basel Committee on Banking Supervision (BCBS)[14] through Basel I (1988), Basel II (2004) and Basel (2010) established that regulatory capital should be at least equal to 8% of risk-weighted assets. That is:

$$(9)\ Capital\ adequacy\ ratio = \frac{Capital}{Assets\ weighted\ by\ risk} \geq 8\%$$

[14] The BCBS holds chief responsibility for formulating global standards for prudential regulation of the banks; and it serves as a forum for periodic cooperation on banking supervision. It consists of 45 members from 28 jurisdictions, representing central banks and supervisory authorities. In addition, the Committee has nine observers, including central banks, supervisory groups, international organizations, and other bodies.

However, rather than being an indicator of the solvency of financial institutions, the CAS approach turned out to be a source of endogenous financial fragility. This can be exemplified by analysing the behaviour of assets and liabilities during the upward phase of the economic cycle driven by, for instance, an expansionary monetary policy of the central bank.[15]

A boom phase characterized by high profitability and low risk tends to increase capital ratios and thus generate the impression of greater solvency and better financial conditions. In turn, this encourages the financial system to build up its asset positions and, more specifically, the increase in loans based on the current economic conditions. However, this often occurs to the detriment of credit standards. Empirical evidence for some developed countries reflects this stylized fact by showing that provisions tend to decrease in boom periods (Cavallo and Majnoni, 2001; Hahm et al., 2012).

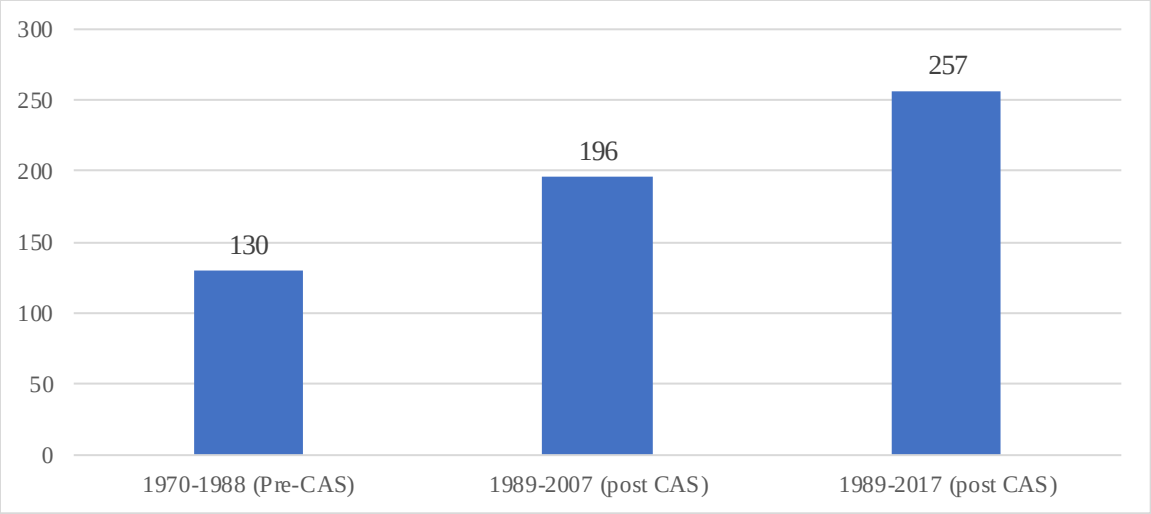
On the liability side, financial institutions become more dependent on liquidity provided by other financial institutions. In this situation, the financial system tends to skew the composition and structure of liabilities towards a higher level of indebtedness, that is, towards higher leverage ratios,[16] so that the relationship between the growth rate of assets and that of leverage is positive. The correlation coefficient between the two variables for a sample of 21 U.S. banks for the period December 2003 to September 2010 equaled to 0.70 for the entire sample and 0.89 for investment banks.[17]

High leverage levels create considerable opportunities for profitability because the higher is the leverage level, the higher is the return on capital. In this regard, the expectation of higher returns provides an incentive for excessive leverage. The rate of return of equity (ROE) (a measure of profitability) equals the rate of return on assets (ROA) time leverage (L) so that $ROE = ROA * L \Longrightarrow \Delta L \Longrightarrow \Delta ROE \; for \; \overline{ROA}$. But at the same time, however, a greater dependence on debt generates greater fragility since bigger risks are assumed due to the higher exposure and vulnerability to illiquidity and, even more important, to insolvency.[18]

Following the above logic, the implementation of the CAS approach to financial regulation did not seem to have made a difference regarding the occurrence of financial crises. Throughout the world the number of systemic banking and currency crises increased from 130 between 1970-1988 (pre-CAS) to 196 between 1988-2007 (post-CAS) (if a similar number of years is considered for both periods). For 1989 to the latest year available (2017) the number of systemic banking and currency crises reached 257 (Figure 1).

[15] For the relation between monetary and macroprudential policies see Bush et al. (2021); Cerutti et al. (2017); Goodfriend and King (1988); Goodhart (1993); and Sinclair (2000).
[16] Leverage (debt to equity ratio) reflects the extent to which financial intermediaries use borrowing to finance the acquisition of their assets.
[17] Pérez Caldentey and Cruz (2012)
[18] See Barajas et al. (2010)

Figure 1
Number of systemic banking and currency crises pre and post CAS (1970-2017)



Note: A systemic banking crisis is an event that meets two conditions: (i) significant signs of financial distress in the banking system (as indicated by significant bank runs, losses in the banking system, and/or bank liquidations); (ii) significant banking policy intervention measures in response to significant losses in the banking system. Currency crises are defined as sharp depreciations of the currency relative to the US dollar (Laeven and Valencia, IMF, 2019, pp.4 and 9).
Source: Laeven and Valencia, 2019.

The rising number of crises coexisted with a decline in the rate of inflation, suggesting that price stability does not ensure financial stability. Since the beginning of the 1970s world inflation has trended downwards (10%, 8.0%, 6.9%, 4.1% and 2.6% in the 1970s, 1980s, 1990s, 2000 and 2010 decades). The amplitude of inflation measured by the standard deviation also declined from the 1990s onwards (2.3, 1.7 and 1.0 for the 1990s, 2000, and 2010 decades).[19]

Prior to the GFC, the financial system more than met the requirements imposed by Basel II in some of the countries that were heavily affected by this crisis, such as the United Kingdom, the Euro Zone and including the USA that was its epicenter. From 2005 to 2007, capital requirements for the Euro Zone, United Kingdom and the United States were above 12% on average.[20]

[19] World Bank (2021a).
[20] Pérez Caldentey and Cruz (2012).

Also, since the middle of the 1990s crises have exhibited a greater systemic character.[21] That is, the effects of crises were felt not only in its epicentre, but also in the grouping of countries to which that country belongs through the so-called contagion effect. Available evidence for the period running from January 1991 to January 2004 shows that both the Tequila (1994) and Russian (1998) crises affected all emerging market economies (EMEs). The rise in risk for this group of economies is captured by the sharp increase in the EMBI for emerging market economies.[22] More recently during the GFC, 91 economies (representing 67% of world GDP) experienced a contraction of output (IMF, 2019).[23]

3. The turn from micro to macroprudential regulation: the mainstream approach

The failings of CAS, which became obvious during the GFC, did not lead policy makers to discard this approach to financial regulation. It rather led to the conviction that regulation should focus not only on minimizing the potential risk of individual financial institutions but also that of the entire financial system. In short, micro prudential regulation needed to be complemented with macroprudential regulation.

The overall objective of macroprudential regulation is to maintain the stability of the financial system as a whole through the minimization of systemic risk. Systemic risk is defined as "the risk of disruption of financial services caused by a disruption of all or part of the financial system that

[21] From 1948 until the present, the United States has had eight annual contractions in GDP (1949, 1954, 1958, 1974, 1975, 1982, 1991 and 2009). The contraction in 2009 (-2.5%) is by far the largest contraction the United States has experienced. The second largest contraction was in 1982 (-1.8). The other contractions were always below -1.%.In the case of the Euro Zone, available evidence for the period 1995-2018 that the Euro Zone in the aggregate experience two contractions: one in 2009 and one in 2012. The one in 2009 (-4.5% rate of growth of GDP for that year) far out spaced the 2012 contraction (-0.8%).

[22] See, Calvo (2016, p.8). The Emerging Markets Bond Index (EMBI) spread (the difference between the interest rates on dollar-denominated bonds issued by EME governments and United States Treasury Bonds, considered risk-free). The EMBI is based on the behaviour of the sovereign bonds issued abroad by each country. The less certain a country is to meet its obligations, the higher its EMBI will be, and vice versa. The lowest rate an investor would require to invest in a particular country would be the United States Treasury Bond rate plus the country's EMBI.

[23] See Chen et al. (2019).

may have a significant negative impact on the real economy."[24] This includes limiting the formation of booms/busts of asset and credit bubbles and minimizing the economic and social costs associated with a credit crunch resulting from an excessive contraction of the balance sheets of financial institutions facing a common shock (Hanson, Kashyap, and Stein, 2010).

Within the mainstream consensus, **s**ystemic risk and thus the need for macroprudential regulation are justified due to the existence of market imperfections and, more precisely to frictions in the supply of credit.[25]

According to this view the way in which activity is financed is determined by real forces and savings determines investment (Shin, 2010). As a longer intermediary chains, reflected in the growth of the number and variety of financial institutions, hampers the relationship between decisions to save and invest, there is a justification for regulation on a macroprudential basis. Thus, macroprudential policy is really about enabling the channelling of savings towards investment.

The conceptual basis for macroprudential regulation from which specific policy actions can be derived, can be explained through a balance sheet example that consolidates the assets and liabilities of financial institutions within a given economy (Shin, 2010). Table 1 shows the consolidated assets and liabilities of this financial system.

Assets include loans to end-user borrowers, including those extended to households, firms and government (P_i). They also include loans made by bank *i* to other financial institutions, in this case other global banks or another type of financial institution (P_{ij} where *j* denotes other financial institutions). In turn, loans from bank *i* to other financial institutions (P_{ij}) are equal to the value of bank *j* liabilities held by bank *i* (D_{ji}) and to the share of bank *j* liabilities in the total liabilities of other financial institutions held by bank *j* $\left(\pi_{ji}\right)$ (for example, interconnectedness). Liabilities include debt held by the bank issued by other financial institutions (D_i) along with its capital/equity (E_i).

[24]The origin of the term macroprudential dates back to the seventies (see Clement, 2010). Public references date back to the mid-1980s receiving new impetus from the early 2000s (Galati and Moessner, 2013; 2018). According to part of the literature on macroprudential regulation, systemic risk has two relevant dimensions, a temporary one – which is about how the risk of the financial system evolves over time, how it accumulates and how it is linked to the real economic cycle – and another intersectoral – which is about how risk is distributed throughout the financial system and what interconnections and common exposures can exist among its agents (IMF, 2010). See also Kaufman & Scott (2003).

[25] According to Adrian and Shin (2008, p. 13) these frictions refer: "…to the set of principal-agent frictions that operate at the level of the financial intermediaries themselves. These frictions result in constraints on balance sheet choice that bind harder or more loosely depending on the prevailing market conditions. The fluctuations in haircuts and regulatory capital ratios that are critical in determining the leverage of financial intermediaries can be seen as being driven by the fluctuations in how hard these constraints bind. When balance sheet constraints bind harder, credit supply is reduced.'' Asymmetric information between lender and borrower can also be source of friction in the supply of credit (Stiglitz & Greenwald, 2003). Bernanke and Gertler (1995) provide an overview of financial frictions. Fabian et al. analyze the relation between the bank lending channel and macroprudential policies.

Table 1
Consolidated balance sheet

Assets	Liabilities
Loans to end-users (P_i) ✓ Households ✓ Business ✓ Government	**Debt** (D_i) ✓ Non-bank agents/institutions ✓ Banks
Intermediary loans (P_{ij}) Interbank loans	**Capital/Equity** (E_i)

Source: On the basis of H. Shin (2010).

This consolidated balance sheet breaks down credit growth into leverage (λ), outside funding of the banking system (in other words deposits) $(1-\Pi)$ (where Π is interconnectedness), and equity (E). Leverage is defined as the ratio of assets to equity, that is $\lambda = \frac{A}{E}$ where $A =$ assets and $E =$ equity. Credit growth is formally expressed through identity (1), which shows each of these components in aggregate for the financial system as a whole (See Annex 1 for a detailed derivation)

(1) $P \equiv (\lambda - 1) * (1-\Pi) * E + E$

- P: Credit growth (e.g. bank loans)
- $(\lambda - 1)$: Leverage
- $(1-\Pi)$: External funding of the banking system as a whole (residents and non-residents).
- E: Equity

Note that if leverage is defined as the ratio of assets to equity ($\lambda = \frac{A}{E}$), then $\lambda - 1$ is equal to the debt-to-equity ratio (that is, $\lambda - 1 = \frac{A}{E} - 1 = \frac{A-E}{E} = \frac{D}{E}$, where $D =$ debt). Substituting this expression in identity (10) shows that credit growth is explained by the proportion of bank debt (obligations) that originates outside the financial system (that is outside savings decisions), plus equity. In other words:

(2) $P \equiv D * (1-\Pi) + E$

Identity (2) reflects the fact that credit can expand in aggregate, either through greater leverage, or through higher capitalization of the banking system, or through an increase in funding from sources outside the financial system (that is from savings decisions).

In this accounting framework, the proposed regulatory initiatives give rise to three types of macroprudential interventions. The first category of intervention is regulatory and aims to moderate leverage and make it less procyclical. It includes limits on leverage growth, countercyclical capital requirements and measures that restrict liquidity creation by the banks, such as liquidity requirements.

The second type of intervention seeks to moderate the degree to which credit fluctuates, by applying countercyclical regulations. The third type aims to reform the market structure of financial institutions, with a view to shortening the financial system intermediation chain, reducing interconnectedness and strengthening the linkage between savings and investment.

4. Macroprudential regulation in practice: what does the evidence reveal?

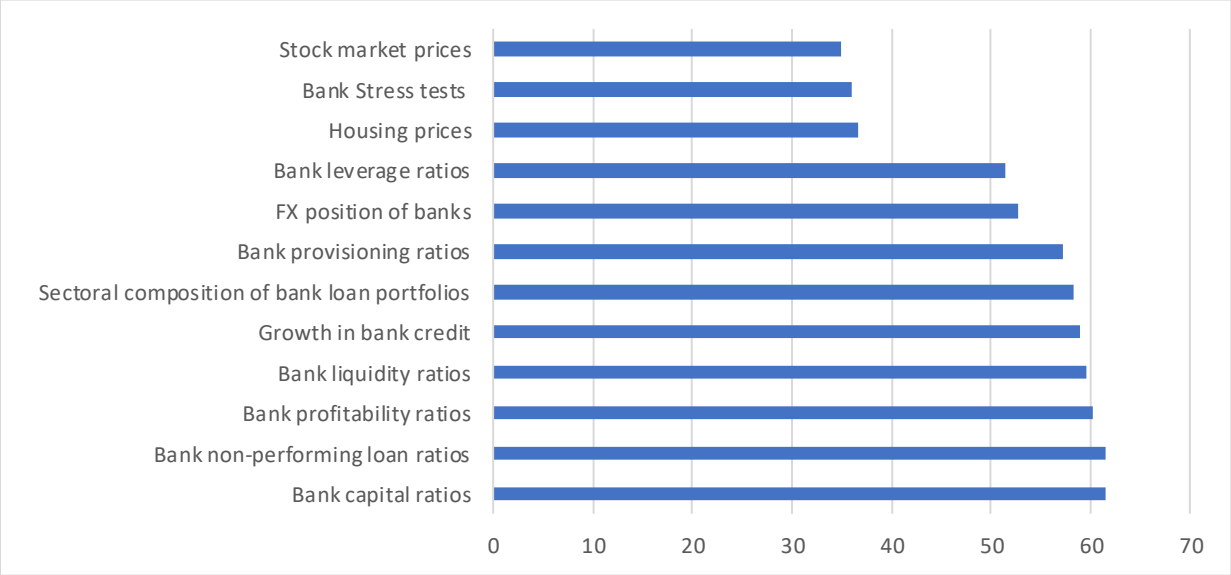
Following on the above conceptual basis, macroprudential regulation focusses mainly on financial institutions, in particular banks, ignoring the fact that other sectors of the economy such as non-financial corporations are also a source of financial fragility and instability.[26] It consists of a wide variety of instruments, affecting the incentives and constraints banking institutions face.[27] These include capital (e.g. countercyclical capital buffers), asset (e.g. loan-to-value ratios) and liabilities side (e.g. levy) tools (Shin, 2016, p. 100). The available evidence indicates that the Central bank, or supervisory agency is responsible for macroprudential policy. Macroprudential policy is based on a series of indicators to assess the existence of systemic risk (see figure 2). The indicators refer, in the main part, to the banking system which reflects the presumption that financial instability originates only in the financial system. The existence of systemic risk is gauged on a host of different indicators.[28]

[26] Three initiatives that exemplify the application of the conceptual framework detailed in section 3 include Basel III (2010), the design of a methodology to classify and monitor banks which are considered systemically important and the Dodd-Frank Wall Street Reform and Consumer Act Protection in the United States (2010). See, Acharya (2012), BCBS (2019), Tarullo (2009) and FSB (2019 and 2021). See also Financial Stability Forum (2007). There is a clear difference between macroprudential regulation and Minsky's approach to financial instability that considers that all economic sector (including households when owning residential property) are a source of financial fragility. See, Minsky (1982 and 1986).

[27] See for example Stiglitz and Greenwald (2003) pp. 208-233. Both authors call it the 'portfolio approach' to financial regulation.

[28] See also Alam et al. (2019)

Figure 2
Factors included in the assessment of systemic risk.
Percentage of the total (2019)



Note: The data are based on a financial regulation survey undertaken by the World Bank comprising 161 countries.
Source: On the basis of World Bank (2021b).

However, in practice, macroprudential policy is complicated. For one thing, there is no agreement on the precise meaning of financial stability nor a consensus definition of the terms. It may imply both micro and macro prudential supervision, as well as resolution and/or crisis management. In fact, central bank laws adopt a variety of terms to denote financial stability, and this impinges on its supervisory/regulatory role (Table 2).[29]

[29] See Bruno et al (2015) for a comparative assessment of macroprudential policies.

Table 2
Conceptions of financial stability in central bank's mandates for selected countries

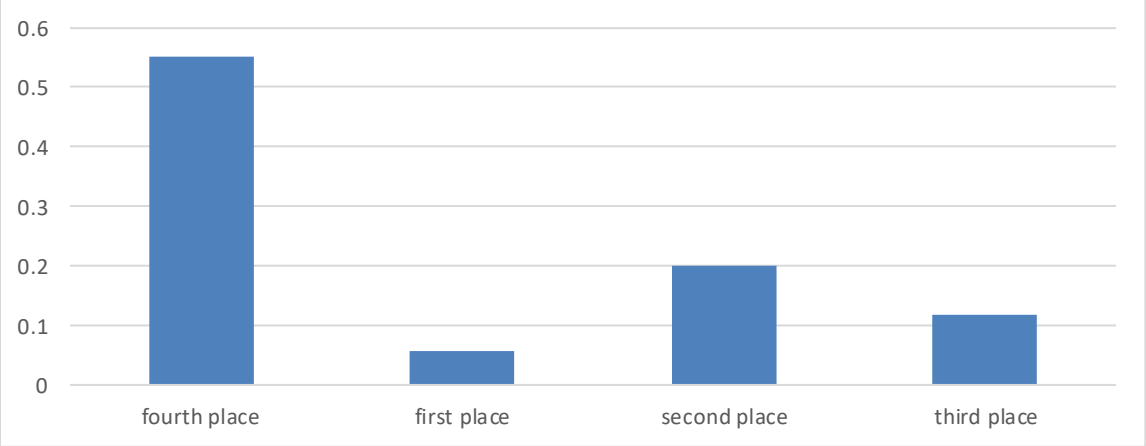
Objective	Country cases
Stability of the financial system/financial stability	Bahamas, Botswana, Chile, EMU (and member states), Ireland, Kosovo, Mauritania, Mauritius, Mexico, Montenegro (CB Law), Myanmar, Papua New Guinea, Paraguay, San Marino, Serbia, Solomon Islands, Sri Lanka, Tonga (Constitution), Tunisia, United Kingdom, Ethiopia, Namibia, Seychelles, Uruguay, Gambia, Georgia, Ireland, Israel, Japan, Kazakhstan, and New Zealand, Argentina, Iceland, Korea, Malaysia, Montenegro (Constitution), Oman, Singapore, and Tonga (CB Law), Thailand and Zambia
Stability of the banking system	Armenia, Azerbaijan, Belarus, Ukraine, and Turkmenistan, Albania
Stable and/or competitive market-based financial system	Afghanistan, Iraq, Macedonia, Moldova, and Yemen.
Financial sector confidence	Bahrain
Liquidity and solvency of financial institutions	Brazil
Stability/functioning of the banking and financial system/sector	Djibouti, Nepal, and Qatar
Functioning of the financial system	Dominican Republic
Sound financial structure	ECCU, Malawi, and Maldives
Integrity of the monetary and banking system	Egypt (Constitution)
Banking system soundness	Egypt (CB Law) and Sudan
Banking and credit systems (*plural*)	Ghana
Stability of the financial intermediary system	Hungary

Source: On the basis of Kahn (2017)

Also, the most important instrument used by banking supervisors are counter-cyclical capital requirements which points to the fact that financial regulation remains micro-based. A recent survey on financial regulation undertaken by the World Bank comprising 161 countries worldwide shows that only 6% ranked macroprudential policy as the most important activity in banking supervision. [30] Besides small islands (Curaçao, Macao SAR, Marshall Islands, Vanuatu), Angola, China, Bangladesh, Ukraine, and Taiwan stand among those few emerging market economies (EMEs) that view macroprudential policy as a central pillar for banking regulation. On the other hand, 55% of respondent assign to macroprudential policies the lowest ranking.

[30] These include in Asia: Bangladesh, China, Hong Kong SAR, China, Indonesia, Korea, Rep., Pakistan, Philippines, Singapore, Malaysia, Sri Lanka, Taiwan, China, Thailand, Vietnam, India. Latin America and the Caribbean: Argentina, Brazil, Chile, Costa Rica, Dominican Republic, Ecuador, Trinidad and Tobago, El Salvador, Belize, Guatemala, Honduras, Mexico, Paraguay, Peru, Uruguay, Colombia; G7: Japan, Canada, France, Germany, United Kingdom, United States, Italy; Africa: South Africa, Nigeria, Togo, Rwanda, Tonga, Morocco, Kenya, Ghana, Angola, Tunisia, Lesotho, Liberia, Senegal, Uganda, Madagascar, Malawi, Mali, Congo, Democratric. Republic.

Figure 3
Importance for Macroprudential supervision withing Banking supervision framework (First=most important, fourth=least important)

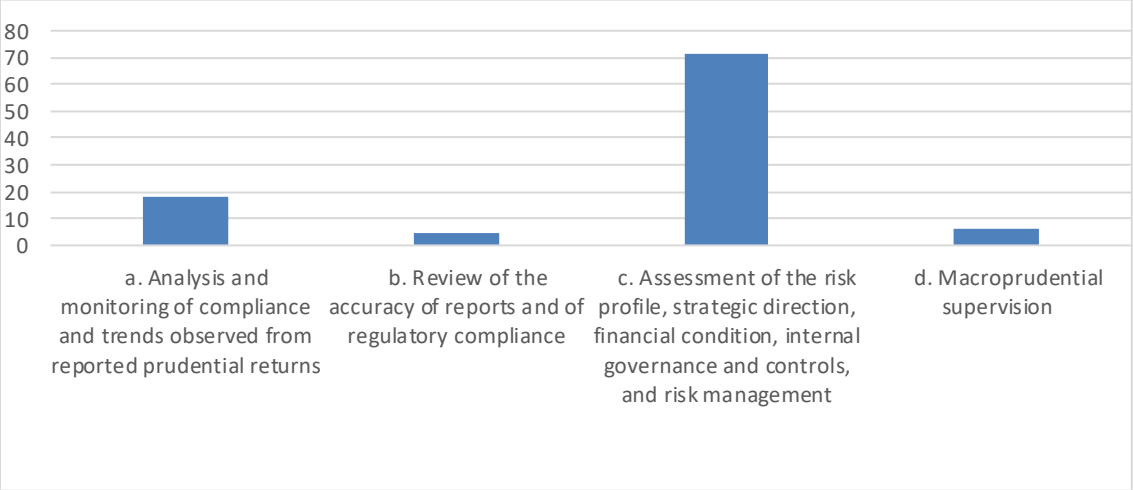


Source: On the basis of World Bank (2021b).

The low ranking for macroprudential activity signals that banking supervision is still primarily focused on microprudential supervisory.[31] This is further illustrated by looking at figure 4 which ranks macroprudential activity as the least important for banking supervisors among the following choices: a) analysis and monitoring of compliance and trends observed from reported prudential returns; b) review of the accuracy of reports and of regulatory compliance; c) assessment of the risk profile, strategic direction, financial condition, internal governance and controls, and risk management; and iv) macroprudential supervision. The survey shows 71% of all participants placed the assessment of banks' risk profile (option c) and the monitoring of compliance rules (option a) as their priority and only 6% identified macroprudential regulation as the most important activity.

[31] The measures involved are different from 'microprudential measures' that are taken to refer to adjustments that reduce the risk of failure of individual institutions. Thus, with reference to banking, the IMF defines microprudential measures as those addressing "the responses of an individual bank to exogenous risks and do not incorporate endogenous risk and the interconnectedness with the rest of the system." (Osinski et al 2013, p. 6).

Figure 4
Which is the most important activity for banking supervision? (Percentage of total)



Source: On the basis of World Bank (2021b).

There are nonetheless regional differences that are worth highlighting. G7 countries unanimously indicate macroprudential supervision as the activity with least importance for banking supervision. In the case of Africa, Latin America and the Caribbean and Asia, 61%, 47% and 36% of the respondents to the survey believe that macroprudential activity is the least important among banking supervisors. The regional differences are perhaps explained by the fact that both Latin America and Asia are regions with a history of financial and banking crises and recognise the importance of macroprudential regulation.

These results are coherent with more detailed analysis at the regional level (Figure 6), which shows that the most relevant tool for the management of the business cycle by the G7 are counter-cyclical capital requirements which are mostly a micro-prudential tool. In the case of developing regions, Asia emerges as the region that on average has adopted a larger set of measures. The evidence shows that 55% of the countries report using restriction on borrowers, instruments, and activity; an additional 50% report to adopt temporary restrictions on dividend and bonuses, and 44% also dispose of counter-cyclical loan to value ratios. To a lower extent, Asian countries also adopt counter-cyclical capital requirements (32%), restrictions on financial sector balance sheet (20%) and contracyclical provisioning requirements (22%). After the GFC, South Korea have also adopted restrictions on banks 'positions in FX derivatives that was the main driven of the huge contagion-impact of the GFC

In Latin America, countercyclical provisioning requirements – i.e. specific amount that banks need to set aside in good times above the mandatory provisioning requirement - are the most frequently available toolkit as 45% of all respondents reported to adopt them, a value two times higher than the average sample of 21%. Also, 25% of LACs' supervisors reports applying restrictions on foreign currency denominated lending, well above the average sample of 16%. At the country level Brazil also adopted limit on banks' FX positions on the spot market. In the case of Africa, the most frequently used instrument are restrictions on foreign-denominated currency lending.

The level of interconnectedness as a source of financial instability and banking sector vulnerability is an important concern to developed countries and Asian supervisors. Figure 7 report the percentage of supervisors that monitor interconnectedness among banks and non-banks intermediaries (e.g., hedge funds, money market mutual funds, or generally shadow banks). All G7 countries focus on this issue, as well as the great majority of supervisors in Asia (90%). The monitoring of interconnectedness decreases significantly for Africa (50%) and for Latin America and the Caribbean (40%).

This is worrisome in the case of Latin America and the Caribbean as it is a region characterized by a growing banking concentration, a large presence of foreign banks, and an importance of financial conglomerates.

Latin America and the Caribbean is the only region in the developing world where the levels of concentration increased between 1996 and 2017. The assets of three largest banks as a share of assets of all commercial banks increased from an average of 63.8% to 70.3% between 1996-2000 to 2010-2017 Bank concentration has been accompanied by a growing presence of foreign banks in the region, which account for a large share of the assets of the commercial banking system. They own more than 50% of total bank assets in the cases El Salvador (100%), Uruguay (92%), Mexico (70%), Honduras (53%), Paraguay (51%), Peru (51%), and between 25% and 33% of total assets for Costa Rica (26%), Guatemala (30%) and Chile (33%). That makes the banking system highly vulnerable to changes in the global financial cycle. [32]

Not only has the financial sector become more concentrated, but it has also acquired growing importance in the economy in terms of power and control over both the real sector and activities that are unrelated to intermediation. Over time, the financial sector has diversified to include activities such as insurance, capital markets, and pension funds. In some countries, banks, and particularly the most important banks, operate as a part of larger financial conglomerates. A financial conglomerate is defined as "any group of companies under common control or dominant influence, including any financial holding company, which conducts material financial activities in at least two of the regulated banking areas, securities, insurance (or pensions)" (BIS, 2012). Note that a financial conglomerate, besides conducting activities in securities, insurance, or pensions, can also be involved in activities within the real sector. Financial conglomerates participate in a range of diverse activities including agriculture, commerce, energy, manufacturing, mining, retail, and telecommunications. [33]

[32] See Pérez Caldentey and Vernengo (2021).

[33] Chile, one of the most financially open and liberalized economies in Latin America and the Caribbean, exemplifies this trend. In Chile, the existence of financial conglomerates has important implications for the way banks operate in practice. By law, banks are not allowed to engage in activities that are not directly related to financial intermediation (LGB, Art. 69). However, because by far the majority of banks belong to financial conglomerates and operate as part of the limitations on bank activities are of a more formal nature. As put by the OECD: "Banks…operate as part of larger conglomerates, where the bank itself is controlled by a holding company, which also controls a host of other group companies, which may include securities, firms, insurance companies and/or fund and pension managers. The bank itself can, however, own a brokerage company, which in turn cross-sells the products of the other group companies. In many cases it appears that that the separation of the various activities is more of a formal than a functional nature" (OECD, 2011: 21). See Pérez Caldentey and Vernengo (2021).

The next sections present evidence on the use of macroprudential policies for fifteen countries located in three developing regions: Africa (Ethiopia, Ghana, Kenya, Nigeria, South Africa and Zambia), Asia-Pacific (India, Indonesia, Malaysia and Thailand) and Latin America (Brazil, Chile, Colombia, Mexico and Peru)[34]. Each of the sections includes the context and background explaining the rationale and use of macroprudential policies and the lessons learned. The sections also include, when applicable, the use of macroprudential policies under Covid-19. The evidence for most of the country case studies presented spans from the early 2000s to the latest adoption of macroprudential policies available.

5. An analysis of macroprudential measures in the Asia-Pacific region

5.1 Context/background and brief description of macroprudential policies

The countries of developing Asia are among the most globally integrated in the world, in both trade and capital markets, and therefore it is only to be expected that they have been particularly affected by changes in the global economy. For several of them, these have sharpened and amplified vulnerabilities that had already built up over the previous decade, as a result of specific policies of liberalisation that were undertaken over the past three decades.

The Covid-19 crisis is exposing the extent to which they have become more susceptible to volatile capital movements, in particular. In this context, it is important to examine the types of strategies they have adopt to protect themselves and manage the domestic impact of such volatility. As most of the Asian region moved from relying heavily on administrative controls on financial account transactions to a more liberalised approach, macroprudential measures have taken on greater significance. Given the likely volatility of the immediate future and the development challenges of the medium term, it is likely that such measures may become even more relevant.

The analysis focuses on four Asian economies: India, Indonesia, Malaysia and Thailand. These countries have been selected because they have a significant external integration with respect to both trade and finance and have all moved in the past three decades from administrative controls on capital flows and internal financial activities to more market-based measures in both.[35] Furthermore, while they have been

[34] Sections 4 to 6 are based on the papers elaborated by Jayati Gosh (Asia), C.P. Chandrasekhar (Asia), Pablo Bortz and Matías Vernengo (Latin America) that are part of the Project COVID-19 Response and Recovery Mobilising financial resources led by the Debt and Development Finance Branch, Division on Globalization and Development Strategies (DDFB/DGDS) of UNCTAD.

[35] For the case of Thailand see Jongwanich & Archanum (2012).

affected to varying degrees by the ongoing pandemic, they are still impacted by it, unlike some countries in the region (such as China and Vietnam) that appear to have protected themselves from the worst impacts and achieved some recovery. A comprehensive list of all macroprudential measures undertaken in these economies over this period is not sought to be provided.[36] Rather, the idea is to consider certain goals of such policies and specific policies and episodes with regard to the degree to which they were able to meet these goals.

The four countries here have experienced divergent patterns with respect to net capital inflows, which in turn has implications for the types of policy intervention required. The previous section showed that all four countries have had very high rates of gross capital inflow, which increased over the 2010 decade as the globally footloose capital that benefited from the monetary expansions and low interest rates of the advanced economies sought other pastures with higher returns. This was associated in all these countries with high and increasing losses resulting from differing rates of return of foreign assets and liabilities. Crucially, however, only two of these countries were recipients of significant net capital inflows over some of this period: India from 2007 and Indonesia after 2011. By contrast, Malaysia and Thailand (both countries running current account surpluses) received high gross inflows but also recorded very large outflows as they were sometimes even net capital exporters.

Further, these annual figures do not capture the dramatic volatility evident from quarterly or monthly indicators, which were particularly marked in certain periods, such as in October-December 2008 after the collapse of Lehmann Brothers and the taper tantrum in the middle months of 2013. Individual economies also faced sharp volatility in certain periods because of changing investor perceptions resulting from domestic economic processes and policies. These differences across countries should be borne in mind when considering some macroprudential measures that have been adopted in response to specific challenges.

The section does not consider macroprudential measures designed to contain internal financial risks, such as limiting credit supply (by imposing lending rate ceilings, leverage caps, reserve requirements, credit growth limits, exposure limits, levy on noncore liabilities and sectoral limits) and/or regulating demand for credit through the loan-to-value ratios, debt-service-to-income ratios and tax policies and incentives. Rather, the focus is on risks coming from financial integration with global markets and attempts to mitigate or reduce such risks through various measures. These have become particularly important in past decades as so many emerging market economies in Asia are affected by global economic forces due to greater financial liberalisation since the 1990s.

The analysis of country experiences is focussed on the measures for dealing with risks and threats arising from cross-border flows, specifically capital flow volatility, exchange rate volatility and external debt vulnerability. In the context of deregulated capital flows, all of these countries variously applied different

[36] The study considers macroprudential measures described in the IMF AREAER database as well as the more recent IMF Integrated Macroprudential Policy (iMaPP) Database, described in Alam et al (2019).

macroprudential measures, mostly driven by the understanding that foreign currency loans expose unhedged borrowers to foreign exchange risks, and capital flows can additionally create undesired exchange rate pressures in both directions. Broadly, these included the following sets of measures:

- Limits on foreign exchange (forex) positions, such as limits on net or gross open forex positions, limits on forex exposures and funding, and currency mismatch regulations.
- Reserve requirements (in both domestic and foreign currency) for macroprudential purposes, differentiated by currency.
- Measures to mitigate risks from global and domestic systemically important financial institutions (SIFIs), including capital and liquidity surcharges.

5.2 Some specific examples

The specific cases analysed include the attempt to prevent unwarranted currency appreciation in the case of Thailand, dealing with speculative activity in the derivatives market in Indonesia, the controlling liberalization in the case of Malaysia, the use of incentives to manage capital flows in the case of India and the use of loan to value ratios to direct credit in India, Indonesia, and Malaysia.

In the case of Thailand, the central bank responded to the appreciation of the Baht in 2006-2008 and 2010 by implementing different measures, including open market operations to stabilise the external value of the baht, enabling more capital outflows, as well as trying to curb some more speculative inflows of "hot money" or carry trade trying to benefit from interest rate differentials. In so far as the exchange rate affects the balance sheet positions of economic agents, this can be considered a macro prudential policy. These measures included limits on the daily outstanding baht balances of non-residents, prohibiting transactions involving baht lending or selling to non-residents without evidence of underlying trade or investment and imposing holding periods of at least three months.

In 2001, the central bank (bank Indonesia, or BI) prohibited rupiah transfers by Indonesian banks to non-residents, and emphasised that any transfers that were not supported by underlying real transactions within the Indonesian economy would not be not allowed. In addition, restrictions were imposed on derivatives transactions not supported by underlying real transactions, and the maximum limit for derivatives transactions involving forex sales by domestic banks to non-residents was reduced from USD 5 million to USD 3 million. The attempt was to limit speculation in the rupiah through these routes.[37]

In 2004, during a period of sudden increase in inflows of both external commercial credit and direct investment, the BI introduced new prudential regulations on net open foreign exchange positions of commercial banks, which restricted their ability to speculate in the swap market (Sengupta and Sengupta

[37] Derivative contracts are an important element ot understand the Asian Financial Crisis. See Kregel (1998).

2015). In addition, bank deposit accounts in rupiah and forex were subjected to higher reserve requirements and in early 2005, short-term borrowings by banks were limited to 20 percent of bank capital. Nevertheless, there was a sudden capital outflow in mid-2005, which indicated that these regulations had not been sufficient to prevent volatility and forex shortage. As a result, further measures were imposed from mid-July 2005 (Titiheruw and Atje 2008). Forex derivative transactions against the rupiah were limited to $1 million and there was a similar ceiling on dollar purchases for forward transactions and swaps. A 3-month minimum investment hedging period was imposed for forex transactions. This had an immediate impact: the volume of swap transactions fell to half in the second half of 2005 compared to the first half. However, this still proved insufficient to stem the outward flow of capital, necessitating further measures were in August. The statutory reserve requirements of banks were increased; derivative and hedging swap transactions were further regulated; and banks foreign exchange exposure was limited by setting a limit of 20 per cent on both the balance sheet net Open Position and the overall Net Open Position. Participation in the Bilateral Swap Arrangement (arising out of the Chiang Mai Initiative of 2000) was also increased.

After the formal adoption of an "inflation targeting" monetary policy regime in 2009, the BI had allowed commercial banks to freely set their exchange rates and commissions for transactions with their clients, although transactions above a defined threshold were subject to verification of supporting documents. Non-banks (mainly money changers) were authorised to conduct money exchange activities by purchasing and selling foreign currencies (banknotes) and purchase traveller's cheques but prohibited from conducting fund transfers or money remittances. However, all forex transactions had to be settled in full. In January 2011, BI revoked the facility that provided foreign exchange liquidity to domestic companies by conducting spot transactions through commercial banks in connection with economic activities in Indonesia. However, the downward slide in the rupiah continued, and was accentuated during the "taper tantrum" of 2013, when the rupiah-dollar rate depreciated by nearly a quarter of its value between the second and fourth quarters of 2013. In late 2015, the threshold amount to provide underlying transaction for foreign exchange spot purchase, which was earlier US $100,000, was increased to US$25,000 equivalent a month. All forward transactions were required to be supported by underlying documents.

Limits were imposed on net open positions of banks, and there was also a maximum limit on short term offshore borrowing by banks, of 25 per cent of their capital. Banks seeking offshore borrowing with maturity beyond one year must seek clearance from Bank Indonesia. Since much of the concern on extremely comes from non-financial corporates, in 2014 Bank Indonesia issued a new rule requiring them to have (i) a currency hedging ratio of a minimum 25 per cent of their net external debt due within three and six months; (ii) a liquidity ratio (including the current foreign assets in the hedging ratio) of a minimum 50 per cent of their net external debt due within three and six months; and (iii) a minimum credit rating of one notch below investment grade (Warjiyo 2021).

In Malaysia domestic financial institutions were asked to maintain countercyclical capital buffers to reduce their vulnerabilities to global instabilities and crises. While these measures probably reduced extreme movements in these asset markets to some extent, they were not successful in addressing the more

fundamental problem of net capital outflows that were enabled by the liberalisation measures of the previous decade.

5.3 The lessons learned

The global inability to rein in finance even in the context of a unprecedented pandemic has had unfortunate consequences for developing countries. These consequences extend even to emerging markets that do not currently face problems like unpayable external debt and continue to receive significant capital inflows. These Asian countries considered here are clear examples of the constraints posed by unrestricted capital flows on domestic economic and financial stability and possibilities for economic recovery.

In countries that are unconstrained by sovereign debt concerns and IMF conditionalities, the potential for capital flight plays a major role in limiting aggressive fiscal measures for economic recovery. Asian emerging markets are now so integrated into global capital markets that they are effectively total dependent on the whims of global investors (who in turn are affected by monetary and fiscal policies in advanced economies) and face massive changes in the volume of capital entering and exiting the country. There was a major capital flight from emerging markets, including in Asia, in March 2020, but thereafter a recovery and a renewed surge from late 2020 onwards. Now the likelihood of significant expansion in the United States and possible monetary tightening in the near future could well lead to another major outflow. In addition, there are further concerns that are likely to become even more evident during the ongoing global pandemic-induced crisis. De Bock et al (2020) have used a capital-flows-at-risk methodology to show that changes in global financial conditions tend to influence portfolio flows more during surges and reversals than in normal times. Unfortunately, stronger domestic "fundamentals" only help to mitigate outflows. This means that it is likely that the weaker growth outlook for emerging markets due to Covid-19 will decrease the demand for domestic currency denominated assets, while global financial conditions and a stronger and faster recovery in advanced economies will increase the demand for assets denominated in hard currency.

It is evident from this brief consideration of macroprudential measures in several Asian emerging markets that, while they are certainly necessary, they are generally inadequate to deal with this most significant problem. There is no doubt that an approach that uses various macroprudential instruments that take into account possible and systemic risks is superior to the standard inflation-targeting approach that was commonly used by central banks across the world. But preventing extreme crises and trying to reduce instability, volatility and foreign exchange risks are not the only tasks of central banks or of monetary and financial policies more generally. Especially in developing countries, much more is required—most of all, in ensuring the availability of finance to support development, to assist fiscal policy in dealing with economic shocks and cycles and to deal with and mitigate climate change.

Essentially, macroprudential measures cannot resolve the contradictions created by open financial accounts in EMEs. They can reduce systemic fragility in the financial sector in certain contexts, and possibly prevent the build-up of speculative bubbles in sectors like real estate for some periods. But even

these impacts are limited, as discussed below. In addition, they cannot provide a route out of the need for excessive and overly expensive self-insurance in the form of accumulation of forex reserves; cannot prevent significant losses to the economy because of differential rates on return on external assets and liabilities [38]; cannot ensure that gross inflows translate into net inflows of capital; cannot ensure that net inflows translate into increased domestic investment; cannot enable domestic investment in desired sectors; and cannot reduce the fear of financial market response that limits governments' ability to undertake adequate fiscal measures for economic recovery even in periods of crisis-induced downswings. In addition, in periods of severe crisis, they are at best reactive in terms of mitigating damage in domestic financial markets, and often unable to prevent this either. All these outcomes have become even more starkly evident in the period of the Covid-19 pandemic. As a result, they are relatively poor substitutes for more direct controls on the ownership of domestic and foreign financial assets and regulations governing the nature and extent of capital flows in developing countries. [39]

There are several reasons for this. To begin with, private players in financial markets can typically evolve new strategies to circumvent particular regulations or use other instruments and different financial products that have slipped through the regulatory framework. Since emerging markets now have fairly complex financial systems, with various kinds of resident and non-resident holders of different financial assets, regulations become even more complicated. Many non-bank financial institutions are now active agents involved in cross-border capital flows but can bypass the regulations imposed on banks. Meanwhile, governments continue to feel constrained by the possibility of capital flight and potential downgrades by global credit rating agencies and curtail their own spending despite domestic economic collapse and the urgent needs of their own people. This is why it has been argued by Erten, Korinek and Ocampo (2020) that it is of "the utmost importance that developing and emerging economies have access to capital controls as part of the toolkit of policy measures at their disposal to lean against the externalities generated by international capital flows, both to maintain financial stability and to allow full policy space for aggregate demand management." [40]

In such a context, it is imperative for Asian developing countries to draw on their past experience to develop new forms of macroprudential measures that are more appropriate to the contemporary situation, which would enable them to preserve some degree of financial stability, reduce their financial vulnerability, and enable domestic policies for recovery of output and employment. This need is even more pressing because of the emerging challenges posed by climate change and the inevitable requirement for massive public expenditures for mitigation and adaptation. Therefore, in the absence of

[38] Holding of reserves is extremely expensive, because these reserves are typically held in low-yielding assets and safe securities like US Treasury Bills, which have provided very low and decreasing rates of interest. This adds further to the more general problem of "sizeable wealth transfers between emerging and advanced economies. They have also resulted in significant income transfers in view of negative yield differentials between their gross external assets and liabilities." (Akyuz 2017, 2021).

[39] See ECLAC (2021) A policy-oriented study on capital flow regulations. Response and Recovery: Mobilising financial resources for development in the time of COVID-19. Project Paper 10.21.

[40] See Fernández et al. (2016) for a data set on capital controls.

global institutions to rein in capital, it is essential for governments in emerging market economies to take a more direct, hands-on approach to managing capital flows and limiting any possible damaging or constraining effects on economic policy and domestic financial stability. Governments across the region need to take a more clear-headed look at the past experience as well as current conditions to assess the strategies that have actually worked in the past and bring about the necessary reforms in ownership patterns and regulatory structures for financial markets.

6. The experience in Africa with macroprudential measures

6.1 Context/background and brief description of macroprudential policies

This section is concerned with the kind of macroprudential measures adopted by African countries to address systemic fragility resulting from the external instability that follows increased global integration. Macroprudential measures gained currency after the global financial crisis of 2008 as a form of regulatory intervention aimed at pre-empting the accumulation of excessive systemic risks that disrupt the financial system and damage the real economy (Agenor 2016). The Covid-19 pandemic heightened systemic risks in Africa, by aggravating pre-existing vulnerabilities. Since many of these vulnerabilities existed prior to the pandemic, it is to be expected that governments and regulators had put in place measures that were aimed at mitigating such risks. Among such measures are those called "macroprudential" aimed specifically at limiting the build-up of systemic risks resulting from external exposures or ensuring resilience in the face of external shocks. This section aims to identify the macroprudential measures adopted in the period 2000-2020 in selected sub-Saharan African countries (Ethiopia, Ghana, Kenya, Nigeria, South Africa, and Zambia) and assessing, to the extent possible given the short-time period, their efficacy at the time of the Covid pandemic.

Most sub-Saharan economies are dependent on primary commodities for their export earnings, with a lucky few having access to oil and gas reserves and precious metals, especially gold. UNCTAD's 2019 report on the *State of Commodity Dependence* found that nine out of ten sub-Saharan African countries are commodity-dependent, "compared to two thirds of the countries in the Middle East and North Africa, half of the countries in Latin America and the Caribbean, and half of the countries in East Asia and the Pacific." A country is identified as commodity-dependent if commodities account for more than 60 per cent of the value of its total merchandise exports in value terms. Of the countries selected for study, South Africa is the only one that does not fall in this category.[41]

Moreover, the degree of diversification of the commodity export basket and export destinations is low. Ethiopia and Kenya are dependent primarily on agricultural exports. Coffee (28.7%), oilseeds (14.5%), khat (Catha edulis, a psychoactive stimulant) (11.4%), pulses (10.2%) and cut flowers (9.6%) are Ethiopia's major export products and tea, cut flowers and foliage and coffee, Kenya's. Ghana and Zambia on exports

[41] See Gelb and Black (2004)

of minerals, ores and metals and Nigeria on fuel exports. [42]

With this overwhelming dependence on exports of a few primary products with volatile demand and international prices, the trade and current account of the balance of payments in these countries are routes through which shocks could be transmitted to the domestic economy, triggering systemic difficulties.

Commodity dependence is invariably associated with substantial and sustained dependence on capital flows. During periods of both commodity price declines and increases, there is singular tendency for increased dependence of foreign capital. When prices are rising, and the capacity for servicing foreign liabilities improves, many countries rely on foreign borrowing or foreign direct investment to develop their commodity exporting sectors, resulting in outflows of foreign exchange to finance primary income payments, such as debt service (interest payments and amortisation) , technical fees, royalties, profits, and dividend repatriation. So even if the trade account is relatively resilient, the current account deficit can be large because of outflows of these payments. When commodity prices decline, the current account weakens, encouraging countries to borrow abroad to finance their import bill and sustain economic activity. As a result, commodity dependence intensifies balance of payments vulnerability.

Given their structural external vulnerability and the possibility of adverse systemic effects, most African countries have adopted different measures to regulate capital inflows. These measures include capital flow management, exchange rate management and addressing risk transmission. [43]

6.2 Specific examples under COVID-19

The COVID-19 Pandemic aggravated African countries external vulnerabilities and led to significant exchange rate depreciations and debt stress particularly in the cases of Ghana (48% of its debt matured in 2020 and needed refinancing)[44], Kenya (the IMF's raised the country's risk of debt distress from moderate to high), and Zambia (Zambia became the first defaulter on external debt after the onset of the pandemic).[45] Most governments turned to the IMF for emergency finance and several became part of the G-20 Debt Suspension Initiative (DSSI) and rarely introduced macroprudential regulations to combat the external impact of the Pandemic. This is exemplified by the cases of Ethiopia, Ghana, and Kenya. [46]

With capital inflows adversely affected, Ethiopia was left with a foreign exchange funding gap, which required approaching the IMF for support under the Rapid Financing Instrument and requesting grant assistance under the Catastrophe Containment (CC) window of the Catastrophe Containment and Relief Trust (CCRT). Given the foreign exchange crunch, the Ethiopian authorities, having been prudent with respect to capital flows earlier, chose to relax rules relating to foreign borrowing. As of August 2020,

[42] Asante-Poku et al. (2012)
[43] See ECLAC (2021) A policy-oriented study on capital flow regulations. Response and Recovery: Mobilising financial resources for development in the time of COVID-19. Project Paper 10.21. See Siwale (2021) for an analysis of the impact of COVID-10 on Zambia.
[44] See, Taylor and Sarpong 2020; Bank of Ghana (2021)
[45] See, Siwali (2021)
[46] Thirty-five African states joined the DSSI including Ethiopia, Ghana and Kenya.

commercial banks were allowed to engage in foreign currency intermediation through borrowing from international financial institutions in US dollars, Canadian dollars, pound sterling, euro, Chinese yuan and Japanese yen. Banks were also allowed to grant credit to local borrowers in foreign currency. Commercial banks could thus lend locally in foreign exchange. Banks that decide to engage in foreign-currency intermediation must open a foreign-currency reserve account with the national bank of Ethiopia and maintain 5% of the outstanding balance of the external loan in foreign currency (EIU, 2020). Rather than act to reverse debt dependence, the government increased that dependence.

Ethiopian banks can borrow foreign currency from international financial institutions in US dollars, Canadian dollars, pound sterling, euro, Chinese yuan and Japanese yen. The directive also allows banks to act as intermediaries for local borrowers. Ethiopia has been facing a foreign-currency shortage for years, and this move by the NBE should ease these pressures. The government was quick to identify foreign-exchange shortages as a bottleneck to economic development, and has been committed to opening up the financial sector to allow more investments in the country.

Ghana initially opted to postpone debt servicing by applying to participate in the G20's DSSI, which, however, does not cover private and even multilateral creditors. In 2020, 59 per cent of Ghana's total debt service payments were owed to private creditors. Identified as being in debt distress by the join IMF-World Bank Debt Sustainability Framework for Low Income Countries, the country had no option other than turning to the IMF. It did so early, obtaining IMF approval on April 13, 2020, for the disbursement of SDR 738 million (about US$1 billion) to be drawn under the Rapid Credit Facility (RCF).

Kenya also asked IMF for support. In May 2020, the IMF provided $739 million in the form of an interest-free loan under the RCF to help Kenya cover the cost of additional spending on health and social protection. Subsequently, Kenya agreed to a new programme with the IMF to garner low-cost loans to the tune of $2.4 billion over three years under the Extended Fund Facility (EFF) and Extended Credit Facility (ECF).

Nigeria was the exception as the central bank opted to apply exchange controls in June 2020 to defend the parity of the currency as it faced foreign exchange constraint resulting from the Covid-19 crisis and the fall in oil prices. It stepped up administrative controls by increasing the number of goods under import restrictions, enforced existing requirements for export repatriation and reduced the foreign exchange supply to various windows.[47]

6.3 The lessons learned

The experience of commodity dependent sub-Saharan Africa points to how current account movements resulting from the volatility in the volume and unit value of exports can contribute to financial account and overall balance of payments vulnerability, precipitating currency and even systemic crisis. The link between the current and financial account is visible not merely in periods

[47] As explained by the authorities (IMF, 2020): ''Nigeria maintains the following exchange restrictions: (i) an exchange restriction arising from the prohibition to access foreign exchange at the Nigerian foreign exchange markets for the payment of imports of 42 categories of items;1 (ii) an exchange restriction arising from the rationing of foreign exchange by the CBN in different FX windows, and its allocation based on the CBN's determination of priority categories of transactions; and (iii) an exchange restriction arising from existing limits on the amounts of foreign exchange available when traveling abroad (BTA/PTAs), which cannot be exceeded even upon verification of the bona fide nature of the transaction.''

when falling export revenues due to reduced exports and decline in export prices makes the economy more dependent on capital inflows to finance current account deficits. Rather, even when exports are doing well, the confidence that this generates encourages relying on capital inflows to raise investment and growth, in the belief that the associated commitments can be easily financed with export earnings. The ubiquitous presence of this asymmetric reliance on enhanced inflows during periods of both increased and reduced current account financing needs in almost all countries studied (except South Africa, which is not commodity dependent), points to the need for countercyclical measures to address external vulnerability.

During periods of buoyancy in exports, countries need to be (i) cautious about excessive external borrowing and increased capital account liberalisation that lead to substantially enhanced external liabilities; and (ii) must set aside 'surplus' in foreign exchange in institutions and instruments that can be deployed to deal with the vulnerability that manifests when commodity demand and commodity prices are subdued or falling. As discussed above, some countries have established sovereign wealth funds as the means to undertake such countercyclical intervention with salutary effects. But this has not gone far enough and has been accompanied by overreliance on the easier options of foreign borrowing, facilitation of foreign portfolio investment and excessive foreign direct investments.

To the extent that countercyclical measures are not adequate to cover foreign exchange needs when faced with external shocks, sole reliance on borrowing and capital flows tends to exacerbate vulnerability hugely. Short term macroprudential measures to deal with this -, varying from policies that commandeer available foreign exchange flows to shore up reserves (through enforced early repatriation of export receipts, for example) or measures to access external liquidity, like foreign currency swaps with friendly trading partners -, may be inadequate. In that event, reliance only on capital flows results in the cumulative build-up of external liabilities and exacerbates longer-term vulnerabilities. Measures to directly address the imbalance in the current account including curbs on non-essential imports need to be considered to tide over difficult times. In practice, given commitment to liberalised trade rules and external pressures, countries resort to such measures only when the crisis intensifies, and default seems inevitable.

Current account vulnerability also requires intervention to manage the exchange rate to prevent transmission of shocks across the system. For example, a sharp depreciation of the domestic currency in a context of large foreign currency corporate debts, can trigger bankruptcies because of a spike in the domestic currency value of debt service commitments and adversely affect the financial institutions exposed to these corporates. But managing the currency is a difficult exercise, since commodity export dependence implies that the real exchange rate must be stabilised to protect export competitiveness. Thus, given relative inflation rates, currency market intervention on macroprudential grounds must not just guard against precipitate depreciation, but ensure nominal depreciation at a rate that keeps the real exchange rate within a competitive range. That can be a challenge, as the experience of Africa illustrates.

In sum, macroprudential measures are crucial in addressing external vulnerability and pre-empting shocks that can prove systemic, especially given the difficulties in reversing liberalisation measures that trigger tendencies that increase vulnerabilities. But where features like commodity export dependence and inequities in trade and access to international liquidity result in exceptional vulnerability, the policy space to turn to structural measures such as capital controls and even controls on trade may be needed.

7. The Latin American experience

7.1 Context/background and brief description of macroprudential policies

This section reviews the experience of five Latin American economies (Brazil, Chile, Colombia, Mexico, and Peru) with macroprudential policies (MPPs) in the 2000s.[48]

These countries experienced similar developments in their balance-of-payments during this millennium, being net recipients of surges of capital inflows before and after the global financial crisis (GFC) in 2008, and a fall in inflows after 2014. Throughout these years, and particularly after the GFC, all had current account deficits and negative Net International Investment Positions (NIIP). All of them witnessed episodes of accelerated credit growth, but rarely saw episodes of banking or financial crisis. Their financial system weathered the 2008 crisis with relative resilience, aided by the policies implemented by monetary and banking authorities. Many of them adopted most of the measures that comprise Basel III regulatory standards, while some of them had already implemented similar measures even before Basel III.

All these countries had severe crises episodes before the GFC. All of them experienced either sovereign, banking and/or currency crises in the 1980s, according to the Laeven and Valencia (2020) database. Brazil, Colombia and Mexico also experienced at least one of these types of crises in the 1990s: Brazil in 1999, Colombia in 1998 and Mexico in 1995. Peru went through a sovereign debt restructuring process in 1996, while entering the 2000s with very high levels of dollarization of its financial system.

Some of the measures obey different objectives. For instance, while some countries adopted a Leverage Ratio to comply with the Basel III framework, others (such as Chile) adopted it earlier. There is lack of evidence about the impact of some measures, either because they were recently adopted, or because they were not tested so far. For others, evidence is mixed. For instance, countercyclical reserve requirements were found to be more effective in busts (alleviating liquidity pressures) than in booms. There is opposite evidence of countercyclical loan-loss provision. Other measures based on capital controls such as unremunerated reserve requirements and taxes on non-residents were mildly successful, but had stronger effects when complemented, for instance, with taxes on derivatives.[49]

[48] Useful references include: Agenor and Pereira da Silva (2016); Ahmed and Zlate (2014); Aizenman and Lee (2007); Avdjiev et al (2014); Avdjiev et al. (2016; 2020); Barbone González et al. (2019); Blanco Barroso et al (2020); Costa de Moura y Bandeira (2017); Goldfan & Minella (2007); IMF (2018a); Jeanne and Ranciere (2011); Kaltenbrunner, A. and Painceira (2015); Oliveira et al. (2018); Pereira da Silva and Harris (2013) and Tarashev et al. (2016) for Brazil; Cifuentes et al. (2017), Gómez et al. (2020), Ministerio de Hacienda (2020), Raddatz, and Vergara (2016) for Chile; Banrep (2020); Osotio (2021); Vargas et al. (2017) for Colombia; Armas, A. (2016), Choy and Chang (2014) Minaya, E., Lupú, J. and Cabello; Rossini & Quispe (2017) for Peru. See also all the IMF country reports cited in the references section.

[49] See, Prates and Fritz (2016).

A major conclusion is that Latin American economies have successfully implemented MPPs, but new vulnerabilities arose in the last years, which present a challenge to policy makers.

In the case of Brazil, the main financial vulnerabilities arise from the exposure of the non-financial sector to external conditions, both directly (because of its scale of external borrowing) and indirectly (because of funding sources for its domestic borrowing). It can be particularly affected by sudden exchange rate volatility. The banking sector is solid, with low levels of non-performing loans reduced debt-service ratios, relatively low and stable credit to households, and low government exposure to foreign currency debt.

In Chile the major threats to financial stability arise from both the international and domestic exposure of the corporate non-financial sector, which could derail investment and growth. Another source of concern is the accelerated indebtedness of the household sector.

Colombia has reduced currency mismatch in sovereign debt, a traditional source of concern for developing countries. However, there are other worrying signs like a sustained current account deficit, increasing presence of foreign investors in local-currency debt markets, and rising larger stocks of foreign-currency corporate-issued debt securities, which are exposed to volatility in exchange rates and commodity-prices (mainly oil and coal). IMF (2020a) noted that the external financing needs of Colombia (computing the current account deficit and debt amortization needs) are particularly high for the near future, relative to regional standards. The COVID-19 pandemic has also strained the access of banking and non-banking institutions to international markets.

In the case of Mexico, already prior to the COVID-19 pandemic the government was transferring funds to state-owned companies to afford their external borrowing (Cantú et al 2021). Since these are large companies, their external indebtedness can create negative spillovers for both government finances and the domestic financial system.

Peru appears to be a more successful case in the implementation of macroprudential policies as these helped to address both structural (dollarization, systemic risk, and resilience) and cyclical (credit growth rates) external and domestic vulnerabilities of the Peruvian financial system.

7.2 Macroprudential policies during COVID-19

In what refers to its macrofinancial impact, the COVID-19 pandemic had a similar effect on the countries under analysis and elicited a similar response in terms of macroprudential policies. The shock also revealed some of the vulnerabilities presented in this survey, such as the negative conditions implied by the presence of non-resident investors in domestic debt markets.

The region faced both an external and an internal shock. There were unprecedented capital outflows, massive and sudden depreciations, and increments in sovereign spreads, aggravated by the presence of

non-resident investors (Bortz et al 2020). There were (initially) falls in commodity prices which were later reversed. On the domestic front, on top of the fall in economic activity due to lockdown restrictions, there were severe financial disturbances. These are mentioned in the Financial Stability Reports issued by each central bank, and in the Article IV Consultation Staff Reports of the IMF. The policy response was very similar across all the countries in this survey, in terms of objectives and instruments.

The Central Bank of Brazil (CBB) mentions severe disruptions in domestic financial markets, with rising margin calls, liquidity needs and credit demand (BCB 2020). The country also faced substantial capital outflows that led to major exchange rate depreciations and fall in asset prices (such as the stock exchange). In response to these disruptions, the BCB implemented different sorts of measures. On the external front, it intervened in foreign exchange markets and provided foreign exchange liquidity to bank and non-bank financial institutions (BCB 2020, 58). It should also me noticed that Brazil agreed to the establishment of a swap line with the Federal Reserve that eventually diminished the pressure on its exchange rate (Aguilar and Cantú 2020). On the domestic front, the BCB implemented an asset purchase program, reduced reserve requirements and mandatory Liquidity Coverage Ratios (LCRs), instrumented a Special Temporary Liquidity Facility, diminished the required Capital Conservation Buffers (CCBs), reduced risk-weight factors for Small and Medium Sized Firm lending, eased norms regarding dates of borrowers' obligation payments and suspended dividend payouts and share buybacks.

In the case of Chile, it faced the largest capital outflow ever recorded (BCCh 2020, 17). It observed a spike in local lending rates at the beginning of the pandemic, and distortions in domestic liquidity, as other countries. To boost foreign exchange resources, the country obtained a Flexible Credit Line (FCL) with the IMF.[50] To counteract foreign exchange volatility, the Central Bank of Chile (CBC) implemented sales of US dollars, foreign exchange swaps and repos (BCCh 2020). It provided liquidity lines in USD and Chilean peso, extending the maturity of the programmes, and temporarily suspended maturity mismatch requirements. It also relaxed LCRs, adjusted regulation on provisions to help struggling debtors, and implemented new liquidity lines to support lending.

On top of the external shock faced by many countries in the region, Colombia's external profile was particularly affected by the fall in oil prices and by the sovereign credit rating downgrading. The

[50] The FCL is designed a funding facility for crisis prevention. It does not have a quota limit and is accessed and renewed on a case-by-case basis. It provides funding at interest rates below market rate (interest rate corresponding to SDRs plus a margin (100 basis points) and is renewable after one or two years. While is does not entail 'on going condition' because it does not need to. It is granted to economies that have the following qualifications: A sustainable external position; a capital account position dominated by private flows; a track record of steady sovereign access to international capital markets at favorable terms; a comfortable reserve position; sound public finances, including a sustainable public debt position; low and stable inflation, in the context of a sound monetary and exchange rate policy framework; a sound financial system and the absence of solvency problems that may threaten systemic stability and effective financial sector supervision (IMF, 2022). The FLC assumes that countries remain committed to these objectives. As a result of these stringent access conditions only four countries in Latin America and the Caribbean have been able to access the FLC, Chile, Colombia, Mexico, Peru. While only Colombia has used its FCL, the mere fact of having it available increase the confidence of foreign investors.

government extended its FCL with the IMF. The central bank intervened in the forward foreign exchange market and auctioned foreign exchange swaps. It also reduced reserve requirements, implemented asset purchases programmes, and eased collateral frameworks. The Financial Superintendence, in turn, eased conditions on borrowers to protect their credit ratings during the pandemic.

Mexico followed a similar approach regarding the macroprudential response. The central bank of Mexico implemented liquidity lines, reduced reserve requirements, extended the collateral framework, expanded dollar liquidity lines and derivatives supply, and implemented credit lines to banks to maintain a proper flow of credit to the private sector, meeting increased demand. It eased LCR and CCB requirements, and deferred credit payments.

Finally, Peru implemented policies and reached agreements with international institutions to increased foreign exchange supply and hedging. The Peruvian central bank participated in a dollar liquidity facility of the Federal Reserve, while the country obtained a FCL from the IMF. The central bank reduced reserve requirements, extended liquidity facilities, eased provision requirements, and implemented asset purchase programmes.

7.3 Lessons learned

The experience of Latin America with macroprudential regulation point to the following policy lessons.[51]

First, Latin American adopted a macroprudential approach to financial regulation even before the current global trend. This approach is particularly identifiable in the measures taken to contain foreign exchange vulnerability. It also obeys to specific and idiosyncratic characteristics of the surveyed economies, such as the presence of foreign banks and the degree of interconnectedness within the banking sector and between financial sectors.

Second, the case of Peru is clearly remarkable, because it succeeded in diminishing the degree of dollarization of deposits and credits by pressuring banks to adopt macroprudential measures (among other measures, and together with macroeconomic stability).

Third the Basel III approach, therefore, had and still has to be complemented with more focus on external vulnerabilities in all countries, which are not thoroughly addressed in the global macroprudential framework.

Fourth, the newly vulnerabilities are not concentrated on banks, which are tightly regulated, but on borrowers, related particularly to external borrowing by the corporate non-financial sector. There are examples within the region that include capital control measures such as limits, taxes and reserve requirements on external borrowing, hat provide illustrations about ways to approach these new

[51] See Gambacorta and Murcia (2020) for an analysis of the impact of macroprudential policies on Latin American economies.See also, Jacome et al. (2012); Ruiz et al. (2014); and Tovar (2012).

vulnerabilities. However, the current policy perspective seems to follow a different [52]approach, favouring for instance privately issued hedge instruments (local bonds. See, BIS, 2012 for a description of some of these instruments).

Finally, the fact that some measures have different impact on booms and on busts calls for an integrated, comprehensive, and holistic approach to macroprudential regulation, going beyond Tinbergen's Rule (Tinbergen 1952) and adopt multiple instruments to multiple objectives.

8. Conclusion

Macroprudential regulation is not a well-defined concept and, at the same time, is of limited applicability especially to deal with the problematic of developing countries, including those of Latin America and the Caribbean.

Macroprudential regulation has the objective of addressing systemic risk to promote financial stability. Yet there is no consensus on the definition of financial stability. Also, survey evidence indicates that regulators do not consider macroprudential regulation as a priority and tend to rely on capital adequacy ratios (that is on micro prudential regulation).

Within the dominant economic thinking paradigm (Shin 2010), macroprudential regulation can only be justified as a policy to improve the intermediation function of the banking system between savings and investment. According to this view the main source of financial instability and systemic risk is the banking system. Macroprudential regulation does not recognize that financial instability can originate from the non-financial corporate sector and can be endogenous to the functioning of a private market economy. For developing economies, and, particularly for Latin American economies the accumulation of debt by the non-financial corporate sector is an important source of financial vulnerability which is compounded by the fact that the non-financial corporate sector tends to operate with currency mismatches and these currency mismatches have increased since 2007.

At the more general level this view fails to recognize that systemic risk for developing economies is the result of their increased financial openness and their greater reliance on price mechanisms as the way to produce and allocate resources. In conjunction with the changes that have occurred in the international financial system which include among other the strengthening of the international bond market as the main source of finance for developing economies and increased financialization of productive activities, this has led to a combination of greater dependency on short-term capital flows and increased debt accumulation. In some cases macroprudential regulation that has loosened credit conditions has strengthened debt accumulation.

This pattern of economic integration has narrowed the policy space of developing country governments.

[52] This states that the number of achievable policy goals cannot exceed the number of policy instruments.

This was exemplified by the impact of Covid-19 which increased the public debt of developing countries and has left some countries with little choice but to contract government expenditures when they are most needed to spur a sustained recovery. Greater dependency on short-term flows and debt accumulation has also been detrimental to long-term economic growth. In fact, at least the experience for Latin America shows, that increased debt accumulation has been accompanied by a decline in the rate of growth in the formation of gross fixed capital.

Macroprudential regulation for developing economies should have two interrelated objectives. These consists in minimizing the impact of external fluctuations on the domestic economy while providing policy space to foster growth and full employment.

9. Annex 1: A macroprudential framework

This annex shows the detailed derivation of identities (1) and (2) of section 3. Table 3 shows the components of the assets and liabilities of a representative commercial bank, referred to as bank *i*.

Table 3
Consolidated balance sheet

Assets	Liabilities
Loans to end-users $(\boldsymbol{P_i})$ ✓ Households ✓ Business ✓ Government	**Debt** $(\boldsymbol{D_i})$ ✓ Non-bank agents/institutions ✓ Banks
Intermediary loans $(\boldsymbol{P_{ij}})$ Interbank loans	**Capital/Equity** $(\boldsymbol{E_i})$

Source: On the basis of H. Shin (2010).

The assets side includes loans to end-users, which include households, businesses and government (P_i). Secondly, it includes loan from bank *i* to other financial institutions (for example, P_{ij} where *j* refers to other financial institutions). The latter are also equal to the value of the liabilities of bank *j* held by bank *i* (D_{ji}) and the share of the liabilities of bank *j* in the total liabilities of other financial institutions held by bank *j* (π_{ji}).

The liabilities side includes debt held by bank *i* from other banking and non-banking institutions (D_i) and also capital/equity (E_i).

By definition, assets are equal to liabilities; in other words, loans to end-users plus claims on other financial institutions are equal to the sum of debt and equity. In other words:

$$(1) Assets = Liabilities \Leftrightarrow P_i + P_{ij} = D_i + E_i \Leftrightarrow P_i + D_{ji}\pi_{ji} = D_i + E_i$$

where, $D_{ji}\pi_{ji} = P_{ij}$

Expressing loans P_i in terms of the other components of identity (1) gives:

$$(2)\ P_i = D_i - D_{ji}\pi_{ji} + E_i$$

Summating (2) generalizes identity (2) to the whole financial system,

$$(3) \sum_{i=0}^{t} P_i = \sum_{i=0}^{t} D_i - \sum_{i=0}^{t} D_{ji}\pi_{ji} + \sum_{i=0}^{t} E_i \Leftrightarrow P = D(1-\Pi) + E$$

According to (3), loans from the banking system (P) are a function of debt (D), capital (E) and the funding of the banking system, whether from non-bank financial intermediaries or outside sources $(1-\Pi)$.

In turn, debt (D) can be expressed as the difference between assets and equity,

$$(4) Debt = Assets - Equity \Leftrightarrow Debt = \left(\frac{Assets}{Equity} - 1\right) * Equity$$

$$\Leftrightarrow D = \left(\frac{A}{E} - 1\right) * E$$

Where $\left(\frac{A}{E}\right)$ is leverage (λ),

Substituting (4) in (3) gives,

$$(5) P = D(1-\Pi) + E \Leftrightarrow P = (\lambda - 1) * E * (1-\Pi) + E$$

According to (5), loans from the banking system (*P*) are a function of leverage (λ), equity (*E*), the funding of the banking system either from non-bank financial intermediaries or from outside sources $(1-\Pi)$.

The latter component can be divided into non-bank funding from residents and non-bank financing from abroad. Formally,

$$(6)(1-\Pi) = (\alpha_1 + \alpha_2)(1-\Pi)$$

Where,

$\alpha_1 =$ proportion of funding from resident non-bank sources,
$\alpha_2 =$ proportion of funding from non-resident non-bank sources, and
$0 < \alpha_1, \alpha_2 < 1 \; y \; \alpha_1 + \alpha_2 = 1$

This conceptual framework makes it possible to articulate a macroprudential regulatory framework around four pillars: (i) credit growth; (ii) leverage; (iii) interconnectedness (financing external to the banking system as a whole); and (iv) equity. This is formalized in identity (7).

$$(7) \quad P = (\lambda - 1) * (1-\Pi) * E + E$$

Credit growth	Leverage	External funding of the banking system as a whole (residents and non-residents)	Equity

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