Latin American Journal of Central Banking 1 (2020) 100017

Contents lists available at ScienceDirect

Latin American Journal of Central Banking

journal homepage: www.elsevier.com/locate/latcb

Monetary policy and financial stability in emerging market economies ☆

Martin Tobal*, Lorenzo Menna

Banco de Mexico, Mexico

ARTICLE INFO

JEL classification:
E58
E44

Keywords:
Leaning against the wind
Capital flows
Financial crisis

ABSTRACT

During the 1990s and early 2000s, the consensus was that central banks had to adjust interest rates only in response to inflation and (possibly) output. Such consensus was questioned in the aftermath of the Global Financial Crisis, as well as during the present pandemic. In contrast with most of the traditional literature, some observers argued that financial crises are endogenous events, claiming that central banks also had to dampen the accumulation of financial imbalances; that is, they had to "lean against the wind." However, this debate has, for the most part, focused on advanced economies (AEs), overlooking important characteristics of emerging market economies (EMEs). Based on more recent literature, in this paper, we set the terms of the debate for EMEs. We argue that the relationship between monetary policy and financial stability is different in these economies because, unlike in AEs, the financial conditions are strongly dependent on capital flows. This characteristic of EMEs makes the trade-offs faced by their central banks more complex.

1. Introduction

During the 1990s and the early 2000s, the consensus was that central banks had to adjust the interest rate only in response to inflation and (possibly) output. Following Taylor's (1993) original formulation, this consensus was frequently stated in terms of the Taylor rule. However, the Global Financial Crisis (GFC) of 2007–2009, the slow recovery that ensued, and, finally, the present pandemic eroded that consensus, giving rise to a heated debate over the appropriate role of central banks (Smets, 2014). At the same time, in advanced economies (AEs), interest rates hit the zero-lower bound and central banks experimented with new approaches, such as quantitative easing and forward guidance, overcoming in practice the traditional framework of the Taylor rule. This evolution continues to this day, in the wake of the COVID-19 pandemic, as central banks are considering even newer approaches to monetary policy and goals that go beyond their traditional objectives (see, e.g., Board of Governors of the Federal Reserve System, 2020; European Central Bank, 2020).

The debate over the role of central banks overheated in the aftermath of the GFC, especially concerning the relationship between monetary policy and financial stability. Some observers looked at these crises as *endogenous events* that stemmed from the accumulation of financial imbalances such as excessive credit growth and abnormally high asset prices. Consistent with this idea, it was suggested that the interest rate should be used to stabilize inflation and output, but also to tackle financial stability concerns by dampening these imbalances (Borio et al., 2001; Borio and Lowe, 2002; Woodford, 2012; Adrian and Shin, 2009; Rajan, 2005). However, although of great relevance, this debate focused on AEs, overlooking the idiosyncrasies of emerging market economies (EMEs). In this paper, we

☆ The views expressed in this paper do not reflect Banco de México's opinions. We thank Óscar de Jesús Meneses Covarrubias for outstanding research assistance.

* Corresponding author.
E-mail address: martin.tobal@banxico.org.mx (M. Tobal).

https://doi.org/10.1016/j.latcb.2020.100017
Received 13 September 2020; Received in revised form 2 November 2020; Accepted 12 November 2020
Available online 14 December 2020

argue that such idiosyncrasies cause the relationship between monetary policy and financial stability to work differently in EMEs. Financial developments in these economies are heavily influenced by capital flows, which, we claim, worsens the trade-offs faced by their central banks.

Before the GFC, financial stability was viewed mainly from a microeconomic perspective. That is, the risk faced by the financial system as a whole was mostly viewed as the sum of the risks taken by individual financial institutions (Acharya, 2013; Allen and Carletti, 2013). Nonetheless, the GFC showed that these institutions interact in ways that can trigger negative externalities that amplify the risk faced by the system as a whole (i.e., systemic risk), even though they do not increase individual risk-taking (Board, 2011). These negative externalities are reflected, for instance, in a financial cycle along which systemic risk is amplified, and the boom in credit and asset prices subsequently leads to a bust (Borio et al., 2001; Borio and Lowe, 2002). [2]

In the sense that this view conceives financial crises as endogenous, it contrasts with the possibility that they are not the result of previous excessive credit growth and high asset prices; in particular, it contrasts with the possibility that financial crises stem from unexplained shifts in demand or supply that bring about defaults, higher risk premia, and lower credit. The latter is the approach traditionally taken in the macroeconomics literature that, by modeling financial crises as the result of exogenous shocks, has focused on their implications, enabling us to gain a deep understanding of them. This is, indeed, the approach taken in the earlier literature on the "financial accelerator" (Carlstrom and Fuerst, 1997; Kiyotaki and Moore, 1997; Bernanke et al., 1999; Iacoviello, 2005). This view does not aim at understanding the causes of the unexplained shifts; that is, it perceives financial crises as the result of exogenous shocks.

The view of financial crises as exogenous has relevant implications for the role of monetary policy in addressing financial stability. Absent systemic risk, central banks can, for the most part, address financial stability ex-post, or, in the words of Greenspan, monetary policy can only "mitigate the fallout when it occurs and, hopefully, ease the transition to the next expansion."[3] In line with the main policy advice of the literature on the "financial accelerator," in several AEs, central banks responded to the GFC and to the COVID-19 pandemic with expansionary monetary policy and liquidity provision. Nonetheless, the traditional literature and, in particular, that on the financial accelerator is not well suited to provide policy advice on how monetary policy should act to reduce the likelihood of financial crises ex-ante.

On the other hand, a smaller and different area of literature conceives financial crises as endogenous events, which is more consistent with the systemic risk view (e.g., Borio et al., 2001; Borio and Lowe, 2002; Gourio et al., 2018; Svensson, 2012, 2014; Van der Ghote, 2018; Woodford, 2012). This literature models financial crises as the consequence of the previous accumulation of financial imbalances and highlights the importance of considering this in policy-making. Under this more recent notion, in fact, some have argued that monetary policy must play a role in dampening the accumulation of financial imbalances ex-ante, reducing the likelihood of financial crises. This approach is frequently referred to as "leaning against the wind" (see, e.g., Borio et al., 2001; Borio and Lowe, 2002; Cúrdia and Woodford, 2016; Gourio et al., 2018; Svensson, 2012, 2014; Van der Ghote, 2018; Woodford, 2012).[4]

Most of the arguments and counter-arguments of the "leaning against the wind" view have so far focused on AEs. These arguments, however, can only apply partly to EMEs. Rather than purely originating from internal imbalances, as in the case of AEs, in EMEs, financial crises have traditionally also been linked to fluctuations in capital flows. Historically, when fixed exchange rate regimes prevailed, financial crises often originated during a period of buoyant capital inflows leading to real exchange rate appreciation and high credit growth. However, these imbalances often ended in "sudden stops," in which capital flight reduced credit growth and caused currency depreciation, triggering higher inflation and output contractions (see Calvo, 1998; Kaminsky and Reinhart, 1999; Rodrik and Velasco, 1999; Calvo and Reinhart, 2000; Ostry et al., 2012; Caballero, 2016). More recently, as more EMEs have adopted more flexible exchange rate regimes, some authors have argued that a global financial cycle has emerged, in which capital flows are increasingly more correlated globally and are one of the main determinants of financial conditions in EMEs (Rey, 2015; Tobal, 2014, 2017).

Considering this influence of capital flows on financial conditions, this paper sets the terms of the debate on the relationship between monetary policy and financial stability in EMEs. Taking into account the evolution of policy views and academic literature in the years following the GFC, the paper pays particular attention to the ability of the interest rate to dampen financial imbalances, contemplating the extent to which it is possible to lean against the wind in EMEs. Based on these views, we argue that, when using monetary policy to tackle financial stability concerns, EMEs face different policy challenges than AEs do. As financial conditions in EMEs are strongly dependent on capital flows, monetary policy in these economies must balance effects on aggregate demand and on capital flows. Faced with this additional constraint, EMEs must complement their traditional policy toolkit with other instruments, including occasional foreign exchange (FX) interventions and macroprudential policies. We discuss some of the proposals regarding how these additional tools could interact with traditional interest rate policy in EMEs (BIS Annual Report 2019, Chapter II; Basu et al., 2020; Adrian et al., 2020; De Mello, 2008).

The rest of the paper is organized as follows. Section 2 discusses the concept of systemic risk that gained luster after the GFC and presents the debate that arose about the relationship between monetary policy and financial stability. Section 3 discusses the

[2] Although the concept of systemic risk already existed before the GFC (see Bordo et al., 1998), it only gained prominence afterward.

[3] Words of Alan Greenspan (Greenspan, 1999) from his testimony before the Committee on Banking and Financial Services, U.S. House of Representatives, 22nd July 1999.

[4] Other authors, instead, reckon that monetary policy has limited effects on the build-up of these imbalances and that macroprudential policy is sufficient to reduce systemic risk (Collard et al., 2017).

contributions dealing with this relationship for the case of EMEs. Section 4 discusses some recent proposals for a monetary policy framework for EMEs. Section 5 concludes.

2. Systemic risk: implications for monetary policy

Before the 2007–2009 crisis, financial stability was a concept fundamentally linked to risks faced by institutions as isolated components of the financial system. In other words, financial stability was a fundamentally microeconomic concept (Acharya, 2013; Allen and Carletti, 2013). However, perceiving financial institutions as isolated components of the system made it difficult to anticipate the risks leading to the GFC. In fact, the consideration of negative externalities stemming from the links, interactions, and feedback loops of financial institutions contributed to persuading policymakers that financial risk was more endogenous than they originally thought. The existence of externalities gives rise to market failure, thereby providing justification for public intervention.

The need for public intervention has broadened the responsibilities of many central banks by assigning them, de jure or de facto, a new policy goal (i.e., to dampen the build-up of systemic risk). To meet this goal, international institutions, central banks, and regulatory agencies have considered using macroprudential policy, which consists of modifying prudential tools according to, for example, the phase of the financial cycle.[5] However, it has been argued that macroprudential regulation is not enough, that it fosters shadow-banking activities (that lie outside the regulatory perimeter) and is subject to regulatory arbitrage, so that it might not be sufficient to mitigate the build-up of systemic risk. In this context, a debate has emerged over whether monetary policy should complement macroprudential policy in dampening the build-up of systemic risk (i.e., whether it should "lean against the wind").

That monetary policy may address the build-up of systemic risk relies on the view of financial crises as endogenous events, in which the accumulation of financial imbalances *causes* the crash. As mentioned, this view cannot be easily captured by the "financial accelerator" literature that, building on the original contributions of Bernanke et al. (1999) and Kiyotaki and Moore (1997), introduced financial frictions in sticky price New Keynesian business cycle models. This literature, in fact, studies how monetary policy can respond to *exogenous shocks* that may be amplified by financial frictions (Cúrdia and Woodford, 2016; Christiano et al., 2004 Gerali et al., 2010; Gertler and Karadi, 2011; Gertler and Kiyotaki, 2010). According to this literature, shocks that cause financial crises must be addressed by expansionary monetary policy and liquidity provision (Cúrdia and Woodford, 2016; Gerali et al., 2010; Gertler and Karadi, 2011; Gertler and Kiyotaki, 2010). In line with this view, these policies were used in a timely way during the GFC and the present pandemic to stabilize financial markets in several AEs.[6]

Contrary to the "financial accelerator" approach, which contributed to understanding how monetary policy can approach financial shocks ex-post, the debate over the role of monetary policy in preventing crises is based on the idea that financial crises are endogenous events. In fact, if financial crises are caused by the previous build-up of financial imbalances, the natural question is whether monetary policy should tackle this accumulation ex-ante. In this context, two views have been proposed: the "leaning against the wind" view, according to which monetary policy should be employed to address the accumulation of financial imbalances, and the "modified Jackson Hole consensus" (Smets, 2014), which suggests that macroprudential policy is enough for the purpose and, therefore, monetary policy must focus on its traditional task.

The "leaning against the wind" view proposes that there is a financial cycle with an amplitude and duration very different from that of the business cycle in which institutions interact in complex and nonlinear ways, causing financial imbalances to accumulate (Borio and Lowe, 2002; White, 2006). In the financial cycle, such variables as credit growth and asset prices exhibit cyclical behavior that is not necessarily correlated over time with the behavior of the output gap and inflation (Borio et al., 2013). In fact, this cyclical behavior can lead to the accumulation of financial imbalances in the upturn of the cycle and financial crises in the downturn (Borio and Lowe, 2002). During the upturn of the cycle, excessive growth in credit and leverage generate asset price revaluations and thus capital gains for financial institutions. In turn, these capital gains further fuel credit growth and leverage, generating further increases in asset prices and additional capital gains, and so on. However, this leads financial institutions to deleverage massively during the downturn. Massive deleveraging ends up drying credit availability, triggering sharp drops in asset prices and, consequently, generating capital losses for several financial institutions (Adrian and Shin, 2009; Brunnemeir and Sannikov, 2016).

In this context, monetary policy can mitigate or exacerbate these financial imbalances (Woodford, 2012; Adrian and Shin, 2009; Rajan, 2005). A higher interest rate in the upturn of the cycle can mitigate excessive credit growth and leverage, leading to lower increases in asset prices and thus reducing capital gains (Adrian and Shin, 2009; Rajan, 2005). This in turn reduces the likelihood that financial institutions deleverage massively in the downturn, avoiding excessive capital losses and defaults (Adrian and Shin, 2009; Rajan, 2005).

In practice, according to the "leaning against the wind" view, monetary policy should consider financial stability. When excessive financial imbalances accumulate, central banks might have to deviate from their inflation target temporarily to minimize the probability that a financial crisis will occur (Borio and Lowe, 2002; Adrian and Shin, 2009; Woodford, 2012; Ajello et al., 2019). Aside from this potential effect of monetary policy, this view also argues that macroprudential policy cannot fully address the accumulation of financial imbalances and systemic risk because there are institutions lying outside the regulatory perimeter, such as shadow banks (Stein, 2013). Moreover, the use of macroprudential tools may shift risks outside their direct area of influence (i.e., it is subject to

[5] For instance, implementing an additional capital buffer during the upturn of the financial cycle to mitigate the build-up of imbalances, and then releasing the buffer during the downturn so that it can be used to absorb losses.

[6] There are some notable differences, however, in the way central banks responded to the two crises, in particular concerning liquidity provision. In contrast to the GFC, when this provision took the form of purchases of government bonds and asset-backed securities, in the COVID-19 pandemic, emergency lending went further, aiming at reaching nonfinancial businesses, states, and municipalities (Logan, 2020; Hiteshew, 2020).

regulatory arbitrage). In contrast, monetary policy is a blunt tool, as it affects the cost of borrowing and asset prices for all economic agents (Stein, 2013).

The second view, in the words of Smets (2014), the "modified Jackson Hole consensus," in contrast, argues that monetary policy should focus on its traditional price stability objective, because the interest rate is not the best tool to address the level of risk taken by financial institutions, and thus financial stability (Bean et al., 2010; Gerlach, 2010; Svensson, 2012, 2013; Collard et al., 2017). According to this view, in the presence of limited liability and deposit insurance, banks only partially bear the costs of bankruptcies and thus have incentives to take more risk than would be socially optimal. This excessive risk taking would manifest itself in the composition of banks' credit portfolio as they funded risky projects and not necessarily in a larger volume of credit. As monetary policy works only through the volume of credit, it does not have first-order effects on risk-taking incentives and financial stability, which is why monetary policy should focus on its traditional goal, that is, price stability (Collard et al., 2017).

This view explains that macroprudential policy directly affects the incentives of financial institutions by modifying the cost of bankruptcy, and it thereby contributes to preserving financial stability. For instance, a rise in capital requirements increases bankruptcy costs, forcing banks to internalize the effects of their risk-taking behavior on the stability of the financial system and, as a result, taming risk. Although this view concludes that, in general, monetary policy should not be used for macroprudential purposes, it argues that central banks should monitor and exchange financial information, because financial factors largely determine the effectiveness of the transmission mechanisms of monetary policy (Adrian et al., 2013; Collard et al., 2017; Bean et al., 2010; Gerlach, 2010; Svensson, 2012, 2013).

3. Monetary policy and financial stability in EMEs

EMEs are different from AEs in several dimensions, many of which make their policy trade-offs more complex. Although several EMEs went through a period of relative macroeconomic and financial stability in the late 1990s and early 2000s, most of them went through debt and currency crises and periods of high inflation not too long ago. This creates a series of additional difficulties for policymaking. For instance, the fact that price stability is a more recent phenomenon implies that inflation expectations tend to be more volatile in EMEs, making it more difficult for monetary policy to achieve low inflation than in AEs. Moreover, the fact that currency stability is a more recent phenomenon implies that, in some EMEs, the public is less confident about the strength of their local currency. Thus, currency mismatches are more common in these countries, which generates additional macrofinancial risks, as the presence of these mismatches implies that currency depreciations can trigger negative balance sheet effects.

An additional dimension in which EMEs are different from AEs is that they are more reliant on foreign credit, and therefore on capital flows (Menna and Tobal, 2018). The importance of capital flows for credit growth and financial stability in EMEs was originally documented in the literature on currency crises (see Calvo, 1998; Kaminsky and Reinhart, 1999; Rodrik and Velasco, 1999; Calvo and Reinhart, 2000; Ostry et al., 2012; Caballero, 2016). According to this literature, possibly driven by global developments (e.g., lower global risk aversion or loose monetary conditions in global financial centers) or by domestic factors (e.g., a more stable macroeconomic environment), EMEs initially receive large capital inflows for a prolonged period, leading to an accumulation of macrofinancial imbalances, such as excessive credit growth. However, this process ends at some point, and a "sudden stop" leads to a capital flow reversal that forces the authorities, in the context of a fixed exchange rate regime, to defend the peg until reserves are deployed, drying up credit availability, causing a devaluation, and, possibly, triggering a financial crisis.

The importance of capital flows for credit growth and financial stability in EMEs is not limited to fixed exchange rate regimes. As more EMEs have adopted more flexible exchange rate regimes, the recent literature argues that the importance of capital flows has not disappeared but rather has taken a distinct form (Tobal, 2014, 2017). This literature emphasizes the existence of a global financial cycle in which capital flows are correlated across countries and strongly affect leverage, credit growth, and asset prices in recipient countries. Moreover, these flows are mostly determined by global factors such as the global appetite for risk or monetary policy in global financial centers. Thus, global factors strongly affect domestic financial conditions through their impact on capital flows (see Bruno and Shin, 2015; Passari and Rey, 2015; Rey, 2015; Buch et al., 2019; Obstfeld et al., 2019). Indeed, even under a flexible exchange rate regime, excessive capital flows raise credit supply and compress risk premiums. This may result in domestic borrowers in EMEs increasing leverage, sometimes in foreign currency, and in possible asset price bubbles. By increasing the probability of abrupt adjustments in credit and asset markets, excessive capital flows raise financial risk.

Although this literature has documented the influence of external conditions and capital flows on financial conditions in EMEs, the debate on the role of macroprudential and monetary policies in addressing financial risk has received much less attention. In this respect, the literature has mostly dealt with AEs. Some contributions, however, capture relevant points. These contributions do not take a clear stance on whether macroprudential policies are sufficient to tackle financial stability risk or whether monetary policy is needed. Rather, most of them illustrate channels through which these policies influence financial risks. Given that our aim in this paper is to discuss "leaning against the wind" in EMEs, in our review, we focus mainly on monetary policy. In the next section, however, we discuss some recent views of policymakers on the appropriate macroprudential-monetary mix in EMEs.

In the case of EMEs, whereas most contributions follow the traditional financial accelerator approach of Kiyotaki and Moore (1997), Bernanke et al. (1999), Iacoviello (2005), and Curdia and Woodford (2016), more recent developments in the literature perceive financial crises as endogenous events and consider the importance of capital flows (see reference to Menna and Tobal, 2018, below). In the context of EMEs, the traditional financial accelerator approach frequently assumes that exogenous shocks affect capital flows notably. For example, Davis and Presno (2017), Jalali-Naini and Naderian (2020), and Unsal (2011) introduce financial frictions that give rise to deviations from uncovered interest parity. In their setups, borrowers in EMEs pay to borrow abroad at an interest rate that is higher than the world interest rate (expected depreciation adjusted); in other words, their setups feature financial frictions that

generate a risk premium in EMEs. In this context, shocks that hit the risk premium induce changes in capital flows and, ultimately, end up producing excessive fluctuations in output and inflation.

In the financial accelerator approach, the transmission from shocks to risk premiums and then to excessive fluctuations in output and inflation happens through two main channels: the "aggregate demand" channel and the "depreciation" channel. In the first of these mechanisms, a reduction in capital flows diminishes credit, leading to lower aggregate demand; a depressed demand, in turn, reduces output growth and, through a Phillips curve channel, exerts downward pressure on prices. In the second channel, a reduction in capital flows causes the domestic currency to depreciate; this depreciation increases the cost of imported goods and, through a pass-through channel, exerts upward pressure on prices.

In the presence of foreign currency debt, the depreciation channel can also feed back into an even higher risk premium, as balance sheet effects increase the default probability of domestic borrowers. Overall, shocks to the risk premium can cause credit and output contractions and, depending on the relative importance of the pass-through vis-à-vis the Phillips curve channel, inflation may rise or fall. In general, the trade-off between inflation, on the one hand, and output and credit, on the other, is more unfavorable for EMEs than for AEs.

Jalali-Naini and Naderian (2020) estimate a model for Iran in which the risk premium depends on the real exchange rate and on an exogenous shock. In this relationship, the real exchange rate captures that currency depreciations produce balance sheet effects, raising the probability of default, whereas the exogenous shock affects credit availability in global financial markets. They consider a commodity exporting country. When a shock to commodity prices hits, the country's terms of trade deteriorate and its currency depreciates, triggering negative balance sheet effects and thus raising the risk premium. Hence, the commodity price shock leads to a reduction in credit availability, depressed aggregate demand, and further currency depreciations; therefore, as a result of the shock, output shrinks and inflation increases. In this context, the authors show that a central bank can complement interest rate policy with occasional FX interventions. The use of these interventions mitigates the trade-off faced by the central bank in the short run by reducing inflation volatility for given levels of credit and output contractions.

Contrary to Jalali-Naini and Naderian (2020), Unsal (2011) provides micro-foundations for financial frictions. Following Bernanke et al. (1999), Unsal (2011) models financial frictions as arising from agency costs, whereby monitoring domestic borrowers is costly for foreign investors. Specifically, in Unsal's (2011) setup, risk premium is affected by shocks to foreign investors' perceptions of domestic entrepreneurs' productivity: When these perceptions worsen, a credit crunch ensues and entrepreneurs reduce investment, causing output to shrink. The pass-through of currency depreciation into consumer prices is lessened by the existence of sticky import prices, which react to depreciation only sluggishly. Consequently, in this model, the Phillips curve channel dominates over the pass-through channel and inflation falls. In this context, Unsal (2011) finds that lower policy rates are, at least partially, effective at offsetting the impact of the higher risk premium on borrowing rates. Nonetheless, interest rate policy can be complemented effectively with the use of countercyclical macroprudential tools.

Following Kiyotaki and Moore (1997), Davis and Presno (2017) model financial frictions as arising from collateral constraints, which limit the credit that entrepreneurs can obtain in global financial markets on the value of their assets. A shock to the foreign interest rate leads to capital outflows and pushes domestic asset prices downwards, tightening the collateral constraint. Thus, the shock ends up causing investment to plunge and output to fall. The authors analyze monetary policy by means of a micro-founded loss function that responds to the price of domestically produced goods, rather than to consumer price inflation, implying that by construction, the policymaker to some extent ignores the pass-through channel.[7] In the presence of financial frictions, entrepreneurs' intertemporal decisions are distorted, as they cannot increase borrowing when the collateral constraint is binding. Hence, under the assumptions stated, the loss function places a non-negligible weight on the foreign interest rate: By considering foreign interest rates when implementing monetary policy, the central bank can stimulate foreign investment in the domestic economy, thereby dampening capital outflows and relaxing the collateral constraint faced by entrepreneurs.

In contrast to this strand of the literature, focused on the amplification of exogenous shocks in EMEs, more recent developments perceive financial crises as endogenous events and capital flows as critical for financial conditions in EMEs. Menna and Tobal (2018) follow Ajello et al. (2019) and introduce financial crises in a two-period framework: Economic conditions in period one determine credit growth, and this, in turn, determines the probability that a financial crisis will occur in period two. Borrowing from the micro-foundations of Curdia and Woodford (2016), they develop a small open economy setup in which they micro-found the relationship between capital flows and credit growth. In particular, in their model, some households are savers and other households are borrowers, depending on their preferences for current vs. future consumption. In both the closed and the open economy version of the model, higher demand on the part of borrowers raises both credit growth and the output gap, giving rise to a positive correlation between the two. Only in the open economy version, however, can savers borrow from global financial markets. When they do, they lend some of the funds they obtain abroad to domestic borrowers, leading to a positive correlation between capital inflows and credit growth. Then, to the extent that capital flows are excessive, they could fuel credit growth; a surge of excessive capital inflows also increases the probability that a financial crisis will occur, in line with the evidence (Bruno and Shin, 2015; Buch et al., 2019; Forbes and Warnock, 2012; Fratzscher et al., 2017; Passari and Rey, 2015; Rey, 2015).

In this framework, raising the interest rate reduces the output gap and, through this channel, generates a downward impact on the demand for credit, just as in a closed-economy scenario. In turn, this reduces credit growth and, therefore, crisis probability. However, a higher interest rate also attracts capital flows, increasing credit supply and thereby exerting an opposing impact on credit growth and crisis probability. Thus, in the context of their model, the interest rate has a smaller impact on credit growth and crisis probability

[7] Indeed, it is the loss function considered by Gali and Monacelli (2005).

in a small open economy than it does in a closed one, suggesting that a strong dependence of financial conditions on capital flows weakens the ability of monetary policy to "lean against the wind" in EMEs. To put it differently, Menna and Tobal's (2018) work suggests that the prescription of the "leaning against the wind" approach should not be applied to EMEs in the same way as it has usually been applied in the case of AEs.

Mechanisms similar to those modeled formally by Menna and Tobal (2018) have also been emphasized by policymakers in EMEs. As discussed by De Gregorio (2010) and Agénor and Da Silva (2012), in fact, central banks in these countries face a complex environment, in which using monetary policy to lean against financial imbalances is generally less effective. In particular, a more aggressive policy stance to offset asset price bubbles and excessive leverage may lead to only limited results, as additional capital flows contribute to a higher credit supply and more demand for assets. Similarly, in EMEs that are commodity exporters, financial conditions are often driven by commodity prices in global markets, over which monetary policymakers do not have control. In particular, higher commodity prices reduce risk premiums on foreign debt in these countries, increasing capital flows and encouraging higher leverage (Khotulev and Styrin, 2019).

4. Monetary and macroprudential policies in EMEs

While academic work tends to concentrate on narrow questions, the complexity of the policy world sometimes requires a more comprehensive approach. In this context, and considering the complexity of the trade-offs faced by EMEs, several institutions and international organizations have proposed more unified frameworks to analyze the use of monetary policy in these countries. Particular effort in this direction has been made by the BIS, as well as by authors affiliated with the IMF and the OECD (BIS Annual Report 2019, Chapter II; Basu et al., 2020; Adrian et al., 2020; De Mello, 2008). These authors acknowledge the need to address financial stability concerns in EMEs and study how interest rate policy can be used jointly with other policy instruments, including FX interventions and macroprudential policy, to this end. A common conclusion is that neither policy tool is sufficient to fully tackle financial stability concerns in EMEs. Instead, these studies suggest that all policy tools, including monetary policy, must be used together in a coherent way. Furthermore, they emphasize that this should not lead us to underscore the relative merits of inflation-targeting regimes.

The BIS and several authors at the IMF emphasize that FX interventions can help interest rate policy achieve price and financial stability objectives simultaneously. In particular, these authors emphasize that capital flows' volatility can cause exchange rate swings, resulting, in turn, in short-term fluctuations of inflation. Although too short lived to be addressed with interest rate policy, these fluctuations can still increase the risk of de-anchoring inflation expectations (Ho and McCauley, 2003; Ha, Kose and Ohnsorge, 2019). Hence, occasional FX interventions can effectively counteract exchange rate swings, thus mitigating risk and providing more leeway for monetary policy (BIS Annual Report 2019, Chapter II).

This view is shared by Adrian et al. (2020), from the IMF, who argue that FX interventions are frequently more useful in countries with a history of not well-anchored inflation expectations. Similarly, other authors argue that these interventions are more useful in countries in which foreign currency debt is unhedged (Chui et al., 2016), as well as in EMEs whose exports are mainly invoiced in US dollars (Liriano, 2017; Chuaprapaisilp et al., 2018). In these countries, the trade-off between financial and inflation stability is worsened by a weak trade channel through which depreciations increase output growth, making short-term stabilization of the exchange rate more useful. On the other hand, these works highlight the disadvantages of using FX interventions regularly. They note that the systematic use of these interventions to support the exchange rate can lead to large reserve losses and may deter the development of hedging markets, as well as encourage excessive taking of foreign currency debt (Adrian et al., 2020).

According to these works, macroprudential tools must be used to complement interest rate policy in achieving price and financial stability (Claessens, 2015; Bruno et al., 2017; Gambacorta and Murcia 2020). The BIS, for example, has claimed that countercyclical capital buffers, dynamic provisions, and maximum loan-to-value and debt-to-income ratios can be used to address vulnerability in the financial sector directly (BIS Annual Report 2019, Chapter II). It has also been noted that regulation preventing excessive currency mismatches in the banking sector is particularly useful in EMEs, as it helps avoid capital inflows generating rising exposure to FX risk (BIS Annual Report 2019, Chapter II). In a context in which capital flows are increasingly channeled to the nonfinancial sector directly, the possibility of regulating corporations' exposure to FX rate risk has also been considered.

Other authors at the IMF analyze monetary policy, FX interventions, and macroprudential policies in EMEs in a unified framework (Basu et al., 2020).[8] They extend a basic open economy model in the Mundell-Fleming tradition with additional useful ingredients, including dollar invoicing, shallow capital markets, domestic and external borrowing constraints, and currency mismatches. In this context, they show that using interest rate policy, macroprudential policies, and FX interventions in unison is useful to achieve inflation, output, and financial stability objectives. In particular, they argue that macroprudential policies and FX interventions make interest rate policy more independent from external conditions, allowing it to put less weight on financial stability. However, they note that choosing the correct mix of policies requires correct identification of shocks, which can be challenging to do in real time. Moreover, they note that using several tools at the same time makes communication harder, which can create uncertainty about the future course of action of the central bank and make anchoring expectations more difficult.

Several policy works also claim that, although traditional interest rate policy can be used along with other policy tools to address financial stability concerns, this should not obscure the fact that inflation targeting has allowed EMEs to achieve far better results in

[8] They also consider capital controls. They find that macroprudential policies can play the same role of capital controls, at least under some modeling assumptions. This is the case, in particular, when macroprudential policies are sufficiently encompassing as to efficiently address imbalances in both financial and nonfinancial borrowers.

terms of price and financial stability than in the past (De Mello, 2008). De Mello (2008), in fact, highlights that explicit inflation targets and more forward-looking monetary policies have allowed EMEs to manage expectations far better and obtain sustainable reductions in both inflation and inflation volatility. However, these achievements were not obtained only through monetary policy. Better macroeconomic management, better institutions, more credible fiscal policies, and, in many cases, external debt renegotiation also created the preconditions that allowed monetary policy to operate and credibly commit to an inflation target in EMEs (De Mello, 2008). These preconditions need to be met in the future for any monetary policy framework in EMEs to work efficiently.

5. Conclusions

The GFC, the slow recovery that ensued, and the present pandemic have given rise to a debate on the use of monetary policy for financial stability purposes. Based on the idea that financial crises are endogenous events, this debate focuses on the ability of monetary policy to reduce crisis probability by "leaning against the wind." This debate, however, has dealt for the most part with AEs. In contrast to AEs, EMEs are strongly reliant on foreign credit and therefore face risks stemming from the direction and volatility of capital flows. Hence, the nature of the relationship between monetary policy and financial stability in EMEs is different, highlighting the need to set a debate that considers the specific characteristics and risks faced by these economies.

In response to this need, recent literature has studied the link between monetary policy and financial stability in EMEs, focusing on how external conditions and capital flows exert an important influence over financial stability. Most contributions follow the traditional financial accelerator approach and do not capture the reality of financial crises as endogenous events, triggered by the previous accumulation of financial imbalances. As such, they concentrate on understanding how monetary policy can react to crises once they materialize. More recent contributions, however, follow Ajello et al. (2019) and model crises as endogenous events caused by excessive credit growth (Menna and Tobal, 2018).

In both approaches, monetary policy faces a more complex trade-off when dealing with financial stability in EMEs comparison with AEs. As for the first approach, in which financial stress is generated by exogenous shocks to capital flows, financial instability finds output and inflation moving in opposite directions, making it harder to stabilize both simultaneously. As for the second approach, in which crises are endogenous, interest rate policy may be less effective at reining in excessive credit growth, as it may spur additional capital inflows. This line of research is still incipient, and there is yet much progress to be made in incorporating several of the idiosyncrasies that make EMEs different from AEs. This further research could provide better understanding of how monetary policy faces different challenges in EMEs relative to AEs. This is particularly relevant in the world of the "saving glut" (Bernanke, 2005) and "secular stagnation" (Summers, 2015) in which, possibly due to rising saving rates and a lack of investment opportunities, low interest rates have become the norm.

Declaration of Competing Interest

None.

References

Acharya, V., 2013. Adapting micro prudential regulation for emerging markets. In: Ottaviano, Canuto, Swati, R.Ghosh (Eds.), Dealing with the Challenges of Macro Financial Linkages in Emerging Markets. World Bank, pp. 57–89.

Adrian, T., Covitz, D., Liang, N., 2013. Financial Stability Monitoring. Federal Reserve Bank of New York Staff Report No. 601.

Adrian, T., Erceg, C., Lindé, J., Zabczyk, P., & Zhou, J. "A Quantitative Model for the Integrated Policy Framework," IMF Working Paper, WP/20/122

Adrian, T., Shin, H.S., 2009. Money, liquidity, and monetary policy. Am. Econ. Rev. 99 (2), 600–605.

Agénor, P.R., Pereira da Silva, L.A., 2012. Macroeconomic stability, financial stability, and monetary policy rules. Int. Financ. 15 (2), 205–224.

Ajello, A., Laubach, T., López-Salido, D., y Nakata, T., 2019. Financial stability and optimal interest rate policy. Int. J. Central Bank. 15 (1), 279–326.

Allen, F., Carletti, E., 2013. What is Systemic Risk? J. Money Credit Bank. 45 (s1), 121–127.

Bank of International Settlements, 2019. Annual economic report 2019. Chapter II. Monetary Policy Frameworks in EMEs: Inflation targeting, the Exchange Rate and Financial Stability.

Basu, S., Boz, E., Gopinath, G., Roch, F., & Unsal, F. "A Conceptual Model for the Integrated Policy Framework," IMF Working Paper,WP/20/121 2020

Bean, C., Paustian, M., Penalver, A., Taylor, T., 2010. Monetary policy after the fall. In: Macroeconomic Challenges: The Decade Ahead. Proceedings of the Federal Reserve Bank of Kansas City. Economic Policy Symposium. Jackson Hole, Wyoming August 26–28.

Bernanke, B., (2005). "The Global Saving Glut and the U.S. Current Account Deficit," Speech 77, Board of Governors of the Federal Reserve System (U.S.).

Bernanke, B., Gertler, M., Gilchrist, S., 1999. The financial accelerator in a quantitative business cycle framework. In: Handbook of Macroeconomics, 1. Elsevier, pp. 1341–1393 (C), pages.

Board, Financial Stability. "International Monetary Fund (IMF)/Bank for International Settlements (BIS) Macroprudential Policy Tools and Frameworks, Update to G20 Finance Ministers and Central Bank Governors, March, Bank for International Settlements, Basel." (2011).

Board of Governors of the Federal Reserve System (US) (2020). "Federal Open Market Committee Announces Approval of Updates to its Statement on Longer-Run Goals and Monetary Policy Strategy" [Press release].

Borio C., Disyatat F.P., and Juselius, M. (2013). "Rethinking Potential Output: Embedding Information About the Financial Cycle," BIS Working Papers 404.

Bordo, Michael D., Mizrach, B., Schwartz, A., 1998. Real versus Pseudo-International Systemic Risk: Some Lessons from History. Review of Pacific Basin Financial Markets and Policies 1 (1), 31–58.

Borio, C., Furfine, C., Lowe, P., 2001. Procyclicality of the financial system and financial stability: issues and policy options. BIS Pap. 1, 1–57.

Borio, C., Lowe, P., 2002. Asset Prices, Financial and Monetary Stability: Exploring the Nexus. Bank for International Settlements, p. 114.

Brunnermeier, Markus, Sannikov, Y., 2016. The I Theory of Money. Princeton University Working Paper.

Bruno, V., Shim, I., Shin, H.S., 2017. Comparative assessment of macroprudential policies. J. Financ. Stab. 28, 183–202.

Bruno, V., Shin, H.S., 2015. Cross-border banking and global liquidity. Rev. Econ. Stud. 82 (2), 535–564.

Buch, C.M., Bussiere, M., Goldberg, L., Hills, R., 2019. The international transmission of monetary policy. J. Int. Money Financ. 91, 29–48.

Caballero, J.A., 2016. Do surges in international capital inflows influence the likelihood of banking crises? Econ. J. 126 (591), 281–316 03.

Calvo, G.A., 1998. Capital flows and capital-market crises: the simple economics of sudden stops. J. Appl. Econ. 1, 35–54 November.

Calvo, G., Reinhart, G.Kenen, P., Swoboda, A. (Eds.), 2000. "When capital inflows come to a sudden stops: consequences and policy options. Reforming the International Monetary and Financial System 2000, 175–201.
Carlstrom, C., Fuerst, T., 1997. Agency costs, net worth, and business fluctuations: a computable general equilibrium analysis. Am. Econ. Rev. 87 (5), 893–910.
Christiano, L.J., Gust, C., Roldos, J., 2004. Monetary policy in a financial crisis. J. Econ. Theory 119 (1), 64–103.
Chui, M., E. Kuruc and P. Turner (2016): "A New Dimension to Currency Mismatches in the Emerging Markets – Non-Financial Companies," BIS Working Papers, no 550.
Chuaprapaisilp, T., Rujiravanich, N., Saengsith, B., 2018. FX Hedging Behavior among Thai Exporters: A Micro-level Evidence, 81. Puey Ungphakorn Institute for Economic Research PIER Discussion Papers.
Claessens, S., 2015. An overview of macroprudential policy tools. Annu. Rev. Financ. Econ. 7, 397–422.
Collard, F., Dellas, H., Diba, B., Loisel, O., 2017. Optimal monetary and prudential policies. Am. Econ. J.: Macroecon. 9 (1), 40–87.
Cúrdia, V., Woodford, M., 2016. Credit frictions and optimal monetary policy. J. Monet. Econ. 84 (C), 30–65.
Davis, J.S., Presno, I., 2017. Capital controls and monetary policy autonomy in a small open economy. J. Monet. Econ. 85 (C), 114–130.
De Gregorio, J., 2010. Monetary policy and financial stability: an emerging markets perspective. Int. Financ. 13 (1), 141–156.
De Mello, L. (Ed.), 2008. Monetary Policies and Inflation Targeting in Emerging Economies. OECD.
European Central Bank (2020). "ECB Announces €750 Billion Pandemic Emergency Purchase Programme (PEPP)" [Press release].
Fratzscher, M., Lo Duca, M., Straub, R., 2017. On the international spillovers of US quantitative easing. Econ. J. 128 (608), 330–377.
Forbes, K.J., Warnock, F.E., 2012. Capital flow waves: surges, stops, flight, and retrenchment. J. Int. Econ. 88 (2), 235–251.
Gali, J., Monacelli, T., 2005. Monetary policy and exchange rate volatility in a small open economy. Rev Econ Stud 72 (3), 707–734.
Gambacorta, L., Murcia, A., 2020. The impact of macroprudential policies in Latin America: an empirical analysis using credit registry data. J. Financ. Intermed. 42, 100828.
Gerali, A., Neri, S., Sessa, L., Signoretti, F.M., 2010. Credit and banking in a DSGE model of the euro area. J. Money Credit Bank. 42, 107–141.
Gerlach, S., 2010. Asset prices and monetary policy: some sceptical observations. In: The Quest for Stability: The Macro View. Société Universitaire Européenne de Recherches Financières, SUERF, pp. 45–60.
Gertler, M., Karadi, P., 2011. A model of unconventional monetary policy. J. Monet. Econ. 58 (1), 17–34.
Gertler, M., Kiyotaki, N., 2010. Financial intermediation and credit policy in business cycle analysis. In: Handbook of Monetary Economics, 3. Elsevier, pp. 547–599.
Gourio, F., Kashyap, A.K., Sim, J.W., 2018. The trade offs in leaning against the wind. IMF Econ. Rev. 66 (1), 70–115.
Greenspan, A., 1999. Statement to Congress, July 22, 1999 (semi-annual monetary policy report). Federal Reserve Bulletin, Board of Governors of the Federal Reserve System (U.S.), pp. 626–631 issue Sep.
Ha, J., Kose, M.A., Ohnsorge, F. (Eds.), 2019. Inflation in Emerging and Developing economies: Evolution, Drivers, and Policies. World Bank Publications.
Ho, C., & McCauley, R.N. (2003). "Living with Flexible Exchange Rates: Issues and Recent Experience in Inflation Targeting Emerging Market Economies," BIS Working Papers, no 130.
Iacoviello, Matteo, 2005. House Prices, borrowing constraints, and monetary policy in the business cycle. Am. Econ. Rev. 95 (3), 739–764.
Jalali-Naini, A.R., Naderian, M.A., 2020. Financial vulnerability, fiscal procyclicality and inflation targeting in developing commodity exporting economies. The Quarterly Review of Economics and Finance 77, 84–97.
Kaminsky, G., Reinhart, C., 1999. The twin crises: the causes of banking and balance of payment problems. Am. Econ. Rev. 89 (3), 473–500.
Hiteshew, K., 2020. Municipal liquidity facility. Testimony Before the Congressional Oversight Commission. Federal Reserve Board Sept. 17.
Khotulev, I., & Styrin, K. (2019). "Optimal Monetary and Macroprudential Policies for Financial Stability in a Commodity-Exporting Economy," Bank of Russia. No. wps52
Kiyotaki, N., Moore, J., 1997. Credit cycles. J. Poliical. Econ. 105 (2), 211–248.
Liriano Miguel, Faruk, 2017. The use of foreign exchange derivatives by exporters and importers: the Chilean experience. IFC Bulletins chapters, in: Bank for International Settlements (ed.), Statistical implications of the new financial landscape, volume 43, Bank for International Settlements.
Logan, L., 2020. The Federal Reserve's Recent Actions to Support the Flow of Credit to Households and Businesses. Federal Reserve Bank of New York Speech 87826.
Menna, L., and Tobal, M. (2018). Financial and Price Stability in Emerging Markets: The Role of the Interest Rate. *BIS Working Papers*, no. 717.
Obstfeld, M., Ostry, J.D., Qureshi, M.S., 2019. A tie that binds: revisiting the trilemma in emerging market economies. Rev. Econ. Stat. 101 (2), 279–293.
Ostry, J.D., Ghosh, A.R., Chamon, M., Qureshi, M.S., 2012. Tools for managing financialstability risks from capital inflows. J. Int. Econ. 88 (2), 407–421.
Passari, E., Rey, H., 2015. Financial flows and the international monetary system. Econ. J. 125 (584), 675–698.
Rajan, R. (2005). "Has Financial Development Made the World Riskier?" *NBER Working Papers*,11728.
Rey, H., 2015. Dilemma Not Trilemma: The Global Financial Cycle and Monetary Policy Independence. National Bureau of Economic Research No. w21162.
Rodrik, D., Velasco, A., 1999. Short-Term Capital Flows. National Bureau of Economic Research, Inc *NBER Working Papers 7364*.
Smets, F., 2014. Financial stability and monetary policy: how closely interlinked? Int. J. Central Bank. 10 (2), 263–300.
Stein, J.C., 2013. Overheating in credit markets: origins, measurement, and policy responses. Speech Given to the Symposium On Restoring Household Financial Stability After the Great Recession, 7. Federal Reserve Bank of St. Louis, St. Louis, Missouri February (Vol..
Summers, L.H., 2015. Demand side secular stagnation. Am. Econ. Rev. 105 (5), 60–65.
Svensson, L., 2012. The relation between monetary policy and financial policy. Int. J. Central Bank. 8 (S1), 293–295.
Svensson, L., 2013. Some lessons from six years of practical inflation targeting. Paper prepared for Riksbank conference on Two Decades of Inflation Targeting: Main Lessons and Remaining Challenges Stockholm, June 3.
Svensson, L., 2014. Inflation targeting and leaning against the wind. Int. J. Central Bank. 10 (2), 103–114.
Taylor, J.B., 1993. Discretion versus policy rules in practice. In: Proceedings of Carnegie-Rochester Conference Series on Public Policy, 39, North-Holland, pp. 195–214.
Tobal, Martín, 2014. Prudential regulation, Currency Mismatches and Exchange Rate Regimes in Latin America and the Caribbean. Verlag nicht ermittelbar.
Tobal, Martín, 2017. Prudential regulation, Currency Mismatches and Exchange Rates in Latin America and the Caribbean. Banco de México Working Papers, No. 2017-21.
Unsal, D.F., 2011. Capital Flows and Financial stability: Monetary Policy and Macroprudential Responses. International Monetary Fund No. 11-189.
Van der Ghote, A. (2018). "Coordinating Monetary and Financial Regulatory Policies."
White, W.R. (2006). "Procyclicality in the Financial System: do We Need a New Macrofinancial Stabilisation Framework?." BIS Working Paper No. 193.
Woodford, M., 2012. Inflation targeting and financial stability. Sveriges Riksbank: Econ. Rev. 1, 7–32.