

Introduction

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Financial instability can have devastating consequences on economic activity, price stability and the monetary policy transmission mechanisms. This is hardly news for Latin America and the Caribbean that have an unfortunate history of financial struggles that has led to a widespread inclusion of an explicit financial stability mandate in many central banks. Given the prevalence of this financial stability mandate, policy making could benefit from a better understanding of the monetary policy-financial stability nexus. This book presents efforts made through joint research among central banks' economists of the Americas to advance in this front.

According to Ingves et al.,¹ there are three main reasons why central banks should have a prominent role in the design and implementation of financial stability policy: 1) financial instability affects the macroeconomic environment; 2) central banks, in their role of lenders of last resort, provide liquidity that could be important for financial stability; and 3) central banks have a comprehensive understanding of the financial system required to design and implement

¹ Stefan Ingves et al., *Central Bank Governance and Financial Stability*, Study Group Report, BIS, May, 2011.

macroprudential policies. Although there is an agreement of this relevant role that monetary authorities should have, we still need to advance on the determination of how central banks should contribute to financial stability.

During the last decade, an increasing number of countries have strengthened prudential policies in response to financial stability concerns. Those prudential policies aim to 1) reinforce the solvency and control the leverage of financial intermediaries; 2) contain liquidity risks; 3) limit risk associated with unexpected changes in interest and exchange rates; and 4) reduce negative externalities that could be magnified by the interconnectedness of financial intermediaries. Despite their increasing use, analysis of the efficiency of these risk-containing prudential policies and their interaction with monetary policy is an understudied area. Also, there is a need to better understand the country-level specifics of the monetary policy-financial stability interactions in order to explore the potential benefits of regional policy coordination.

This book has seven chapters that give insights on different issues related to monetary policy and financial stability. The first two look at the effect of changes in monetary policy on the credit supply in Bolivia and Guatemala, respectively, and the differentiated effect depending on the banks' characteristics. The third one studies the relation between credit and economic activity in Costa Rica, the Dominican Republic, El Salvador, Honduras, Guatemala, and Nicaragua, finding a positive relation. The fourth research analyzes the determinants of banks' capital buffers in a sample of 456 Latin American and Caribbean banks. The fifth describes mechanisms on how financial conditions interact with monetary policy to determine macroeconomic outcomes within a DSGE model estimated for the USA. The last two papers analyze the effects of foreign exchange (FX) interventions in Brazil and Mexico. The sixth paper compares the effectiveness of the different types of interventions that those two countries have, while the seventh paper uses realized volatility as an instrument to measure the average effect of a dollar sell or buy on the Brazilian exchange rate.

Below we pose three organizing questions on the relation between monetary policy and financial stability that guided the joint research work and describe each chapter in more detail.

1. How Does Monetary Policy Affect Financial Stability?

Monetary policy impacts financial stability through its effect on asset prices and on financial markets' risk taking and lending decisions. The asset price channel refers to how monetary policy stance affects prices in the stock, bond, derivative, real estate, and exchange rate markets. The risk-taking channel refers to how relatively low levels of interest rates may induce financial imbalances as a result of reductions in risk aversion and a more intensive search for yield by banks and other investors. The lending channel refers to how the monetary policy stance could impact credit supply by modifying financial intermediaries' sources of funding.

The first and second chapters advance our understanding on these transmission mechanisms including the quantification of their importance.

The first paper, titled "Does Monetary Policy Affect Bank Lending?: Evidence for Bolivia," was written by Óscar A. Díaz Quevedo and C. Tatiana Rocabado Palomeque from Banco Central de Bolivia. In this chapter they use panel data with generalized methods of moments (GMM) and fixed effects to show that changes in monetary policy, measured by the net balance of monetary regulation bonds, have direct effects over credit supply. In addition, they show that smaller and undercapitalized banks reduce relatively more their lending in response to an increase of monetary bonds.

The second paper, titled "What Microeconomic Banks Data Tell Us about Monetary Policy Transmission and Financial Stability in Guatemala?," was written by José Alfredo Blanco Valdés from the Superintendencia de Bancos de Guatemala and Héctor Augusto Valle from Banco de Guatemala. In this chapter they use a panel data of the 18 banks operating in the financial system to show that there is transmission of monetary policy, which is heterogeneous depending on the liquidity, capitalization and size of banks. The transmission mechanism is weakened by the excess liquidity, the portfolio dollarization, the size of the banks, and the way the reserve requirement is computed.

In addition, there is a need to better understand the interdependence between credit cycles and business cycles and the long-term relation among credit, financial stability, and economic growth. The third paper, titled "The Relation between Credit and Business Cycles in Central America and the Dominican Republic," was written

by Francisco A. Ramírez from the Banco Central de la República Dominicana. In this chapter he uses Granger causality tests and spectral analysis to identify a positive relation between credit and economic activity in Costa Rica, the Dominican Republic, El Salvador, Honduras, Guatemala, and Nicaragua. Except for Guatemala, the author finds that credit precedes the business cycle in all countries, with eight-year cycles for Costa Rica, the Dominican Republic, El Salvador, and Honduras.

Also, understanding the financial intermediaries' leverage cycles and the procyclicality of credit is key to comprehend the dynamics of aggregate credit. The fourth paper, titled "Bank Capital Buffers and Procyclicality in Latin America," was written by Óscar A. Carvalho from CEMLA and Leslie A. Jiménez, while she was also at CEMLA. In this chapter they use information of 456 Latin American and Caribbean banks from 18 countries and a two-step system GMM estimator to analyze the determinants of banks' capital buffers. GDP growth is negatively related to capital buffers giving evidence that banks reduce their capital buffers during economic expansions. Bank's size is also negatively related to capital buffers, while profitability, expected losses, and market power are positively related.

2. How Should the Monetary Authority Incorporate Financial Stability Considerations?

With the global financial crisis, a consensus emerged among world's central bankers about the importance of including financial stability considerations when making monetary policy decisions. This led to a lively discussion on how central banks should contribute to control systemic risk. There were positions that suggest monetary policy should focus on inflation stability, while macroprudential policy addresses financial stability. Others claimed that monetary policy should take into account its broad effects on financial stability. In addition, monetary policy should consider that its effectiveness is affected by the financial cycle. This debate also includes the question of which are the benefits and costs of an integrated framework where the central bank is in charge of implementing macroprudential regulation along with monetary policy, versus an alternative structure where policies are executed by separate institutions.

There are many standing questions on how monetary policy should incorporate financial stability considerations as: 1) how

macroprudential regulation effectiveness can be altered by the stance of monetary policy; 2) how price control credibility could be jeopardized by a central bank's commitment to financial stability; 3) which tools should accompany a financial stability mandate; 4) which are the arbitrage opportunities generated by the joint implementation of different prudential policies; 5) how can macroprudential regulation modify the monetary policy transmission mechanisms; and 6) how both types of policies interact in normal times and in times of financial stress.

The fifth chapter of this book, titled "Targeting Long-Term Rates in a Model with Financial Frictions and Regime Switching", a collaborative work by Alberto Ortiz Bolaños and Sebastián Cadavid Sánchez from CEMLA and Gerardo Kattan Rodríguez from Tecnológico de Monterrey, try to provide some answers to these questions. The authors use measures of the term premium calculated by Adrian, Crump, and Moench² to perform Bayesian estimations of a Markov-switching vector autoregression (MS-VAR) model and a Markov-switching dynamic stochastic general equilibrium (MS-DSGE) macroeconomic model with financial frictions in long-term debt instruments developed by Carlstrom, Fuerst, and Paustian (2017)³ to provide evidence on how financial conditions have evolved in the USA since 1962 and how the Federal Reserve has responded to the evolution of term premiums. Using the estimated model, they perform counterfactual analysis of the potential evolution of macroeconomic and financial variables under alternative financial conditions and monetary policy responses. They analyze six episodes with presence of high financial frictions and/or medium and high shocks volatility. In three of them there was a high monetary policy response to financial factors: 1978Q4-1983Q4 which helped to mitigate inflation at the cost of economic activity, and the 1990Q2-1993Q4 and 2010Q1-2011Q4 episodes in which the high response served to mitigate economic contractions. Meanwhile, in the three

² Tobias Adrian, Richard K. Crump, and Emanuel Moench, "Pricing the Term Structure with Linear Regressions," *Journal of Financial Economics*, Vol. 110, Issue 1, October, pp. 110-138, 2013, <<https://doi.org/10.1016/j.jfineco.2013.04.009>>.

³ Charles T. Carlstrom, Timothy S. Fuerst, and Matthias Paustia, "Targeting Long Rates in a Model with Segmented Markets," *American Economic Journal: Macroeconomics*, Vol. 9, No. 1, January, 2017, pp. 205-242.

episodes where low response to financial factors is observed, if the monetary authority had responded more aggressively, from 1971Q1-1978Q3 it could have attained lower inflation at the cost of lower GDP, from 2000Q4-2004Q4 it could have delayed the GDP contraction to 2002Q3, but this would have been deeper and inflation larger, and in 2006Q1-2009Q4 it might have precipitated the GDP contraction. The presence of high financial frictions and high shock volatility makes recessions deeper and recoveries more sluggish showing the importance of the financial-macroeconomic nexus.

3. How Does International Financial Integration Constrain Monetary Policy and Prudential Regulatory Policies?

The process of financial integration has been speeding up and creating interlinkages within Latin America and the Caribbean and between the region and the rest of the world. One goal of this joint research was to understand and measure the mechanisms through which these interlinkages impact domestic financial variables.

The sixth paper, titled “Two Models of FX Interventions: The Cases of Brazil and Mexico,” was written by Martín Tobal and Renato Yslas from Banco de México. In this chapter they use a VAR with short-run restrictions to empirically compare the effectiveness of FX interventions in Brazil and Mexico under inflation targeting regime. Brazil has a model of regular discretionary interventions with a net dollar purchase bias, while Mexico has a model of sporadic rule-based interventions with a net dollar sell bias. The authors show that: 1) FX interventions have had a short-lived effect in both countries; 2) the Brazilian model entails higher inflationary costs; and 3) in response to a FX intervention shock, Banco de México raises the interest rate immediately, while the Banco Central do Brasil response appears with a four-month lag.

The seventh paper, titled “Realized Volatility as an Instrument to Official Intervention,” was written by João Barata R. B. Barroso from Banco Central do Brasil. In this chapter he proposes a novel orthogonality condition based on realized volatility to perform parametric and nonparametric instrumental variable estimations of the effects of FX interventions. By exploiting the information of full records of BRL/USD spot transactions intermediated by the financial institutions and the actual spot intervention policy of the Banco Central do Brasil, he shows that the average effect of a one

billion dollars sell (buy) intervention is close to 0.51% depreciation (appreciation). In addition, he shows that the estimates are robust to nonlinear interactions, with 0.48% depreciation for dollar buy intervention and 0.57% appreciation for dollar sell intervention. Also, he presents evidence in the 0.31% to 0.38% range when controlling for derivative operations.

There are many remaining topics to be understood in the relation between monetary policy and financial stability. We hope that these initial studies focused on Latin America will contribute to advance our understanding and will help central banks to fulfill their price stability mandate while they continue to include financial stability considerations.

