

Introduction

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The guiding theme of the chapters in this part of the book is that the procyclicality of the financial system provides an organizing framework for selecting indicators of vulnerability to crises, especially those that are associated with banks and financial intermediaries.

In addressing the procyclicality of the financial system, it is useful to distinguish between the core and non-core liabilities of the banking sector. Core liabilities can be defined as the funding that the bank draws on during normal times and that is (mainly) sourced domestically.

When banking sector assets are growing rapidly, the core funding available to the banking sector is likely to be insufficient to finance the rapid growth in new lending. This is because retail deposits grow in line with the aggregate wealth of the household sector. In a lending boom when credit is growing very rapidly, the pool of retail deposits is not likely to be sufficient to fund the increase in bank credit, and other sources of funding must then be tapped. The state of the financial cycle is thus reflected in the composition of bank liabilities.

The exact dividing line between core and non-core liabilities will depend very much on the financial system in question and the degree of openness and level of development of financial markets and institutions. For a developed financial system, as in the United States (US) and western Europe, the distinction between core and non-core liabilities seems reasonably well captured by the distinction between deposit versus non-deposit funding.

For emerging and developing economies, more thought is needed in finding a useful classification system between core and non-core liabilities. In an emerging economy where the banking system is open to funding from global banks, rapid increases in the non-core liabilities of the banking system would show up as capital inflows through increased foreign exchange-denominated liabilities of the banking system. For this reason, foreign exchange-denominated liabilities of the banking sector can be expected to play a key role in diagnosing the potential for financial instability.

Hahm et al. in Chapter 2, which is based on Hahm et al. (2013a), examine

the procyclicality of the financial system in Asia by investigating the degree of procyclicality in several Asian countries. There are two strands to the investigation. First, Hahm et al. investigate the (semi-) elasticity of the liability aggregate with respect to changes in gross domestic product (GDP) as a measure of procyclicality. This is accomplished by regressing the log of bank liabilities on the log of real GDP and short-term interest rates. The countries examined are the Republic of Korea, Indonesia, Malaysia, the Philippines, Singapore, and Thailand. The investigation also examines the sensitivity of the liability aggregate to the funding cost faced in the wholesale funding market, as measured by the US federal funds target rate. (Bruno and Shin 2012b have separately investigated the ‘risk-taking channel’ of monetary policy and how such a channel impacts capital flows.)

The second strand of the empirical investigation is to examine the responsiveness of core and non-core bank liabilities to global liquidity and measures of the market price of risk, such as the VIX, the index of implied volatility of Standard and Poors (S&P) 500 options, as well as to measures of cross-border banking activity as measured by the interoffice assets of foreign banks in the US. Bruno and Shin (2012a) have previously shown that the interoffice assets series provides a timely and informative picture of the role of global banks in driving cross-border capital flows.

The main findings by Hahm et al., in Chapter 2, confirm that bank liabilities in Asian countries are highly procyclical as indicated by the significantly positive real GDP elasticities, although the degree of procyclicality varies across countries. In countries with relatively high real GDP elasticities, such as the Republic of Korea and Indonesia, non-core liabilities are more procyclical than core liabilities. Also, non-core liabilities, such as foreign borrowings, tend to be more procyclical in the boom period.

With respect to US monetary policy, Hahm et al. find that bank liabilities are responsive to both domestic and the US policy interest rates, but there are some differences across the countries studied. In the Republic of Korea and Singapore, bank liabilities tend to increase faster when US federal funds rates are low, which indicates that US monetary policy has important spillover effects on bank leverages in emerging Asian countries.

With regard to the impact of the interoffice assets of foreign banks in the US, Hahm et al. find that bank liabilities in many Asian countries respond positively to US cross-border interoffice loans and the elasticities are higher for non-core liabilities. The impact of global market uncertainty, as measured by the VIX, seems less significant in Asian countries, and in many cases, the elasticity has an opposite sign.

In Chapter 3 (originally Hahm et al. 2013b), the authors provide an empirical framework for assessing the vulnerability of an economy to a

financial crisis. Following the same methodology used in 2011, Hahm et al. conduct a panel probit study of the susceptibility of emerging and developing economies to a financial crisis using the non-core bank liabilities as the conditioning variable. However, this new study differs from Hahm et al. (2011) in two respects. First, it focuses on the role of capital market openness in driving the relationship between non-core bank liabilities and financial crises. As most Asian countries have not completely opened their capital markets, examining how capital market openness affects the extent to which non-core liabilities increase the likelihood of currency and credit crises should yield important policy implications. In this chapter Hahm et al. adopt two measures of capital markets openness: (1) a *de jure* Chinn–Ito index based on International Monetary Fund (IMF) classifications, and (2) a *de facto* Lane and Milesi-Ferretti index based on actual financial transactions.

The second strand of the investigation in Chapter 3 explores how global financial conditions impact the level of vulnerability to currency and credit crises. As experienced in two previous crisis episodes in 1997–98 and 2007–08, Asian countries suffer from financial crises when their economic fundamentals deteriorate and when global financial conditions are aggravated. Hahm et al. employ two measures of global financial conditions – US cross-border interoffice loans and the VIX index of implied volatility – and analyze their relationship with the likelihood of a crisis.

The main findings in Chapter 3 are as follows. First, the non-core bank liability ratio has significant predictive power for both currency and credit crises even after the degree of capital market openness is controlled.

Second, between the two openness measures, the *de facto* Milesi-Ferretti index seems to have a superior explanatory power than the *de jure* Chinn–Ito index, which suggests that actual openness could differ widely from regulatory and institutional openness.

Third, capital market openness seems to have a significant impact on the level of vulnerability to financial crises, not only independently but also by interacting non-linearly with non-core bank liabilities.

Fourth, the interaction effect between capital market openness and the non-core liability ratio seems to materialize heterogeneously across currency and credit crises. For a currency crisis, while capital market openness itself tends to increase vulnerability to a crisis, the interaction term with the non-core liability ratio turns out to be negative. Hence, an increase in the non-core liability ratio raises the likelihood of a currency crisis less proportionately when capital markets are more open. However, for a credit crisis, the interaction term is positive in many cases, indicating that with more open capital markets, an increase in the non-core liability ratio raises the likelihood of a credit crisis even more proportionately.

Fifth, as conjectured, global financial conditions exert a significant impact on the crisis incidence. A higher VIX of market risk significantly raises the crisis incidence of emerging market countries for both currency and credit crises. However, it is worth noting that US interoffice loans have heterogeneous impacts on currency and credit crises. An increase in cross-border bank capital flows from the US raises the likelihood of a currency crisis, while it reduces the likelihood of a credit crisis.

Overall results are consistent with the hypothesis that non-core bank liabilities matter more in open emerging market countries than in relatively closed economies. However, the impacts of non-core liabilities materializes in highly non-linear and heterogeneous ways across different crises episodes. Policymakers in emerging Asian economies must therefore take these complex interaction effects into consideration when they pursue capital market opening by designing a careful macro-prudential policy framework as a guard against potential risks.

The discussion so far is appropriate for an economy such as the Republic of Korea's where the domestic banking sector has access to funding from the global banking system. However, in some financial systems that are at an earlier stage of development, or where the banking sector is restricted by regulation from having access to the global banking system, the distinction between the core and non-core liabilities of the banking system will look different, although the same principles from the system-wide accounting framework will continue to apply.

When the domestic banking sector is mostly closed from the global banking sector, deposits will constitute the lion's share of banking sector liabilities. At the same time, traditional monetary aggregates such as M2 become highly variable and procyclical, encompassing volatile banking liabilities. In such instances it may be more meaningful to decompose M2 into its core and non-core components. The non-core component may include the deposits of non-financial companies that end up recycling funding within the economy and hence become integrated into the intermediary sector itself. The People's Republic of China (PRC) and India are two examples of where this distinction between core and non-core liabilities may be usefully employed. In both cases, foreign exchange-denominated bank liabilities or market-based funding instruments play a much smaller role than in a more open economy such as the Republic of Korea.

In Chapter 4, Shin and Zhao provide a firm-level analysis of the role of non-financial corporates acting as surrogate financial intermediaries. The focus of analysis is mainly on non-financial corporates in the PRC, but comparisons are also made with non-financial corporates in other Asian economies.

The investigation centers on the key prediction that non-financial firms

borrow from financial markets in order to hold financial assets, in particular deposits in the banking system. Shin and Zhao explore this hypothesis by examining the correlation between the financial liabilities and cash holdings of non-financial firms. They examine the variation of the correlation between financial liabilities and cash holdings – across countries, industries, and periods – using firm-level data in the Compustat Global datasets for seven economies: the PRC; Japan; the Republic of Korea; and the four largest economies in the Association of Southeast Asian Nations (ASEAN), which are Indonesia, Malaysia, the Philippines, and Thailand.

The main findings are as follows. First, among Chinese firms, financial liabilities and cash holdings are positively correlated when both are divided by sales, which is different from Opler's (1999) findings for US firms. Second, firms in the manufacturing sector display a notably larger intermediary activity. This finding is strongest for the PRC, Japan, and Indonesia. Third, when the sample period for the PRC is divided into three sub-periods (1991–2001, 2002–07, and 2008–11) and the sample period for Japan is divided into two sub-periods (1987–90 and 1991–2011), the interaction between the manufacturing dummy and financial liabilities is positive and significant only in 2002–07 and 2008–11 for the PRC and in 1987–90 for Japan, while being insignificant in all other sub-periods. These findings are hard to reconcile with the financing hierarchy theory, but are consistent with the theory of Hattori et al. (2009).

The results in Shin and Zhao's chapter point to a broader theme of the 'financialization' of non-financial companies. Non-financial firms have taken on attributes of financial firms as they increase the size of their balance sheets relative to their activities in generating sales. As a consequence, they contribute to the amplification of financial cycles.

As monetary policy moves from the role of banks to the functioning of bond markets and the availability of credit to borrowers from long-term investors, such as asset managers that act on behalf of pension funds and insurance companies, the role of non-financial firms will take on increased significance. The findings by Shin and Zhao in Chapter 4 should contribute to a better understanding of the channels through which global liquidity conditions are transmitted to the domestic financial system.

Azis and Yarcia (in Chapter 5) focus on the nature and implications of the dramatic shift in the Asian economy since the 1997–98 financial crisis, which has seen excess investments turn into excess savings. The chapter begins with a discussion of the trend of excess savings and capital flows in selected Asian countries by using flow-of-funds (FOF) data, with a particular focus on the 1997–98 Asian financial crisis as a crucial turning point. The chapter then analyzes the implications of the trend on agents' preferences, determines the key contributing factors to changing

preferences among agents, and considers other economy-wide impacts of the trend. In particular, it highlights the potential vulnerabilities associated with macro-financial and socioeconomic risks. The chapter also considers the rapid surge in corporate savings after the 1997–98 crisis and seeks to identify the most important determinants of corporate savings. The chapter extensively analyzes the trend and the characteristics of excess savings with respect to five Asian economies: Indonesia; the Republic of Korea; the Philippines; Taipei, China; and Thailand. The analysis looks at two key time periods: pre-global financial crisis (2000–07) and post-global financial crisis (2008–11). The authors conclude that surpluses usually come from households and deficits from corporations, except in the case of the Philippines where corporations are net savers and the government is a net borrower.

Chapter 5 also examines the extent to which the behaviors of households, firms, and the financial sector have changed in light of the trend of excess savings, particularly since the global financial crisis. Graphical representations are utilized to analyze agents' behavioral patterns, match the flow of the different components of liabilities and assets of each agent based on FOF data, and estimate the trend-line for each period. The analysis carried out led to inferences about the impacts of the abundant liquidity associated with excess savings and capital inflows on agents' behavior, and to the general conclusion that, as expected, agents in each country exhibit different behavior as to what sources of funds they prefer and where they choose to invest excess savings. The authors also look at the shifting trends over time in terms of capital inflows and outflows in Asia and their implications. The focus is on rising levels of capital outflows, outward foreign direct investment (FDI) and equity investment, and capital inflows, which in the midst of excess savings have further enhanced emerging Asia's macro-financial liquidity. The repercussions of foreign events and other contributing factors – including the recession in the US as well as the ultra-easy monetary policies of and growing risks in advanced economies – are also considered. The authors flag the relationship between gross inflows and gross outflows, particularly the almost symmetrical rise of the two in 2002.

This chapter further considers the potential vulnerabilities associated with the macro-financial and socioeconomic risks of growing excess savings and increased capital flows, and focuses on two types of economy-wide risks: macro-financial and socioeconomic. It considers a balancing act of the benefits of increased inflows to recipient countries against the volatile patterns of these inflows, and how procyclicality can lead to a build-up of financial risks and imbalances. The chapter examines both the asset side and the liability side of bank balance sheets to demonstrate

how bank-led flows can cause the risks of a banking crisis to increase, particularly in times of an external shock such as deleveraging by Eurozone banks. The authors then discuss long-term financing accessed through regional bond markets as another type of vulnerability. Finally, Chapter 5 illustrates the socioeconomic risks associated with growing excess savings and increased capital flows, and the implications of those risks, including the worsening of income inequality and the subsequent effect of lowering growth prospects. It shows how the shift toward a greater preference for investing in financial assets can cause a worsening of the already unfavorable conditions of income inequality in Asia as only a very small percentage of the population in each country has access to the rapidly growing financial sector.

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