Chapter 4
Emerging Asia's Noncore Liabilities and Policy Effectiveness

Excess savings and rising capital inflows—especially since the early 2000s—gave Asia ample liquidity with lower borrowing costs. This would spur domestic demand and growth, helping begin the process of rebalancing the region's economic structure. As this happened, the behavior of economic agents—banks, firms, and households—also changed. The preference toward investing in financial assets increased. This added the risks of procyclicality discussed in previous chapters. Based on flow-of-fund analysis, we showed in Chap. 2 that the rise in bank assets in emerging Asia was driven by a surge in noncore liabilities associated with capital inflows. While this raised some concerns over its impact on financial stability, the precise extent and nature of the effect remains to be investigated. To what extent does the rise in noncore bank liabilities threaten Asia's financial stability, and how does it influence the effectiveness of standard monetary policy?

Compared with other emerging markets, Asia's noncore liabilities as a share of total liabilities remain relatively small. But their rapid rise and higher ratio to gross domestic product (GDP) may have reduced the effectiveness of monetary policy. When the policy is overstressed by continuing to raise the interest rates with limited effect on noncore liabilities, we show in this chapter that it can produce unintended side effects such as elevating probabilities of bankruptcy. Hence, making financial stability an additional goal would require an additional policy instrument. As done in the previous chapters, here we continue to argue that an effective macroprudential policy is needed to supplement standard monetary policy.

After analyzing the relative size of noncore bank liabilities, we analyze the emerging comovement between bank credit and noncore liabilities. This is done using a credit model that takes into account the financial structure of lenders and borrowers (credit channel hypothesis). We then test the effectiveness of interest rate policy, followed by its impact on the probability of bankruptcies occurring.

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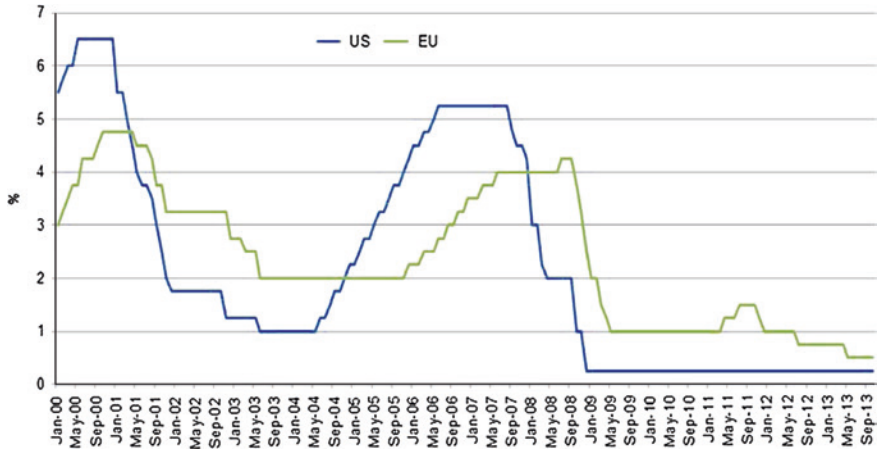

Fig. 4.1 Interest rates—United States (US), Europe. *Source* European Central Bank and US Federal Reserve

4.1 Bank-Led Flows, Noncore Liabilities, and Credit Growth

While push and pull factors work to fuel capital flows, those since early 2000 were driven more by the push factor. United States (US) and Eurozone interest rates fluctuated sharply during the 2000s. After falling precipitously in 2001–2003 in response to the 2000 recession and the 11 September 2001 political shock, the US Federal Funds rate began to rise, increasing more than fivefold by the end of 2007. But the global financial crisis of 2008/2009 dramatically reversed the trend, pushing rates down to as low as 0.25 %. The European interest rates essentially followed the pattern (Fig. 4.1).

Global liquidity conditions have changed since (Fig. 4.2). Massive amounts of capital shifted from advanced economies to emerging markets.[1] Emerging Europe and Asia were among the biggest recipients. This is the first phase of global liquidity. Much of these inflows were intermediated through banks (bank-led flows). As these should appear as bank liabilities, any volatility would likely have ramifications for bank balance sheets—implying the risk of procyclicality. During the 2008/2009 global financial crisis, these flows were briefly interrupted. But after mid-2010, large flows returned. This time they were predominantly channeled through capital

[1] Mckinnon (2012) argued that the easy money policy in advanced economies provokes global monetary instability through capital flows led by "carry traders" who exploit interest rate differentials across countries. He further noted the policy was also less effective than originally thought in generating recovery (e.g., in the US). Azis (2010) also argued that a premature US recovery would unlikely be sustainable. Rather than forcing a quick recovery, structural changes in the US financial system were needed more.

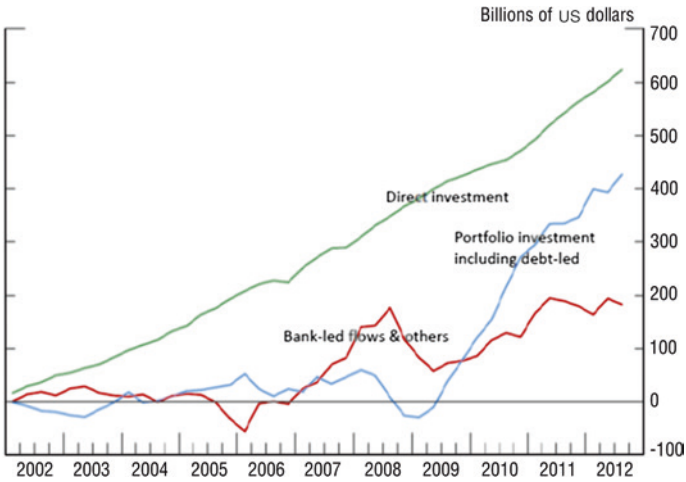

Fig. 4.2 Gross capital flows by type—emerging markets. *Source* Institute of International Finance

markets (debt-led flows), including local currency (LCY) bond markets. The push came from the elevated risk and falling yields in the US following the unprecedented quantitative easing (QE) by the US Federal Reserve (US Fed). QE essentially involves large-scale asset purchase to halt the precipitous fall in asset prices. After adjusted twice, by late December 2012, monthly purchases reached $85 billion (Fig. 4.3). Thus, the second phase of global liquidity began. The nature and protagonist of capital flows changed and so did the impending risks.[2]

How significant is the link between bank-led flows and noncore liabilities? Figure 4.4 summarizes this link for emerging Asia. As the cumulative change (increase) of bank-led flows surged before the global financial crisis, so did noncore bank liabilities. When they dropped off during the crisis, the cumulative change of noncore liabilities also declined, before surging back from 2009 to 2012.[3] The US Fed announcement over the possibility of policy normalization and QE tapering in mid-2013 rattled several emerging Asian markets. Together with the growing expectation that recovery in advanced economies was imminent, it led to capital outflows and another round of volatility. As shown in Fig. 4.4, bank-led flows fell during 2012–2014, causing noncore liabilities to fall as well. Clearly,

[2] As discussed in Chap. 2, debt-led flows and bank-led flows have been the most volatile among all types of capital flows.

[3] We argued in Chap. 3 that the exact dividing line between core and noncore liabilities highly depends on the financial system in question, its degree of openness, and financial market and institutional development. Retail household deposits would be a good first conjecture in defining core liabilities. Given data limitations, however, here we define noncore liabilities based on the claim holder, or meaning the total liabilities less retail/household deposits.

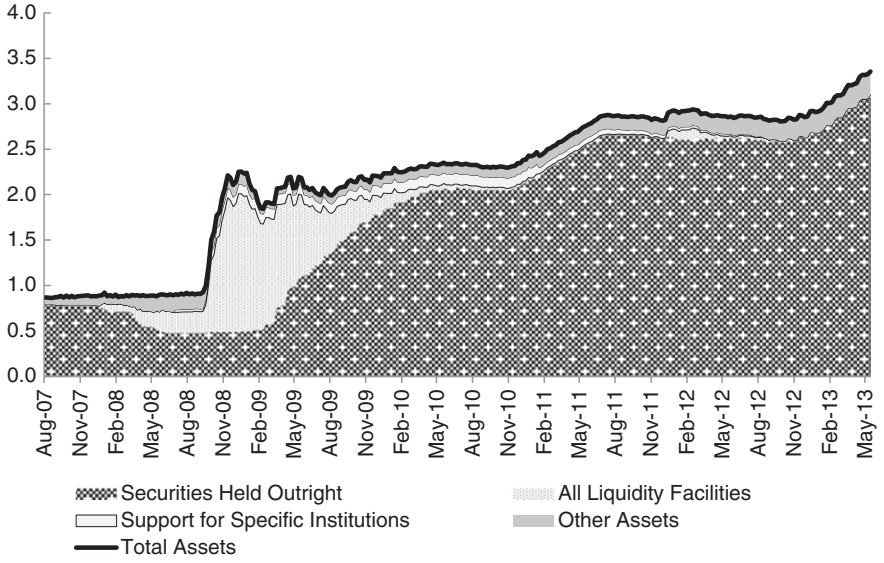

Fig. 4.3 Quantitative easing—United States Federal Reserve Assets Outstanding ($ trillion). *Source* US Federal Reserve

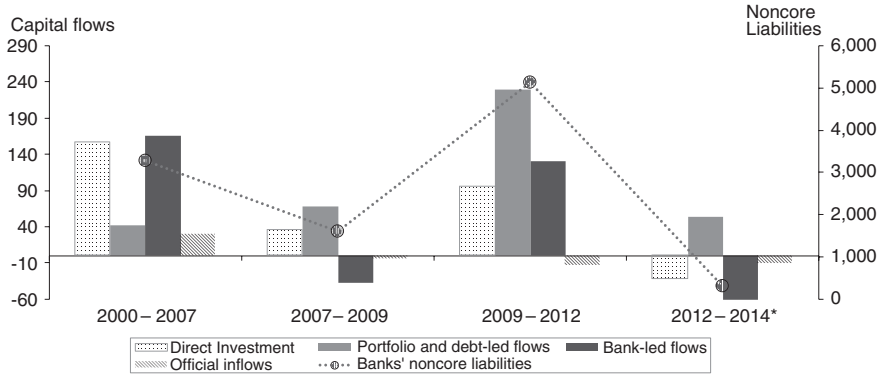

Fig. 4.4 Capital inflows and noncore liabilities—emerging Asia (cumulative change, $ billion). *Asterisk* (*) figures are IIF estimate (2013) and IIF forecast (2014). *Notes* Emerging Asia refers to China, People's Republic of; India; Indonesia; the Republic of Korea; Malaysia; the Philippines; and Thailand. Noncore liabilities data do not include India and the Philippines. **Bank-led flows** = Net disbursements from commercial banks (excluding credits guaranteed or insured under credit programs of creditor governments). This generally includes bond purchases by commercial banks. **Portfolio and debt-led flows** = Equity investment and net external financing provided by all other private creditors. The latter includes flows from nonbank sources into bond markets, as well as deposits in local banks by nonresidents other than banks. It also includes credit by suppliers (excluding credits guaranteed or insured under credit program of creditor governments), identified private placements of debt securities, and other financial securities issued in local or foreign currencies. Finally, it includes estimated interest payments due but not paid and estimated payments flows with private creditors other than commercial banks resulting from discounted debt transactions. *Source* IIF and national sources

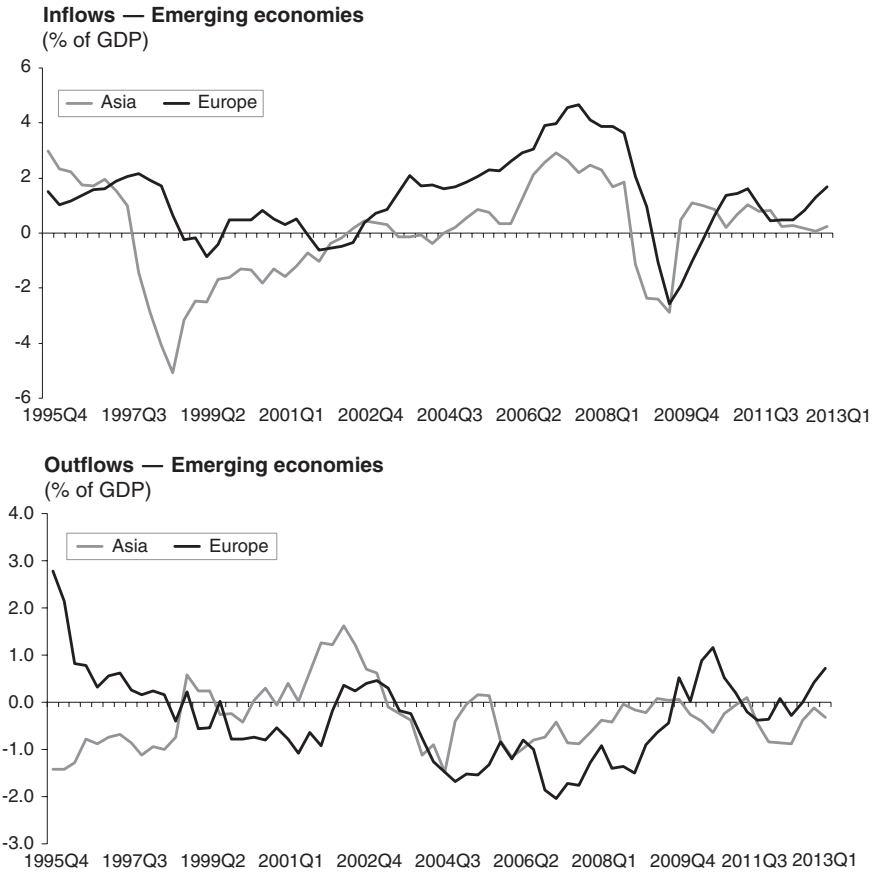

Fig. 4.5 Bank flows to emerging economies (% of GDP). *Notes* Asia includes Indonesia, the Republic of Korea, the Philippines, and Thailand. Europe includes Bulgaria, Croatia, Czech Republic, Hungary, Latvia, Poland, Russia, Turkey, and Ukraine. *Source* ADB calculations using data from CEIC

bank-led flows have been the major driver behind the increase in noncore liabilities during that period (see Appendix for the impact on individual economies).[4]

To gain a better perspective on the size of bank-led flows, we compare the case of emerging Asia with that of emerging Europe (Fig. 4.5).[5] Prior to the 1997/1998

[4] Note that Fig. 4.4 also confirms the different phases of capital flows in emerging Asia, where bank-led flows dominate phase 1 and portfolio and debt-led flows dominate phase 2.

[5] Emerging Europe includes Bulgaria; Croatia; Czech Republic; Hungary; Latvia; Poland; the Russian Federation; Turkey; and Ukraine.

Table 4.1 Episodes of capital flows—selected emerging economies

Led by	Emerging Europe	Emerging Asia
Gross inflows		
Surge		
Bank flows	• 2005Q2-Q3 • 2006Q4-2007Q3 • 2010Q3-Q4 • 2012Q4-2013Q1	• 2009Q4-2010Q2
Debt flows	• 1997Q3-1998Q1 • 2002Q3-Q4 • 2004Q2-Q4	• 2002Q1-Q3
Equity flows	–	• 1999Q2-Q3
FDI flows	–	–
Stop		
Bank flows	• 2008Q4-2009Q3 • 2012Q1-Q2	• 1997Q4-1998Q2 • 2008Q4-2009Q1
Debt flows	• 1998Q4-1999Q2	• 1997Q1-Q3 • 2001Q1-Q3
Equity flows	–	• 2006Q4-2007Q1 • 2008Q1-Q3 • 2011Q3-Q4
FDI flows	–	–
Gross outflows		
Retrenchment		
Bank flows	• 2002Q1-Q2 • 2005Q3-Q4 • 2009Q1-Q4 • 2012Q3-2013Q1	• 1996Q4-1997Q1 • 1998Q3-Q4 • 2002Q1-Q2 • 2004Q4-2005Q2
Debt flows	–	• 1998Q1-Q2
Equity flows	–	• 2008Q2-2009Q1
FDI flows	–	–
Flight		
Bank flows	• 1996Q3-Q4 • 2004Q1-Q2 • 2011Q2-Q3	• 2002Q4-2003Q2 • 2006Q1-Q2
Debt flows	–	• 2009Q4-2010Q2
Equity flows	–	• 2007Q2-Q4
FDI flows	• 2003Q2-Q4 • 2007Q1-Q3	–

FDI foreign direct investment

Notes

1. Emerging Europe refers to Bulgaria, Croatia, Czech Republic, Hungary, Latvia, Poland, Russia, Turkey, and Ukraine. Emerging Asia refers to Indonesia, the Republic of Korea, the Philippines, and Thailand
2. Episodes are based on 1 standard deviation (SD) band of gross capital inflows and outflows
3. Surge episode = if the year-on-year level change of gross inflows (based on a 4-quarter moving sum) increases more than 1 SD above its rolling 8-quarter mean. Stop = if the year-on-year level change of gross inflows (based on a 4-quarter moving sum) falls 1 SD below its rolling 8-quarter mean. Retrenchment = year-on-year level change of gross outflows (based on a 4-quarter moving sum) increases more than 1 SD above its rolling 8-quarter mean. Flight = if the year-on-year level change of gross outflows (based on a 4-quarter moving sum) falls 1 SD below its rolling 8-quarter mean

Source Authors' calculations

Asian financial crisis, the size of bank-led inflows as a percentage of GDP was larger in Asia than in Europe. Afterward—until 2002—flows in emerging Europe fluctuated only slightly, while those in Asia fell precipitously. Until a few years prior to the global financial crisis, emerging Europe's share was persistently higher than Asia's. The trend in bank-led outflows was generally similar. But the peak in both regions occurred at about the same time, just before the global financial crisis—coinciding with the fall in interest rates in the US and Europe.

As in Asia, volatility in emerging Europe has been also highest for bank-led and debt-led flows (Table 4.1). A closer look reveals that the occurrence of "surge" of both types of flows occurred more frequently in emerging Europe than in emerging Asia.

To the extent both emerging Europe and Asia are highly bank dependent, significant volatility in noncore liabilities could pose a serious procyclicality risk. This would not happen, however, if the size of noncore liabilities is small, and more importantly, if bank assets are not deeply affected by the growth and relative change in noncore liabilities. To determine size, we first compare noncore liabilities in Asia with those in emerging Europe. Noncore liabilities in Asia—measured as percentage to GDP—have been on an upward trend since the Asian financial crisis (Fig. 4.6). But they are smaller than in emerging Europe. Much of the reason is because there was a jump in noncore liabilities in Europe driven by increased bank-led flows as discussed in Chap. 2. Broken down by economy, by 2012, only Hong Kong, China; Singapore; and the Republic of Korea had a higher share of noncore liabilities than most of emerging Europe (Fig. 4.7). However, measured by the ratio of noncore liabilities to total liabilities, Asia's share of noncore liabilities is relatively high (Fig. 4.8). It ranged from around 40 % (in Indonesia) to over 50 % (in the Republic of Korea).

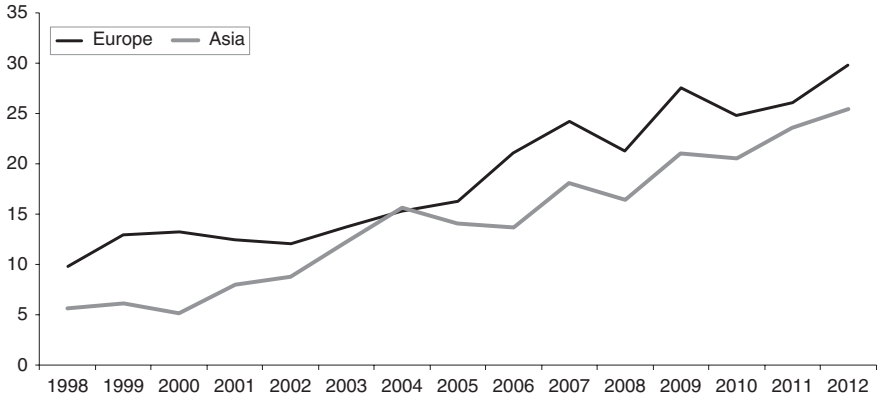

Fig. 4.6 Noncore bank liabilities—emerging economies (% of gross domestic product). *Notes* Asia includes People's Republic of China; Hong Kong, China; Indonesia; Malaysia; the Philippines; the Republic of Korea; Singapore; Taipei,China; and Thailand. Europe includes Bulgaria, Croatia, Czech Republic, Hungary, Latvia, Poland, Russia, Turkey, and Ukraine. *Source* ADB calculations using data from CEIC

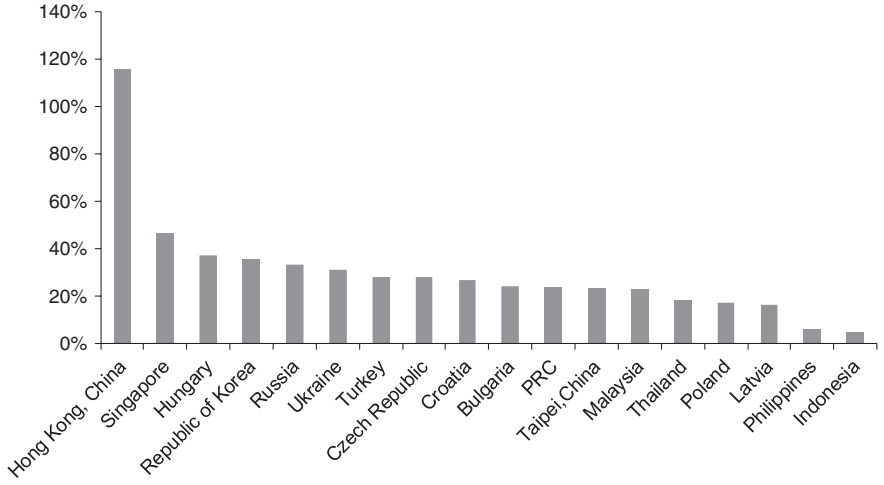

Fig. 4.7 Noncore bank liabilities—selected emerging economies (% of gross domestic product, 2012). *PRC* People's Republic of China. *Source* ADB calculations using data from Bankscope

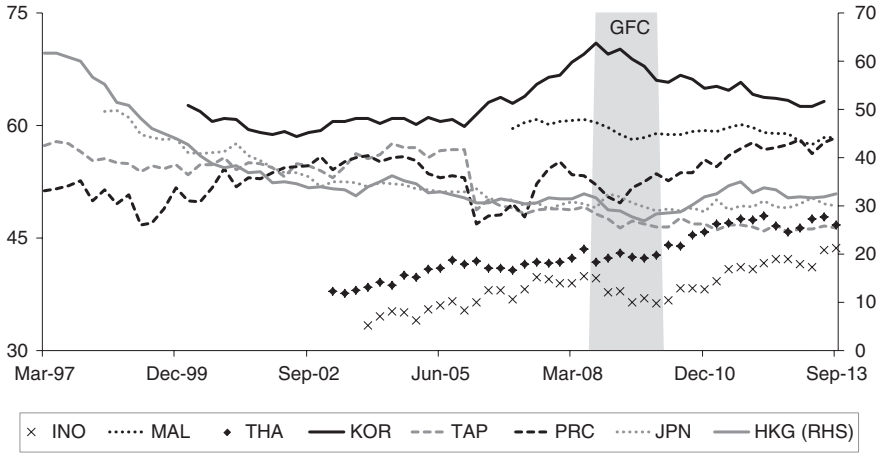

Fig. 4.8 Noncore bank liabilities—emerging Asia (% of total liabilities). *PRC* People's Republic of China; *HKG* Hong Kong, China; *INO* Indonesia; *JPN* Japan; *KOR* Republic of Korea; *MAL* Malaysia; *TAP* Taipei,China; *THA* Thailand. *Note* Noncore liabilities = Total liabilities less retail/household/individual deposits and shareholders' equity. *GFC* global financial crisis (September 2008–December 2009). *Source* ADB calculations using data from CEIC

To examine whether increases in noncore liabilities mirror increases in total assets, we plot the changes in bank assets against changes in noncore and core liabilities (Fig. 4.9). The slope of noncore liabilities is higher than that of core liabilities in all economies. This is consistent with the analysis based on the

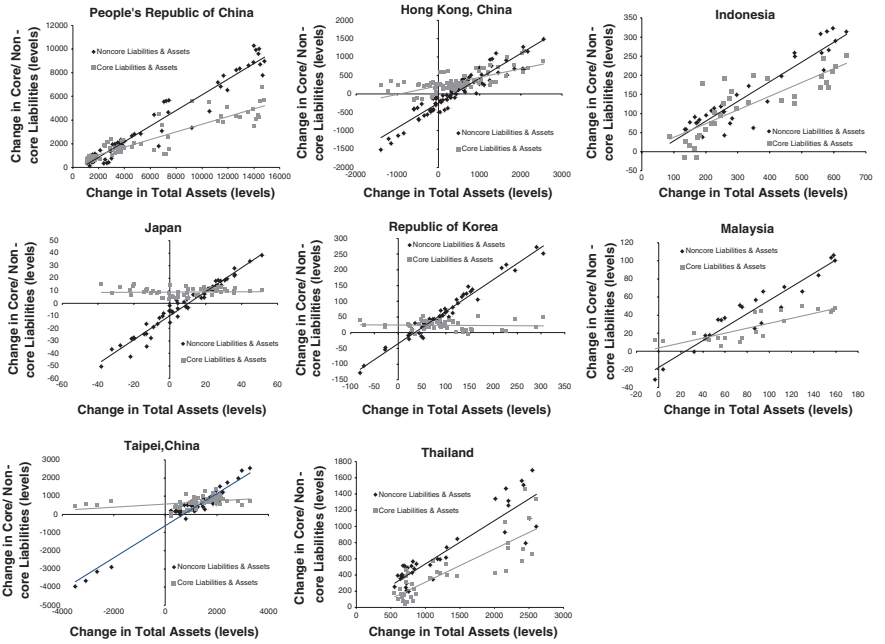

Fig. 4.9 Changes in core and noncore liabilities versus changes in total assets (year-on-year change in quarterly levels). *Source* Authors' calculations

Flow-of-Fund data in Chap. 2, although here we use the information directly obtained from the banking sector with greater detail and more complete data. It suggests that the growth in bank assets move more closely with changes in noncore liabilities than with changes in core liabilities, confirming the former's increasing importance in bank decisions to expand. Based on the current size of noncore liabilities, however, the risk of procyclicality in emerging Asia is not yet large. However, given their rising trend and high ratio to total liabilities, policy-makers and regulators should monitor developments closely. If left unattended, they could reach a level that could threaten macroeconomic and financial stability.

How did banks allocate spending and investment given their rise in assets? It has been shown that bank preference toward investing in risky financial assets increased along with the increase in noncore liabilities (Azis and Yarcia 2014). Holding financial assets such as bonds and other securities remain high on bank balance sheets. At least 50 % of total bank assets are classified as risky. As depicted in Fig. 4.10, the increase in risky assets as a percentage of total assets after the global financial crisis is noticeable in some economies (Indonesia, Malaysia, and Thailand). Yet, bank credits remain dominant (Fig. 4.11). In emerging Asia (except Singapore), loans or bank credits hold the largest share of bank assets. And they are all rising, albeit at different speeds.

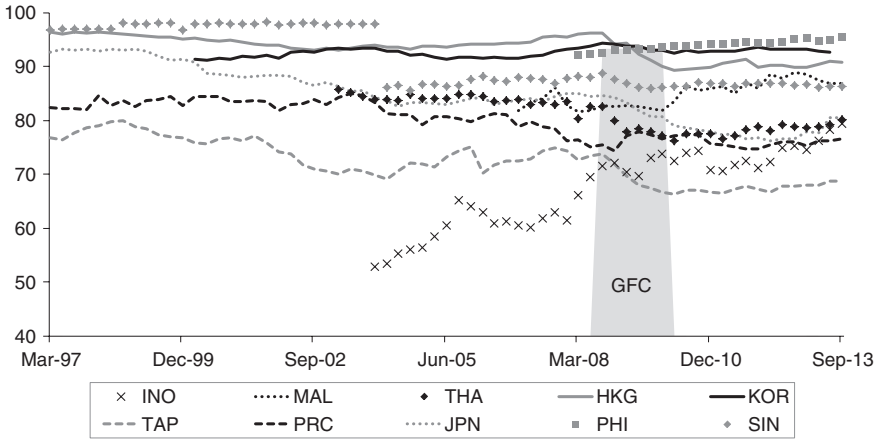

Fig. 4.10 Risky bank assets (% of total assets). *PRC* People's Republic of China; *HKG* Hong Kong, China; *INO* Indonesia; *JPN* Japan; *KOR* Republic of Korea; *PHI* Philippines; *MAL* Malaysia; *SIN* Singapore; *TAP* Taipei,China; *THA* Thailand. *Note* Risky assets = Total assets less cash, government bonds and fixed assets. *GFC* global financial crisis (September 2008–December 2009). *Source* ADB calculations using data from CEIC

But two variables moving in the same direction (credits and noncore liabilities) do not necessarily imply causality. To explore further, we construct a credit regression model with the usual control variables (Table 4.2). In Model-1, the growth of the economy, interest rates and bank net worth (to capture banks financial health) all determine credit growth. The coefficients are all significant. Controlling for these variables, changes in noncore liabilities turn out to be the most significant over the period. To the extent government bonds in these economies have been growing steadily and provide an alternative source of long-term financing, we include changes in bond yields in Model-3. The notion that earnings from higher bond yields may "crowd out" credit is tested. While the added variable has the expected sign, however, it is insignificant. More importantly, changes in noncore liabilities remain the most significant variable.

In modeling credit growth, it has been also hypothesized that credit growth is not only determined by the size of a bank's available funds, but also by changes in net worth and external finance premiums of both borrowers and lenders. This "credit channel" hypothesis was first postulated by Bernanke et al. (1996) and elaborated further in Stiglitz and Greenwald (2003), Stiglitz (2001), among others.

Why does a borrower's balance sheet matter? When firms act as lenders to other firms, credit market friction will likely amplify, propagating real and nominal shocks to the economy (Stiglitz and Greenwald 2003). In a principal–agent problem, credit and investment cycles can be affected in several ways. A depressed collateral value of the firm due to falling asset prices, or a worsening balance sheet caused by a double mismatch in the firm's leverage, can raise the agency costs

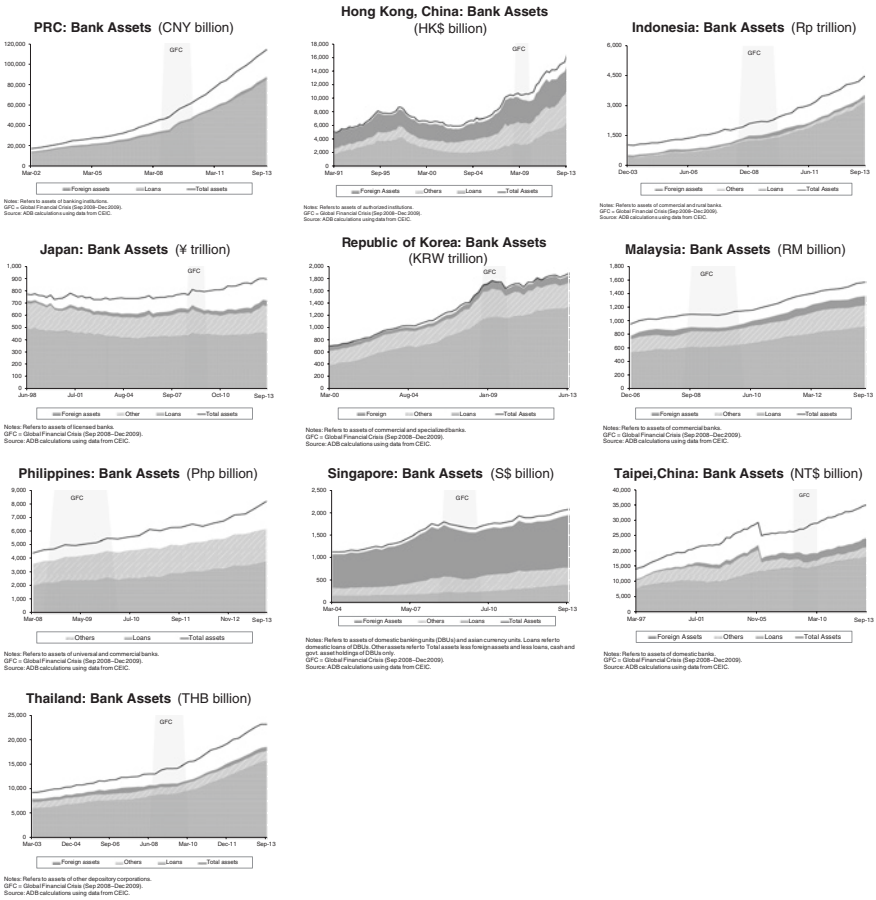

Fig. 4.11 Trends in bank assets—selected Asian economies

imposed by asymmetric information between borrowers and lenders.[6] In these circumstances, there is an incentive for borrowers to pass off risky or potentially bad projects as good projects to lenders. This can lower the probability that the loan will be repaid, or raise the probability that the firm will go bankrupt. While the causality between interest rates and bankruptcies can work both ways, it will nonetheless lead to higher costs of external finance (e.g., in higher interest rates).[7]

[6] Stiglitz and Weiss (1981) demonstrate the effect of lenders' inability to distinguish between different types of borrowers on credit restrictions through the agency cost. Williamson (1987) shows that even if lenders know the risk characteristics of different borrowers, there is an incentive for lenders to verify borrower claims and monitor the project, raising costs that can lead to credit rationing.

[7] The cost difference between external finance and internally generated finance is a measure of agency cost, which likely increases during recessions and decreases during booms.

Table 4.2 Regression results on credit growth

Dependent variable	Independent variable (expected sign)
Credit growth	Change in:
	1. GDP growth (+)
	2. Bank net worth (+)
	3. Nominal interest rates (−)
	4. Noncore liabilities (+)
	5. Corporate net worth (+)
	6. Share of government bond holdings (−)
	7. Government bond yields (−)

Panel regression results (Credit growth = Y)			
Independent variables	Model-1	Model-2	Model-3
GDP growth	0.065**	0.0826**	0.026
	(1.97)	(2.26)	(0.84)
Change in banks' net worth$_{t-1}$	0.042**	0.049**	0.054***
	(2.15)	(2.24)	(2.95)
Change in nominal interest rates$_{t-1}$	−0.728***	−0.976***	−1.348***
	(−2.62)	(−3.12)	(−4.10)
Change in noncore liabilities$_{t-1}$	0.536***	0.635***	0.384***
	(18.74)	(20.65)	(11.3)
Change in corporate net worth$_{t-1}$	–	0.018	–
	–	(0.72)	–
Change in share of government bond holdings$_{t-1}$	–	−0.008	–
	–	(−0.48)	–
Change in government bond yields	–	–	−0.002
	–	–	(−0.39)
Constant	0.042***	0.029***	0.062***
	(5.42)	(7.32)	(9.09)
R-squared			
Within	0.484	0.484	0.294
Between	0.897	0.901	0.920
Overall	0.613	0.613	0.551

GDP = gross domestic product
Note z-values in parenthesis
***Significant at 1 %
**Significant at 5 %
*Significant at 10 %
Source Authors' calculations

Why does the financial structure of lenders matter? If a bank holds large amounts of nonliquid assets (government bonds) and a considerable number of nonperforming loans (higher defaults), then the collateral of financial intermediaries will likely fall. This forces lenders to undertake portfolio reallocations that may result in credit rationing. In this situation, at any given interest rate, fewer funds or credits are available.

Following this hypothesis, in Model-2, we include the net worth of borrowers represented by corporates and changes in the share of bondholdings in total bank assets. The latter is included for two reasons: First, to reduce risks, banks tend to accumulate government bonds to comply with the capital adequacy ratio (CAR) rule; and second, the rising share of government bonds may limit a bank's capacity to lend. As shown in Table 4.2, the two variables have the expected signs, but none are significant. More importantly, the coefficient of noncore liabilities is even higher than in Model-1 and Model-3 (0.635), and it has a higher degree of significance as well. So the result showing that noncore liabilities contribute significantly to bank credit growth is robust.

Expanding bank credit itself can be positive if it is in line with the bank's capacity to lend—based on stable sources and real demand. The problem is more often than not that credit growth tends to be excessive as liquidity becomes abundant, creating a lending boom that could threaten financial stability. Although we argued in Chap. 3 that credit size may not be the best early warning indicator, how credit is allocated remains important as a measure of vulnerability. If a considerable portion of credit goes to nonproductive sectors, the growth of monetary aggregates will not be in sync with what the economy is able to create. Low productivity and high inflation will likely follow this kind of credit growth. Moreover, a surge of bank lending to housing and real estate can also contribute to asset bubbles and propagating financial instability. Data show most emerging Asian economies are experiencing this trend. Measured as a percentage of GDP, housing and real estate loans have been on the rise, with the highest ratio since the onset of the global financial crisis in Singapore and Hong Kong, China (Fig. 4.12).

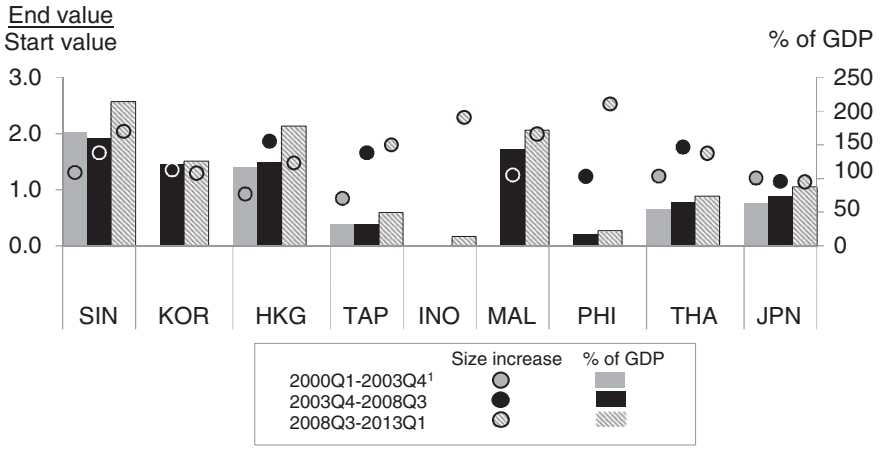

Fig. 4.12 Housing and real estate loans (size increase and % of GDP). *HKG* Hong Kong, China; *INO* Indonesia; *JPN* Japan; *KOR* Republic of Korea; *PHI* Philippines; *MAL* Malaysia; *SIN* Singapore; *TAP* Taipei,China; *THA* Thailand. *GDP* gross domestic product. Note Uses quarterly data. Data unavailable for PRC. Start of data except for INO (2010Q3); JPN (2000Q4); KOR (2005Q4); MAL (2006Q1); and PHI (2008Q2). *Source* ADB calculations using data from CEIC

4.2 Reassessing Monetary Policy

If the growth of noncore liabilities is the reason behind excessive credit expansion, the standard monetary policy of limiting credit growth can be ineffective. A better policy should then entail supervising and managing noncore liabilities. In Chap. 2, we explain that rising noncore liabilities associated with bank-led flows could be highly procyclical and constitute an important transmission channel of global liquidity shocks to emerging Asia. A likely outcome is that financial cycles will fall out of sync with domestic business cycles, meaning the effectiveness of a standard monetary policy can be severely curtailed. Similarly, when portfolio and debt-led flows became dominant (the second phase), nonbank activities can influence monetary aggregates, in which case, a standard monetary policy also tends to be ineffective. The increased preference of economic agents toward risky assets further complicates the policy challenge. It is on this ground we argue that a supplementary macroprudential policy is needed.

In an environment where monetary policy is effective, credit growth that fuels inflation can be controlled by interest rates. With varying degree of success, this has been the approach widely used by monetary authorities. The reality, however, does not seem to support the intended purpose. Our simple test on the effectiveness of interest rate policy to lower the inflation rate in emerging Asia shows a mixed result at best (Table 4.3). The test summary shows that it is the inflation rate that Granger causes the policy rate, not the other way around. This is particularly true in the People's Republic of China; Hong Kong, China; Indonesia; the Republic of Korea; the Philippines; and Viet Nam. And we do not find a significant relationship between the two variables in India, Malaysia, or Thailand.

The limited capacity of monetary policy to prevent an economy from overheating is well known, especially when involving asset and housing prices. But controlling credit growth through monetary policy should have been more

Table 4.3 Summary results on Granger causality between inflation and policy rate

	Sample	VAR lag order (based on AIC selection)	After correcting for nonstationarity	
			Inflation Granger causes policy rate	Policy rate Granger causes inflation rate
PRC	2001.1–2011.7	2	/	/
Hong Kong, China	2001.1–2011.7	1	/	x
Indonesia	2005.6–2011.7	2	Only in lag 1	x
India	2001.1–2011.7	2	x	x
Korea, Rep. of	2001.1–2011.7	2	/	x
Malaysia	2004.4–2011.7	1	x	x
Philippines	2001.1–2011.7	3	/	x
Thailand	2007.7–2011.7	1	x	x
Viet Nam	2001.1–2011.7	2	/	x

straightforward had the financing source for credit been known and influenced by interest rates—bank deposits, for example. Yet, the share of nondeposit and other noncore liabilities to finance credit has been growing, making it more difficult to control. This may explain the ineffectiveness of interest rate policy in containing credit growth and hence inflation. A set of institutional factors may have influenced the transmission of interest rates to inflation rates.

Returning our focus to the effect of monetary policy on noncore liabilities, we run a model that directly relates interest rates with noncore liabilities. Our intention is not to capture the causal relationship of the two variables. Instead, we want to determine how bank liabilities respond to interest rates (proxied by discount or policy rates) in 10 Asian economies. For the reasons described in Chap. 2, different financial institutions may have different capacities of what they can easily absorb on their balance sheets in terms of capital inflows. With a wider global network, foreign banks may have greater access to external financing compared with domestic banks. Furthermore, there may be differences in domestic and foreign bank behavior—as evident in the trend of their noncore liability holdings over the years. Thus, the specified model below is separately applied to domestic banks and foreign banks for 1998–2012.

Ln(noncore liabilities) = Ln(GDP) + policy rate, *where the policy rate variables include the current and the lag.*

If monetary policy is effective, the coefficients of the interest rate variables would be significant and have a negative sign. After controlling for GDP growth, none of the policy rate coefficients—when ran against noncore liabilities—are found significant (Table 4.4). While the GDP coefficients in all cases are significant (and

Table 4.4 Regression results on policy rates and bank liabilities

	Dependent variable			
	Noncore liabilities	Core liabilities	Noncore liabilities	Core liabilities
Independent variables	Domestic banks		Foreign banks	
Ln.GDP growth	0.736***	0.944**	0.446*	0.347**
	(3.05)	(3.77)	(2.14)	(1.87)
Policy $rate_{t-1}$	−0.050	−0.068	−0.058	−0.068
	(−0.64)	(−0.98)	(−0.83)	(−1.12)
Policy $rate_t$	−0.185	−0.268**	−0.085	−0.077
	(−1.40)	(−2.24)	(−0.66)	(−0.69)
Constant	10.289***	10.502***	11.177***	14.087***
	(4.23)	(4.14)	(5.38)	−7.620

Note z-values in parenthesis
***Significant at 1 %
**Significant at 5 %
*Significant at 10 %
Source Authors' calculations

with the correct sign), the policy rates with and without lag—although negative—are not. Additionally, the policy rate coefficients for foreign banks' noncore liabilities are almost zero.

To the extent the effect of monetary policy is more instantaneous than most other aggregate demand policies, the current policy rate (without lag) may be more appropriate to evaluate. Interestingly, in using this rate, the only policy rate coefficient that is significant and with the correct sign is for domestic banks' core liabilities (at the 5 % level). For the rest, the coefficient is either insignificant or very small. The results thereby confirm the limited effectiveness of standard monetary policy in containing the growth of noncore liabilities.

However, the explanations and fundamental reasons for policy ineffectiveness could be easily overlooked. After policy is implemented and the intended goal is not met—whether targeted inflation, the size of noncore liabilities, or credit growth—there is a tendency to even double efforts by tightening monetary policy further. Not only will the goal continue to be unmet—precisely because of the reasons described above—but there is also a risk that the financial health of banks deteriorates due to too tightened monetary conditions. We can look at this issue further by focusing on how policy rates affect bank wealth—the latter measured by the ratio of bank net worth to safe assets.

The following set of explanatory variables is specified. Growth of GDP represents the overall economic activity that should have a positive contribution to bank wealth. Next is bank profitability measured as the difference between lending and discount rates. Higher profitability should augment bank wealth too. Given the role of equity markets in asset valuation, especially the financial sector component of the stock market, a bank's financial condition is also influenced by fluctuations in that market. Improving stock indexes would help improve bank net worth. After controlling for these variables, we then test the role of policy rates in affecting bank wealth. Given a certain level of interest rate, an increase could help improve bank revenues and deposits, thereby augmenting net worth. But when bank loans start to suffer, a further interest rate increase will diminish bank wealth. To capture these dynamics, we include a squared policy rate in the model.

Table 4.5 shows the results. All explanatory variables are significant at least at the 5 % level and have the expected signs. What is interesting is that the coefficient for policy rate is positive and significant at the 1 % level, but for the squared rate, it is negative and also significant at 1 %. This suggests that up to a certain point, raising interest rates will have a positive impact on bank net worth. But continuing to raise rates beyond that point would damage a bank's financial health. If left untreated, the deterioration of net worth could lead to bankruptcy.

Table 4.5 Regression results on policy rates and bankruptcy

	Dependent variable
	Bankruptcy indicator[a]
Independent variables	Full sample
Lending–discount rate gap (e.g., profitability measure)	0.002**
	(2.15)
Change in financial stock index	0.126***
	(5.44)
Policy $rate_t$	0.118***
	(7.77)
Policy rate, squared	−0.007***
	(−4.82)
Change in real GDP	0.056**
	(1.64)
Constant	−0.889**
	(−2.82)
R-squared	
Within	0.2031
Between	0.1687
Overall	0.2458

[a]Calculated as net worth/nonrisky assets
Note z-values in parenthesis
***Significant at 1 %
**Significant at 5 %
*Significant at 10 %
Source Authors' calculations

As potent as monetary policy can be, the increasing role of noncore liabilities in influencing credit clearly points to the need for supplementary measures to make monetary policy more effective. This is where we strongly argue that policy needs to be complemented by macroprudential measures. Designed properly, these measures could also help reduce the risk of financial vulnerability caused by changes in global liquidity.

4.3 Appendix

See Fig. 4.13.

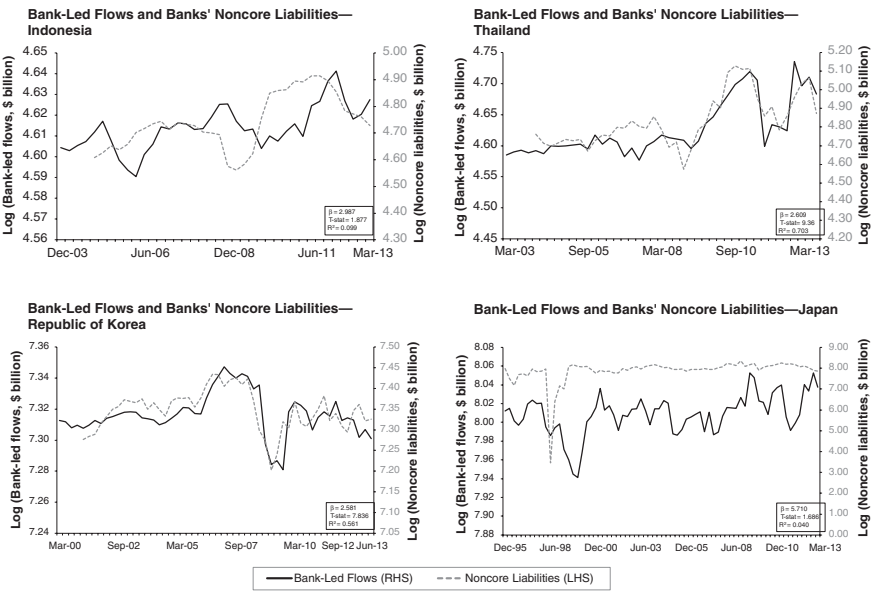

Fig. 4.13 Bank-led flows and noncore liabilities. *Notes* (1) Levels (in USD billion) are log-transformed. (2) Noncore liabilities = Total liabilities less retail/household/individual deposits and shareholders' equity. (3) Regression results are for log-transformed variables (where y = noncore liabilities; x = bank-led flows). *Source* ADB calculations using data from Balance of Payments Statistics, International Monetary Fund; and CEIC

References

Azis IJ (2010) Predicting a recovery date from the economic crisis of 2008. Socio-Econ Plann Sci 44:122–129

Azis IJ, Yarcia D (2014) How capital flows affect economy-wide vulnerability and inequality: flow-of-funds analysis of selected Asian economies. ADB working paper series on regional economic integration 136

Bernanke B, Gertler M, Gilchrist S (1996) The financial accelerator and the flight to quality. Rev Econ Stat 78(1):1–15

Mckinnon R (2012) Zero interest rates in the United States provoke world monetary instability and constrict the US economy. Stanford University SIEPR policy brief

Stiglitz J (2001) Information and the change in the paradigm in economics. Prize lecture, Nobel Foundation, Stockholm

Stiglitz J, Greenwald B (2003) Towards a new paradigm in monetary economics. Cambridge University Press, Cambridge

Stiglitz J, Weiss A (1981) Credit rationing in markets with imperfect information. Am Econ Rev 71(3):393–410

Williamson S (1987) Costly monitoring, loan contracts, and equilibrium credit rationing. Q J Econ 102(1):135–145