of cross-border debt is intermediated through the domestic banking system.[11]

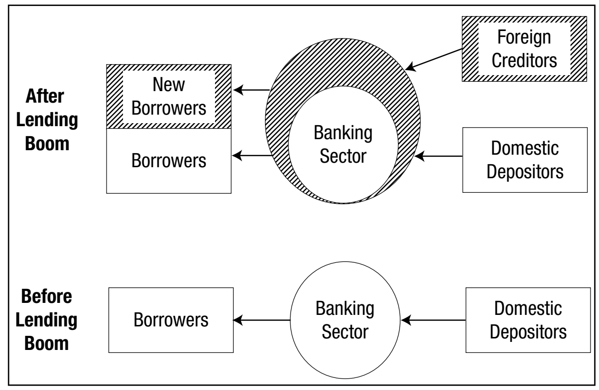
The ability of banks to raise cross-border funding then fluctuates over time in line with prevailing "risk on/risk off" conditions in global credit markets. To illustrate this point, Figure 4 plots banking sector capital flows as revealed in external claims (loans and deposits) of BIS reporting-country banks vis-à-vis several emerging and advanced economies.

The synchronization of banking sector flows across disparate recipient regions is striking, notably in the period ending in 2008. This synchronization suggests the presence of global factors driving cross-border bank-related capital flows in a number of otherwise very different countries.[12]

## Funding Models and Wholesale Funding Markets

The connections between the external liabilities of the banking sector and financial vulnerability can also be viewed from the perspective of balance sheet management. As intermediaries that borrow in order to lend, banks must raise funding to extend credit to borrowers. In an economy with domestic savers, the retail deposits of the household sector are the main source of funding available to banks—the "core liabilities" of banks. However, retail deposits typically grow in line with the size of the economy and the wealth of the household sector, not any faster. When credit is growing faster than the pool of available retail deposits, banks will turn to wholesale funding (their "non-core liabilities") to support credit growth.[13] Short-term wholesale funding from foreign creditor banks is less stable than retail funding, as it is associated with the lending decisions of global banks in international capital markets—the banks whose procyclical behavior we have already commented upon.[14]

**Figure 5: Non-Core banking funding and external liabilities**




*Source: Hahm, Shin and Shin (2011)*

The schematic in Figure 5 depicts the role of external liabilities in financing credit growth in the upswing of the credit cycle. The lower diagram in Figure 5 depicts lending during normal times when domestic deposits finance lending. In contrast, the upper diagram in Figure 5 indicates lending during booms, when domestic deposits are insufficient to finance the growth in lending so that banks draw on external funding. Figure 5 suggests that non-core liabilities of banks may convey useful information on the stage of the financial cycle, possibly serving as an early warning signal of burgeoning risks to financial stability.[15]

[11] Domestic non-banks can obtain debt financing from outside the local banking system by issuing international bonds and other types of portfolio debt or by cross-border borrowing from foreign banks. However, direct cross-border debt flows are small relative to bank-intermediated cross-border flows.

[12] See Forbes and Warnock (2012) and Bruno and Shin (2011) for the role of global factors in driving capital flows.

[13] A key question, of course, is why banks do not issue equity to help support the expansion in borrowing. A large literature (see Calomiris and Kahn (1991) and Diamond and Rajan (2000, 2001)) is devoted to explaining why banks may prefer demandable or short-term debt to longer term debt or equity. Moreover, during the boom when lending margins are shrinking, banks may be intent on using their capital more intensively than on raising more capital.

[14] In this and the subsequent discussion, our major concern is about short-term sources that tend to dominate banks' wholesale funding. In Chile, banks have been issuing long-term bonds as substitutes for their shrinking deposit funding base (as pension funds switch out of bank deposits to other investments).

[15] Hahm, Shin and Shin (2011) conduct a panel probit study of the susceptibility to financial crises using the non-core liabilities of the banking sector as the conditioning variable. They find that non-core bank liabilities, especially the liabilities to the foreign sector, emerge as consistently the most robust indicator of the vulnerability to a crisis, both of a collapse in the value of the currency as well as a credit crisis in which lending rates rise sharply.