External shocks, the exchange rate and macroprudential policy

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In this session, we shall have presentations on capital flows, on credit cycles and on policies in an oil-exporting economy. By way of introduction to how these topics are linked, I would like to underline the key role of the exchange rate and explain what Bruno and Shin (2015) have called the risk-taking channel of currency appreciation. The debate on the policy response to external shocks in emerging market economies (EMEs) is often coloured by the perception that the exchange rate is not a very reliable stabilising mechanism. Events over the 2014–16 period seem to have reinforced this perception.

Very many episodes in developing countries over the past 50 years have called into question the simple macroeconomic view that exchange rate movements serve to stabilise an economy hit by external shocks. Recall the debate in the 1970s and the 1980s about **contractionary devaluations**: the main culprit was adverse balance sheet effects because of excessive foreign currency debt. And in more recent years we have discovered that, in EMEs, currency appreciation and booms have often gone together: **expansionary appreciations**.

Why should this be so? The simplest answer is the converse of the 1970s and 1980s story: currency appreciation improves the balance sheet position – real or perceived – of households or firms. More than 30 years ago, Obstfeld (1982) highlighted the importance of looking beyond simple income-expenditure models. He argued that balance sheet effects also shape macroeconomic responses to currency appreciation. He showed that a permanent appreciation increases real wealth and so reduces real savings. (In contrast, a temporary appreciation which raises only current income should increase savings.) Such wealth effects will be greater in economies where households have sizable foreign currency debts. And taking account of endogenous changes in the supply of credit reinforces this conclusion.

Is this relevant to the situation of EMEs in 2016? The short answer is "yes". Very low dollar interest rates and, in some cases, the prospect of an appreciating domestic currency induced non-financial companies in the emerging markets to borrow heavily in dollars. The consequent increase in currency mismatches in many medium-sized EMEs since 2010 means that negative balance sheet effects from currency depreciation have grown in importance. It is true that EMEs as a whole still have a positive aggregate net foreign currency position (that is, assets minus liabilities). So national balance sheets strengthen when the exchange rate falls. Other things equal, this reinforces the expenditure-switching stimulus to aggregate demand from any currency depreciation. Devaluations are expansionary.

But for the non-government sector (and this is mainly non-financial corporations), foreign currency debts far exceed foreign currency liabilities in most medium-sized EMEs (see Graph 1). By end-2015, net foreign currency liabilities of these countries have risen to 37% of exports. The consequence of this is that the
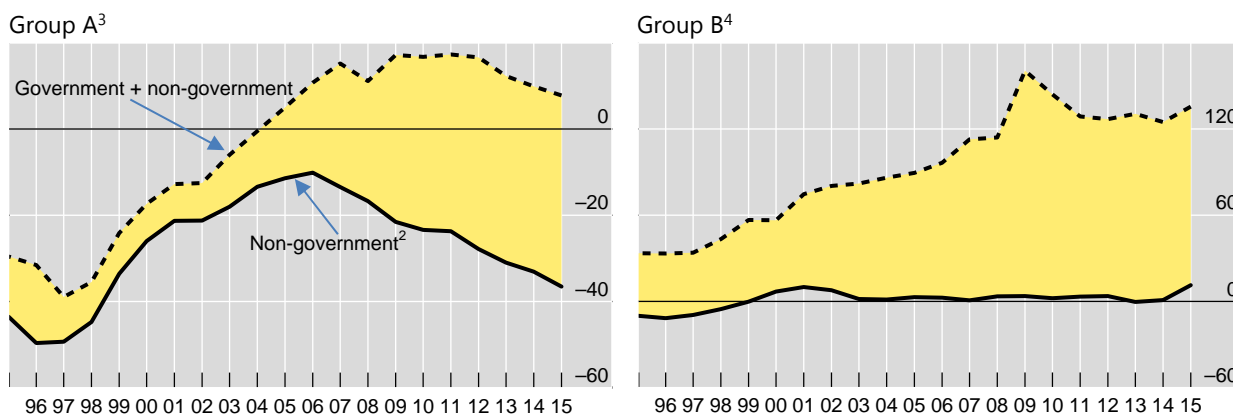
balance sheets of EM firms worsen when the currency depreciates. Because of this, they tend to switch from dollar borrowing or increase forex hedging when they see their dollar revenues fall. Such firms may also decide to cut or delay investment. With currency mismatches, therefore, depreciation could induce balance-sheet-related reactions that are contractionary.

Net foreign currency assets of EMEs[1]

As a percentage of exports   Graph 1

Group A[3]   Group B[4]

[1] For net foreign currency assets, outstanding positions of year-end. Calculated with aggregates of the economies listed in footnotes 3-4.   [2] Excluding the central bank and general government assets/liabilities where these can be identified separately.   [3] Brazil, Chile, Colombia, the Czech Republic, Hungary, Indonesia, Malaysia, Mexico, Peru, the Philippines, Poland, South Africa, Thailand and Turkey.   [4] China, Chinese Taipei, India, Korea and Russia.

Source: M Chui, E Kuruc and P Turner: "A new dimension to currency mismatches in the emerging markets - non-financial companies", *BIS Working Paper,* no 550, March 2016.

The strong rise in the dollar against other major reserve currencies from 2014 means that the balance sheet effect of currency depreciation has risen strongly (because debt is largely denominated in dollars) relative to the trade effect (because the currencies of many major export markets and of their competitors have also fallen). The recent BIS Annual Report (p 54, BIS 2016) provides tentative evidence that, for emerging economies, an equal depreciation of the debt-weighted exchange rate and the trade-weighted exchange rate may be initially contractionary. Hence the financial effects of currency depreciation related to currency mismatches can at first be stronger than the (expansionary) real economy effects.
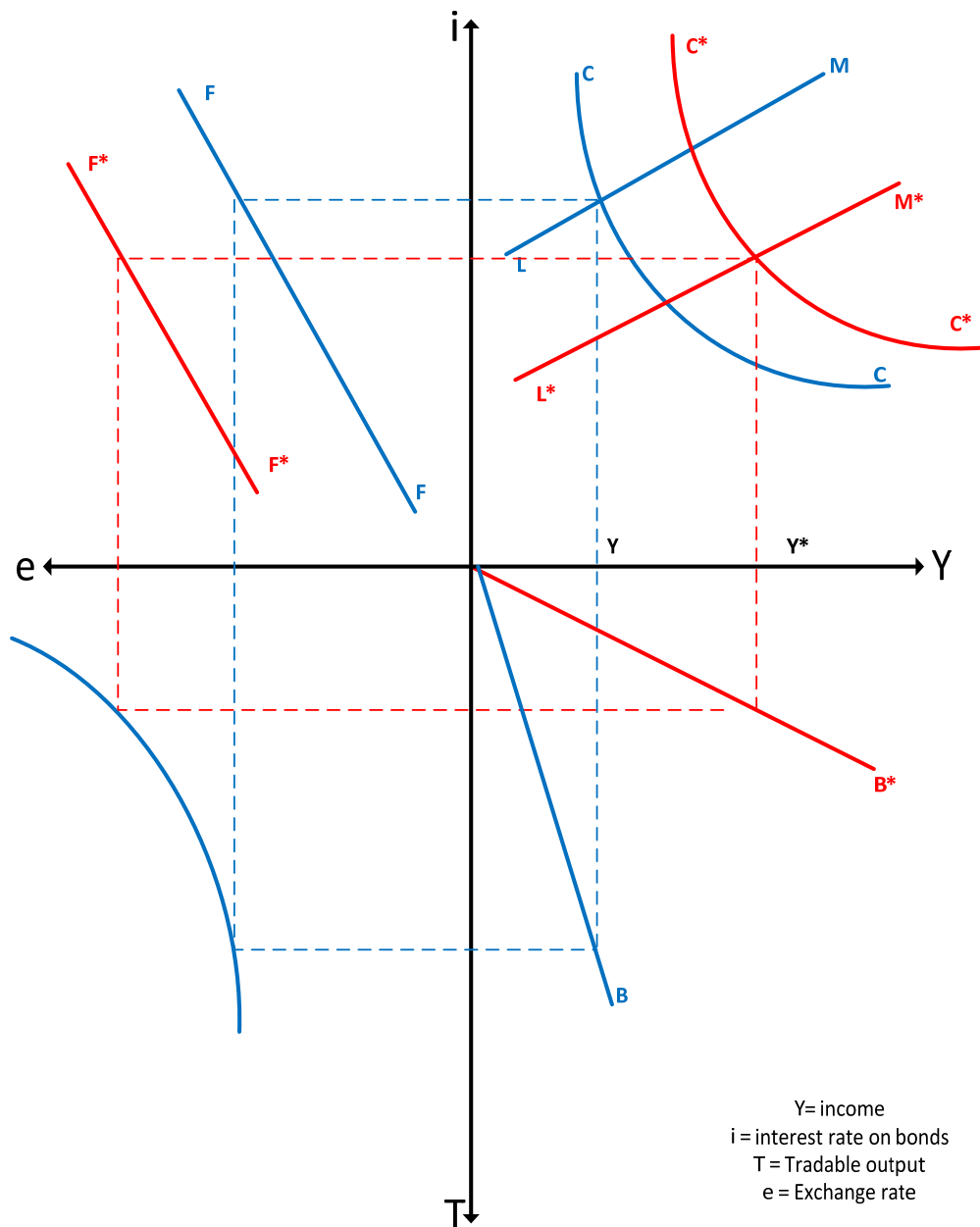
The Bernanke-Blinder model

The nature of the shock driving real currency appreciation matters. The most recent shock – which Franz Hamann is analysing in this session (see Gonzalez et al (2015)) – is the large and prolonged real terms-of-trade gains for exporters of commodities (and, since 2013, its reversal). This typically leads to nominal currency appreciation, which stimulates the supply of credit through several possible channels.

This channels are illustrated in Graph 2, which is based on Bernanke-Blinder's graph in their AER bank lending channel paper (this is in the top right quadrant), extended in a simple Mundell-Fleming framework linking the interest rate on

domestic bonds (i) to the exchange rate (e). This seminal paper replaced the IS curve by a CC curve – "commodities and credit". They did this to allow for the impact on aggregate demand of changes in the willingness of banks to lend. They motivated this by changes in "the perceived riskiness of loans" – not a change in monetary policy. Their analysis indeed **holds monetary policy constant** (defined by constant money supply in their IS-LM framework). Hence the interest rate on bonds in their model is a market interest rate. It is not a simple function of the policy rate – but instead changes as the risk taking/risk assessments of banks change.

The Bernanke-Blinder diagram: the monetary and financial channels of terms-of-trade gains

Graph 2

Y= income
i = interest rate on bonds
T = Tradable output
e = Exchange rate

This **endogeneity of the interest rate** on bonds is an essential assumption of the Bernanke-Blinder framework – allowing market rates to rise as risk-taking increases. This link between interest rates and risk-taking is crucial – but many macroeconomic analyses ignore it. The recent article of Blanchard et al (2015), for instance, made the opposite assumption. They assumed that monetary policy fixes the interest rate on bonds, which becomes an **exogenous policy variable**. Given the strong forces towards the convergence of real long-term rates in different currencies, this is a strong assumption. It is also unorthodox: normally central banks are thought to be able to control the short-term interest rate in their own currencies but not a market-determined rate such as the long-term rate.

In any event, their assumption means that capital inflows into local currency bonds do not drive down domestic long-term interest rates (which would have boosted domestic demand) but do lead to an appreciation of the real exchange rate (which is contractionary). Their conclusion that inflows into bonds are contractionary – reversing the standard Mundell-Flemming presumption for a country facing highly elastic capital flows – depends on the assumption that the local central bank faced with capital inflows can prevent the interest rate on domestic bonds from falling.

The risk-taking channel of currency appreciation

Returning to the analysis of the most recent shock, there are at least 3 possible channels through which a large and prolonged terms-of-trade gain can increase aggregate demand.

1. *Increased domestic bank lending.* As their real incomes rise, households (especially those with foreign currency debts, common in EMEs) become better credit risks. This is represented by an outward shift in the CC curve (which is just the IS curve augmented for bank lending). Income (Y) and the interest rate on bonds (i) both rise along a given LM curve if money is held constant. In an open economy, a higher rate of interest on bonds induces capital inflows and leads to currency appreciation. This link is shown by the FF schedule.

2. *A decline in the country's risk premium.* The higher real value of expected future exports in effect gives the country increased collateral, making foreigners more willing to lend. Hofmann, Shim and Shin (2016) have shown how currency appreciation in EMEs is indeed associated with a decline in the country's risk premium (ie lower sovereign credit default swap spreads). A lower country risk premium moves the FF schedule leftwards, capital inflows rise and the exchange rate appreciates. The notion that the exchange rate and capital flows respond to return differentials, which goes back to Fleming, does not of course allow for the impact of slow-moving balance sheet effects (eg mounting debts) which ultimately reverse the appreciation.

3. *Monetary expansion*, in practice so often associated with increased foreign exchange intervention. In this diagram, the central bank is assumed to follow quite a restrictive policy by allowing the exchange rate to rise to keep the current account in balance (ie along the rays B and B* from the origin) as the terms of trade improve. The only expansionary aspect assumed is that the central bank intervenes to purchase foreign exchange as capital flows increase. Unless the central bank fully sterilises purchases by selling bonds, bank reserves will usually

rise and – without changes in reserve requirements or other policies – the banking system becomes more liquid. The LM curve shifts to the right. (In practice, even greater holdings of government bonds – not just reserves – make banks' balance sheets more liquid. Gadanecz et al (2014) find evidence that increased bank holdings of government bonds in EMEs has led to an expansion in bank credit to the private sector.)

The net result of these three channels is that income is higher but the interest rate of bonds is lower. Because of the terms-of-trade gain, the current account remains in balance at a higher level of real GDP. In a closed economy, by contrast, only the first channel is operative – increased bank lending as the perceived riskiness of loans decreases. This increases income – but it raises the interest rate on bonds.

It is of course possible that a strong competitiveness impact of real currency appreciation on net exports (moving the CC curve towards the origin) would reverse this result. Such competitiveness effects, however, take years to build up and may be weak in countries dependent on commodity exports.

In addition, do not forget that real currency appreciation (especially in a commodities boom) increases gross fixed capital formation. This would move the CC curve outwards – and reinforce the impact of credit expansion. For many commodity producers, this effect of increased fixed investment seems to dominate at least for a few years the demand-depressing effect of lower competitiveness. So capital inflows, the supply of credit and the exchange rate can all rise together – and interest rates fall – when the real terms of trade improve.

This process will ultimately reverse once the terms of trade declines. The spurt of new investment will in any case run out of steam. If this analysis is correct, policy makers have to cope for several years with expansionary appreciation. Then at some unknown point in the future they will grapple with a contractionary devaluation and terms-of-trade loss. As the exchange rate overshoots in a downward direction, consumers can become much too pessimistic about their future income. Banks overtighten lending standards and risk premia on domestic assets widen alarmingly.

Left to itself, the financial system accentuates these expansions and contractions. Hence there is a role for macroprudential policies. Several speakers have indeed addressed how macroprudential policies with an exchange rate dimension (such as limiting foreign currency borrowing, increasing reserve requirements, capital flow management policies etc) can support (and perhaps reduce reliance on) foreign exchange intervention because they limit credit expansion and put downward pressure on the exchange rate (Pereira da Silva and Harris (2012)).

This analysis also applies to industrial countries receiving large capital inflows (with a current account deficit) and facing unwanted currency appreciation pressures. A rise in house prices is the classic ingredient of such credit-financed booms. But raising short-term interest rates will do little to counter this. But higher rates will usually attract capital inflows and add to currency appreciation. This can further fuel credit growth. To cool housing market pressures, the Reserve Bank of New Zealand (see Hargreaves (2016) in this volume) recently introduced macroprudential measures which allowed the central bank "to delay the tightening of interest rates, thereby reducing the incentive for any additional capital inflows into the New Zealand dollar" (Wheeler (2014)).

To conclude, the exchange rate and the interest rate on local currency bonds are key **endogenous** variables in the transmission of external shocks (financial and real)

to small open economies. Assuming either is exogenous can lead to incorrect conclusions. Analyses of macroprudential policy choices need to have a convincing "story" for both variables.

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