Changing financial intermediation: implications for monetary policy transmission

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Abstract

We show that despite heterogeneous financial intermediation structures in EMEs, bank credit remains a powerful channel of policy transmission in these countries. Credit conditions have been affected by global factors. In particular, our empirical results suggest that exchange rate appreciation tends to boost credit expansion through a currency risk-taking channel. To the extent that new credit boosts growth which in turn generates further appreciation, the link creates the possibility of positive feedback loops. Furthermore, we find that risk premium shocks have had important effects on EMEs, through their impact on both bank and non-bank credit. Against this backdrop, we argue that the standard monetary policy rules may be inadequate in meeting the multi-faceted challenges arising from financial globalization, and there is a growing case for expanding the policy toolkit.

Keywords: monetary policy, bank credit, emerging markets, risk premia

JEL classification: E40, E50, E52, F31, F41

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Introduction

The scale and characteristics of financial intermediation have changed significantly in emerging markets over the past decade. Credit to the private sector has grown rapidly in many countries, in parallel with the rise of market-based financing (see the note on "The role of banks"). In addition, as EMEs have become more financially integrated with the rest of the world, their interest rates and financial conditions have become more tightly linked to those in advanced economies – a development strengthened by exceptionally easy monetary policy in the major currency areas. At the same time, important cross-country differences in the intermediation structures remain.

This note explores *selected* implications of these changes for monetary policy. The first section identifies some common elements in the evolution of financial intermediation and discusses their implications for the monetary transmission mechanism. What becomes clear is that, despite heterogeneous financial intermediation structures, bank credit remains a powerful channel of policy transmission.

The second section examines the transmission mechanism in an environment in which global factors have gained prominence. Empirical results suggest that exchange rate appreciation tends to boost credit expansion through a currency risk-taking channel. Risk premium shocks have had important effects on EMEs, through their impact on both bank and non-bank credit.

The final section provides a simple framework for considering the implications for monetary policy of changes in financial intermediation, including external influences. In particular, it highlights some policy trade-offs and challenges that EMEs might face when the domestic transmission mechanism interacts with global financial cycles.

1. How has the transmission mechanism changed?

Monetary policy influences economic activity through a number of closely interrelated channels. These include, in particular, changes in interest rates, in asset prices and the exchange rate as well as in the non-price terms and conditions on which banks and markets grant credit. These operate both on new lending (at the margin) and on the existing stock (cash flow and valuation effects). Recently, the impact of monetary policy on perceptions and attitudes towards risk, eg by inducing search-for-yield behaviour, has been receiving greater attention – the so-called risk-taking channel (eg Borio and Zhu (2012)). The evolution of the structure of intermediation can influence the relative strength of these channels.

As the paper from the Bank of Israel for this meeting argues, changes in financial structure can affect monetary transmission mechanism in several ways. First, by changing the composition of bank and non-bank credit in the economy, they can influence how effectively the short-term interest rate is passed through to borrowing and lending rates. These changes would interact with the structure of bank balance sheets, ie the share of assets and liabilities linked to the central bank policy rate through flexible interest rates (or frequency of interest rate setting). Second, changes in financial intermediation can also alter the behaviour of the risk premium that lenders charge. Finally, changes in the availability of credit to various sectors and

borrowers in the economy would influence the responsiveness of both consumption and investment.

In principle, financial deepening should increase the influence of monetary policy on the economy by broadening financial access. Greater competition among financial intermediaries and various market segments would have a similar effect, as would a growing share of variable interest rate loans and deposits in EME banking systems (see Graph 4 in "The role of banks" note).

The continued dominance of bank credit

While trends have differed across regions and across countries, banks continue to play a very prominent role. The median share of bank credit in total credit to the non-financial sector in EMEs was 87% in 2013. At the same time, debt-to-GDP ratios have increased significantly in many EMEs. Together, these observations might suggest that the influence of monetary policy on credit flows has become more important. This would be true for its effects through demand for credit as well as supply (see below).

Against this backdrop, it is useful to assess the role that bank credit may still play in influencing aggregate demand. As an illustration, in this section we focus on investment expenditure, as this is arguably the most sensitive component of aggregate demand.

To address this issue, we follow a simple, non-structural approach. Specifically, we estimate the long-run effects on investment growth of changes in the real short-term interest rate, bank credit deflated by CPI inflation, GDP growth and real effective exchange rate depreciation. The long-run effects are obtained by adding the coefficients of four lags of each variable by one minus the coefficient on lagged investment growth. This highly stylised relationship is estimated for a selection of 12 EMEs, from four continents. Table 1 summarises the results.

Over the whole sample period (Q1 2000–Q2 2014), the real policy rate – the difference between the policy rate and the 12-month actual CPI inflation rate – has a very significant negative effect on investment in EMEs. This finding stands in contrast with the frequently reported failure to identify clear-cut evidence of effects of monetary policy in single-equation settings in advanced economies (eg Banerjee, Kearns and Lombardi (2015)).[2] Of course, the interest rate may also affect investment indirectly, by influencing credit,[3] which then influences investment. And indeed, the results indicate that the growth in bank credit has been associated systematically with stronger investment growth.

[2] For G7 economies, Banerjee, Kearns and Lombardi (2015) show that uncertainty and profits have been the more important drivers of investment, while the link between investment and short-term rates appears to be relatively weak. For earlier references on the weakness of this link, see Chirinko (1993) or Chatelain et al (2003).

[3] The fall in the supply of credit may occur as a consequence of the fall in deposits that typically follows an increase in the base rate, as alternative financial instruments become more attractive to final users. A reduction in the deposit base then pushes banks into more expensive forms of funding.

Investment response to interest rates and bank credit[1]

(Dependent variable: percentage change in real investment levels (difference in logs, sa)[2] Table 1

	Whole sample	2000–07	2008–14
Long-run effects:			
Δ Real interest rate	-0.393***	-0.402***	0.018
	(0.084)	(0.072)	(0.359)
Δ ln (Bank credit)	0.152**	0.120*	0.208**
	(0.072)	(0.067)	(0.104)
Δ ln (GDP)	0.909***	1.251***	0.960***
	(0.205)	(0.347)	(0.208)
Δ ln (REER)	0.218**	0.316***	0.091
	(0.086)	(0.091)	(0.097)
Observations	601	271	330
Sargan test (p–value)	0.381	0.186	0.437

[1] System GMM estimation using the Arellano-Bover dynamic panel estimator. The null hypothesis of the Sargan test is that the instruments are valid. *, ** and *** denote statistical significance at the 10%, 5% and 1%, respectively. Robust standard errors in parenthesis. The sample period is Q1 2000–Q2 2014.[2] Bank credit is an index of bank credit to private non-financial sector measured in local currency, deflated by the CPI. REER is the end of quarter real effective exchange rate index (an increase in the index means a depreciation of the local currency).

Source: Authors' estimations.

There is also some evidence that the independent influence of the interest rate has declined post-crisis, while that captured by credit has risen. This is reflected in the relative size and statistical significance of the corresponding coefficients in two subperiods, 2000–07 and 2008–14. Taking these results at face value, one may suggest some possible (non-mutually exclusive) explanations. As noted, credit has become much more prominent in most EMEs; as a result, it may "soak up" the explanatory power of other variables. In addition, the weaker influence of the short-term interest rate may reflect the greater independent influence of changes in risk premiums for investment, possibly because of a greater impact of external financial conditions (see below). This also highlights the possibility that long-term interest rates as well as bank lending rates and non-rate terms may in fact have become less responsive to current and expected policy rates.

Other pieces of evidence confirm the more prominent role of bank credit. Specifically, in a separate set of tests, we find that the sensitivity of investment to the growth in bank credit is higher in those countries where the share of banks in total credit is higher (see Appendix Table A1).[4] This intuitive result suggests that the previous finding is not spurious.

[4] Here we follow the World Bank corporate survey, which asked firms what proportion of investment is financed by banks. We classify countries in which this proportion exceeds the proportion reported for Germany (which is often referred to as the example of a bank-based system) as having high bank dependence, and the remaining countries as having low bank dependence. The proportion for the first group is 2.3 times larger, on average, than for the second group.

2. The role of external factors

Changes in financial intermediation have taken place against the backdrop of greater financial globalisation and hence stronger cross-border spillovers. While a more developed financial sector may be more responsive to domestic monetary policy, it may also be more vulnerable to shifts in external financial conditions. Indeed, the co-movement of short and long-term rates in the United States and the EMEs strengthened after the financial crisis (Graph 1).[5] Several recent papers have highlighted that the US term premium may have reinforced the co-movements of long-term interest rates across countries.[6] The paper from the central bank of Chile argues that the correlation of the term premium is not limited to the countries with a greater presence of foreign investors in debt markets. In a similar vein, exchange rate movements driven by shifts in global risk appetite have become a source of volatility.

This suggests that changes in intermediation structures may interact with the external environment to influence the transmission of monetary policy. The relationship between domestic credit cycles and the global financial cycle has also become more complex. The two could be related, for instance, via asset prices and foreign debt issuance, both of which can be sensitive to global risk appetite.

In order to assess this, we estimate the relationship between bank credit to the private non-financial sector and a set of possible determinants since 2000 (Table 2). A few findings stand out.

First, domestic factors are important determinants. As expected, a lower policy rate and higher GDP growth boost credit expansion.[7] Inflation, on the other hand, tends to be a drag on financial deepening (although only at the 10% confidence level).

Second, external factors also matter a lot. In particular, greater non-financial corporates' foreign bond issuance boosts bank credit expansion in an economically and statistically significant way. A positive coefficient on non-bank debt issues suggests that, on balance, market debt finance probably did not substitute for bank finance but, rather, complemented it. Very low long-term rates drove many firms to increase their borrowing in debt securities markets (see the paper on "The role of debt securities"). Taken at face value, the estimate suggests that the contribution of foreign non-bank issuance to domestic bank lending lies in the 25–30% range, on average. One possible explanation may be that part of the proceeds of foreign issuance is in turn deposited with domestic banks (Shin (2013)).[8]

[5] See Takáts and Vela (2014) on the correlation of interest rates.

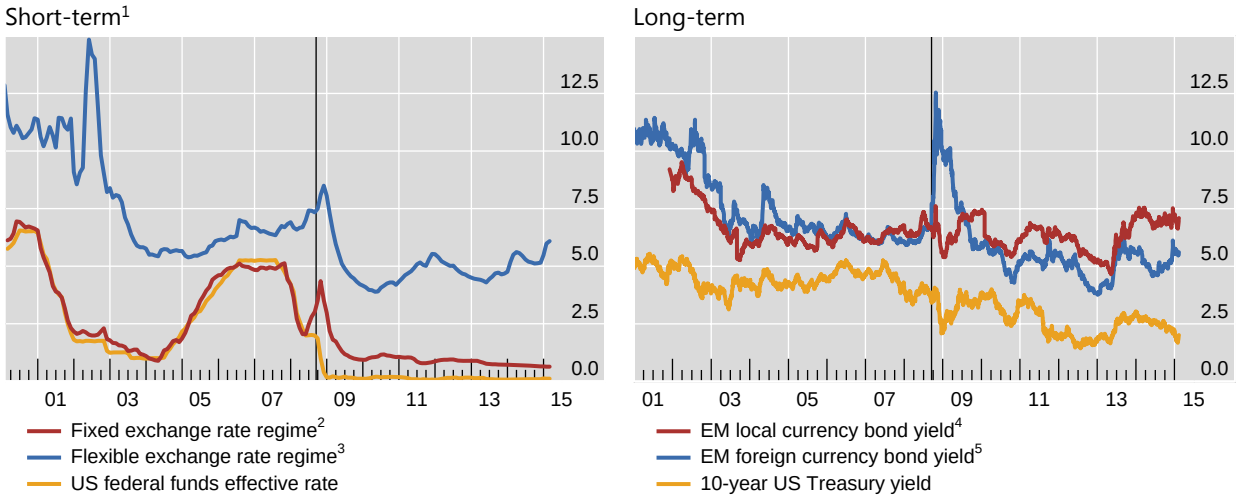
[6] See, for instance, Obstfeld (2014).

[7] Evidence for the bank lending channel in EMEs is provided by Kohlscheen and Miyajima (2015), who find that small bank loans respond more strongly to monetary policy than those of large banks. A possible reason is that small banks tend to have fewer funding alternatives.

[8] The accompanying note on "The role of banks" remarks that the median share of corporate deposits in total deposits in EMEs increased from 33% in 2004 to 45% in 2013.

Interest rates

In per cent — Graph 1



Vertical lines indicate bankruptcy of Lehman Brothers on 15 September 2008.

[1] Three-month Treasury bill yield for Algeria, three-month interbank rates otherwise. [2] Simple average of Hong Kong SAR, Saudi Arabia and the United Arab Emirates. [3] Simple average of Algeria, Argentina, Brazil, Chile, China, Colombia, the Czech Republic, Hungary, India, Indonesia, Israel, Korea, Malaysia, Mexico, Peru, the Philippines, Poland, Russia, Singapore, South Africa, Thailand and Turkey. [4] JP Morgan Government Bond Index – Emerging Markets (GBI-EM), seven to 10 years. [5] JP Morgan Emerging Market Bond Index (EMBI), seven to 10 years.

Sources: Bloomberg; Datastream; JP Morgan; national data.

Third, the exchange rate vis-à-vis the US dollar also has a clear influence on credit growth. The estimates suggest that a 10% appreciation of the local currency is associated with an 85 basis point increase in credit growth in the short run and a 135 basis point rise in the long run. This is consistent with the view that an appreciation of the dollar leads to a deleveraging of global banks, which implies a reduction in cross-border lending to EMEs (Bruno and Shin (2014)). Furthermore, currency appreciation also strengthens the balance sheet of the domestic firms that have accumulated foreign currency debt, improving their ability to raise funds. These effects would be stronger in EMEs with a greater reliance on external financing. To the extent that new credit boosts growth, and this in turn generates further appreciation, the link creates the possibility of positive feedback loops.

Finally, an increase in the VIX index tends to have a significant contractionary effect on domestic credit. A large body of literature, dating back to Pan and Singleton (2008), relates the CBOE VIX option volatility index to risk premia. The results suggest that an increase in VIX reduces credit growth beyond what is implied by the (typically) accompanying depreciation of the exchange rate and the contraction in foreign bond issuance.

Determinants of credit growth in EMEs – an illustration

(Dependent variable: percentage change in bank credit (difference in logs)) Table 2

	Model	
	I	II
Δ ln(Loans) – lagged	0.379***	0.371***
	(0.101)	(0.111)
Δ Policy rate	-0.205***	-0.207***
	(0.058)	(0.054)
Δ ln (Exchange rate)	-0.087***	-0.085***
	(0.022)	(0.023)
Δ ln (GDP)	0.214**	0.185**
	(0.097)	(0.094)
Δ ln (Deflator)	-0.086*	-0.083*
	(0.048)	(0.050)
Δ Non – bank bonds/bank credit	0.256**	0.297**
	(0.123)	(0.110)
Δ VIX		-0.055***
		(0.019)
Observations	470	439
Sargan test (p–value)	0.896	0.820

[1] System GMM estimation using the Arellano-Bover dynamic panel estimator. The null hypothesis of the Sargan test is that the instruments are valid. *, ** and *** denote statistical significance at the 10%, 5% and 1%, respectively. Robust standard errors in parenthesis. [2] The dependent variable is an index of domestic bank credit to the private non-financial sector measured in local currency.

Source: Authors' estimation.

Taken together, these findings indicate that external financial conditions have a significant impact on domestic credit. They also suggest that a tightening of global monetary conditions would dampen domestic credit growth in EMEs. And as US dollar push factors heavily influence corporates' external issuance of high-yield debt, an increase in risk spreads could have a sizeable effect due to a moderation in global investors' search-for-yield and a possible US dollar appreciation.

3. Implications for monetary policy

A number of monetary policy challenges arise when changes in domestic credit conditions and the external environment interact. One question is whether and how monetary authorities should respond to changes in financial intermediation. A second is what instruments central banks should use to respond to such changes.

How should monetary policy adapt?

To help fix ideas, consider a stylised monetary policy rule that an EME central bank might follow in pursuing macroeconomic stability:

$$i = i^* + \alpha(\pi - \pi^*) + \beta(y - y^*) + \gamma(e - e^*) \quad (1)$$

In other words, the nominal policy interest rate i is set in response to the inflation gap $\pi - \pi^*$, the output gap $y - y^*$, and the exchange rate gap $e - e^*$. The starred variables i^*, π^*, y^* and e^* represent the neutral rate of interest, the inflation target, the potential output and the equilibrium exchange rate, respectively. The rule allows for the possibility that EME central banks may wish to resist an appreciation pressure by keeping the policy interest rate lower than otherwise. The response parameters that describe the rule, α, β, γ, implicitly depend, inter alia, on the prevailing transmission mechanism.

Changes in financial intermediation may, first of all, affect monetary policy via the equilibrium or neutral interest rate in the economy (i^* in equation (1), Genberg (2008)). For instance, greater competition may reduce intermediation spreads. In this case, the equilibrium interest rate would rise, as smaller spreads boost aggregate demand.

Changes in financial intermediation may also have cyclical implications for monetary policy. Disregard the exchange rate for the moment. Then, on the one hand, a stronger domestic credit channel should enable monetary policy to respond less to domestic macroeconomic shocks (smaller α and β). On the other hand, financial globalisation could weaken the link between monetary policy and domestic financial conditions, potentially requiring monetary policy to respond more rather than less to shocks (higher α and β). An appropriate policy response would hinge on the relative importance of these two opposing forces. For example, in economies with a higher dependence on market-based financing, the high sensitivity to global financial conditions might outweigh the stronger bank lending channel.

A potential interaction between the exchange rate and the credit channel presents additional challenges. To the extent that a policy tightening induces an exchange rate appreciation that reinforces credit growth (as in Table 2), monetary policy may have a weaker traction on domestic credit conditions. In this case, the policy dilemma takes a stronger form than that discussed in Rey (2013) and Obstfeld (2014). Not only are external factors important for domestic financial conditions, but the effectiveness of domestic monetary policy may be curtailed by procyclical exchange rate adjustments.[9] It is less clear whether monetary policy should react differently to shocks in this context, although the trade-off between macroeconomic and financial stability would worsen.

A standard policy rule may therefore be inadequate in addressing the full range of cross-border spillovers. In particular, there may be cases for monetary policy to respond to changes in the risk premium. The justification for doing so is relatively straightforward in a closed-economy context. For instance, by leaning against financial measures such as credit spreads, monetary policy could improve macroeconomic stability (eg Curdia and Woodford (2010)). In this case, an augmented policy rule would add a risk premium measure to equation (1) and assign it a negative coefficient.

That said, it is less clear if such a simple response carries over to the open-economy context. In particular, the role of exchange rate movements becomes crucial.

[9] Such constraint should be more binding for EMEs where private sector balance sheets have net exposure to foreign currencies on the asset side, thus serving as a procyclical mechanism for the credit channel.

Consider a familiar scenario where an advanced economy's quantitative easing policy induces lower long-term interest rates as well as an exchange rate appreciation in EMEs. The implications for macroeconomic stability are ambiguous: lower long-term interest rates and an exchange rate appreciation have offsetting effects on aggregate demand. For example, tightening monetary policy may be more appropriate in an economy with a lower export dependence (less concern about exchange rate appreciation), and more reliance on market-based financing (greater concern about lower long-term rates). But there is no one-size-fits-all augmented policy rule in this case. Moreover, if an exchange rate appreciation boosts credit growth as noted by Bruno and Shin (2014) and in Table 2 above, then policy tightening could have an ambiguous net impact on credit, and a policy dilemma may again resurface.

Shifts in external conditions could also affect macroeconomic stability in a more dynamic and non-linear way. Market psychology, bubbles, and self-fulfilling expectations could lead to persistent overshooting in asset prices and exchange rates, if left unchecked. As a result, policymakers often assign a high priority to short-term financial market stability. During the QE tapering episodes, several EMEs had to tighten policy despite a widening risk premium in order to regain market confidence and restore financial market stability. Similarly, during episodes of large inflows and risk premium compression, there were concerns that any policy tightening could create self-fulfilling expectations of exchange rate appreciation and thus invite further inflows. When monetary policy responses are guided by such motives, they are necessarily less rule-based and more discretionary.

Nonetheless, concerns with financial stability could provide a rationale for leaning against risk premium shocks. Lower risk premia and funding costs could promote risk-taking behaviour, influencing both credit demand and supply. Private sector balance sheets could adjust procyclically, as higher asset prices raise net worth and allow further credit expansion (Adrian and Shin (2010)). This could sow the seeds of a wrenching adjustment later on, as the process reverses. Forward-looking countercyclical monetary policy can help moderate the amplitude of such financial cycles. It would also help pre-empt problems associated with a debt overhang. Where debt is high, debt servicing ability may become an additional constraint that limits monetary policy space (Juselius and Drehmann (2015)).

Role of other policy instruments

More severe policy trade-offs may stretch the ability of conventional monetary policy to attain its objectives. For instance, macroprudential policy can play a complementary role by restraining the build-up of risk over the financial cycle and by moderating the compression of risk premia during the boom (Borio (2010)). The variety of available macroprudential tools also allows sector-specific imbalances to be addressed (such as the risks of a housing market bubble or the exposure of certain sectors to foreign currency risks) – imbalances that are the root causes of stability risks and have an external origin.

In Korea, for example, strong cross-border financial flows led to private sector balance sheet vulnerabilities arising from currency mismatches. In response, in 2010 the authorities introduced a leverage cap on foreign exchange derivatives and a levy on banks' foreign currency liabilities. Bruno and Shin (2014) find some evidence that the measure reduced the sensitivity of cross-border flows to global factors.

The role and scope of non-monetary policy tools in meeting EMEs' growing challenges has been a subject of intense debate recently. Capital controls, in particular, have gained a wider support as a policy option. Recent works have also provided firmer theoretical justifications for their use (Korinek (2013)). However, empirical evidence of their effectiveness has been mixed. For instance, Forbes et al (2015) found that capital controls do not appear to influence key variables such as exchange rates, capital flows and market volatilities. Other studies found that these measures may affect the composition rather than the volume of capital flows (though such effects may still help enhance resiliency against crisis).

Macroprudential policy also has its limits. In economies where non-resident direct lending accounts for a high share of total domestic credits, macroprudential policies that target domestic banks may be less effective. In addition, since macroprudential policy works by directly influencing the balance sheet of financial intermediaries, it may affect the monetary transmission mechanism. Finally, macroprudential policy may not be very effective when rapid credit growth reflects a generalised imbalance arising from very easy monetary policy. Monetary policy, by its virtue of "getting into all the cracks", arguably still has a key role in safeguarding financial stability (Stein (2013)).

Appendix

Investment response to interest rates and bank credit[1]

(Dependent variable: quarterly percentage change in real investment (difference in logs, sa)[2])

Table A1

	Low bank dependence			High bank dependence		
Long-run elasticities:						
Δ Real interest rate	-0.495***	…	0.511***	-0.158	…	-0.126
	(0.048)	…	(0.060)	(0.181)	…	(0.177)
Δ ln (Bank credit)	…	0.056*	0.036	…	0.355***	0.347***
	…	(0.030)	(0.041)	…	(0.086)	(0.072)
Δ ln (GDP)	1.369***	1.073***	1.283***	0.907***	0.586**	0.642**
	(0.309)	(0.327)	(0.234)	(0.341)	(0.239)	(0.261)
Δ ln (REER)	0.216	0.236	0.245	0.249***	0.220***	0.220***
	(0.208)	(0.208)	(0.221)	(0.077)	(0.058)	(0.062)
Observations	310	310	310	298	291	291
Sargan test (p–value)	0.315	0.465	0.298	0.308	0.382	0.293

[1] System GMM estimation using the Arellano-Bover dynamic panel estimator. The null hypothesis of the Sargan test is that the instruments are valid. *, ** and *** denote statistical significance at the 10%, 5% and 1%, respectively. Robust standard errors in parenthesis. The sample period is Q1 2000–Q2 2014. [2] Bank credit is an index of bank credit to the private non-financial sector measured in local currency, deflated by the CPI. REER is the end-of-quarter real effective exchange rate index (an increase in the index means a depreciation of the local currency).

Source: Authors' estimation.

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