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Capital inflows and credit growth: where do we stand?

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Based on a sample of 31 advanced and emerging market economies, this Rue de la Banque shows that capital inflows tend to have a procyclical effect on domestic credit to the private sector. The lower the gross domestic product (GDP) per capita of a recipient country, the stronger the response of domestic credit to cross-border inflows. This may explain why these economies tend to restrain capital movements. Furthermore, credit is more sensitive to capital inflows in countries where exchange rate regimes are less flexible. Lastly, after a few months, procyclicality is stronger in economies where there is a large presence of foreign banks, and where outstanding cross-border bank claims on the country are high relative to domestic financial markets.

Why should we care about the impact of capital inflows on domestic credit growth?

In the two years preceding the outbreak of the global financial crisis (i.e. up to 2007Q2), cumulated gross capital inflows into advanced economies (AEs) and into emerging market and developing economies (EMDEs) represented respectively 39% and 16% of GDP. Over the same period, cumulated real credit grew by 18% in AEs and by 40% in EMDEs. Later on, following the announcement of the normalisation of US monetary policy (from 2013Q2 to 2015Q2), cross-border inward investment dropped to 15% and 9% of GDP respectively in AEs and EMDEs, while cumulated real credit growth declined to an average of 7% and 14%.¹ These two examples suggest that credit tends to co-move with capital inflows.

The analysis of the procyclical effect of capital inflows on domestic bank credit is paramount for at least two reasons. On the one hand, credit booms may be fuelled to some extent by capital inflows, and this can subsequently lead to financial crises (e.g. Thailand in 1997, Spain in 2012). On the other hand, a sudden stop in inflows might have damaging effects on the

liquidity of firms: they could struggle to roll funds over, especially in countries where the credit cycle is strongly linked to the availability of external financing.

This *Rue de la Banque* adds to the existing debate on the impact of international capital inflows by investigating two questions for a sample of 31 countries over the period 1995-2015. In which economies do capital inflows have a procyclical effect on domestic credit? What features enhance this procyclicality? We take into account the dynamic interaction between variables in order to overcome endogeneity issues. Our findings are as follows: i) domestic credit is more responsive to capital inflows in countries where exchange rate regimes are less flexible, regardless of the time horizon; and ii) after two quarters, procyclicality is enhanced by a high presence of foreign banks, and by large cross-border bank claims on the country relative to the domestic financial market.

¹ The patterns of the different types of capital flows have also changed since the crisis: foreign direct investment and portfolio equity flows have proved to be resilient, while portfolio debt and other investment flows have dropped significantly. See Bussière, Schmidt and Valla (2016).

The existing literature underlines the co-existence of both contractionary and expansionary effects of capital inflows...

Standard open-economy macro models² highlight the contractionary side of capital inflows: they reduce net exports via an appreciation of the domestic currency and thus lead to a further contraction in output. In contrast, more recently, an expansionary effect of capital inflows has been stressed, whereby they lead to credit booms and hence to a rise in output (Blanchard, Ostry, Ghosh and Chamon, 2015). The latter issue is challenging for policy-makers, especially in EMDEs: the tightening of the monetary policy stance (e.g. through an increase in interest rates) needed to contain credit booms might trigger more capital inflows. Moreover, certain specific features of the economy (e.g. the particular exchange rate regime, degree of financial openness and presence of foreign banking) may change both the impact of capital inflows on credit and the ability of policy-makers to react effectively.

Capital inflows have been found to play a major role in driving boom-bust credit cycles, particularly in economies with less flexible exchange rate regimes (Magud, Reinhart and Vesperoni, 2012; Magud and Vesperoni, 2015). With regard to their effect on output, recent empirical evidence shows that the impact depends on the nature of the cross-border flows. For a given monetary policy rate, bond inflows³ are found to be either contractionary or not statistically significant, whereas non-bond inflows⁴ tend to be expansionary through a reduction in the cost of borrowing (Blanchard et al., 2015). The nature of capital inflows is equally found to affect the relationship between domestic credit growth and capital inflows. Lane and McQuade (2014) show that domestic credit growth is strongly related to net debt inflows but not to net equity inflows.

... but dynamic effects and heterogeneity are usually neglected

One drawback of the majority of the existing studies is that they do not take into account the potential dynamic effects of capital inflows on the domestic economy. For example, the reduction in the cost of borrowing suggested by Blanchard et al. (2015) may, in practice, be smooth and last for more than one period (due to adjustment costs), thus affecting credit for several months. Second-round effects might materialise with the expansionary impact on growth, improving firms' profitability and hence facilitating their access to credit. Moreover, the endogenous reaction of policy variables is generally not addressed.

Static approaches take some key variables, such as interest rates, as given. Yet in practice, the expansionary effect of a surge in capital inflows may be offset through monetary authority intervention aimed at preventing the overheating of the economy or the build-up of a credit bubble.

Another potential limit of most existing papers lies in the use of panel econometric methodologies, which assume a homogeneous relationship between the explained and explanatory variables.⁵

How do we deal with these issues?

We estimate a dynamic structural model for each country in our sample using the methodology proposed by Schmitt-Grohé and Uribe (2017), which provides a rigorous analysis using a vector autoregressive model (VAR).⁶ In this framework, each variable, except capital inflows, may be influenced by the current or past values of all the other variables (we focus on the effects of capital inflows, not on their determinants).⁷ We are thus able both to compare, across countries, the impact of capital inflows on the domestic economy (more specifically on credit), and to analyse the dynamics of this impact, taking into account the endogenous response of other variables.⁸ For each country, IRFs (Impulse Response Functions) allow us to analyse the impact of a positive shock from gross capital inflows on domestic credit growth in the recipient economy. Countries are split into two groups, based on their median IRFs: higher response versus lower response

2 Mundell (1963), Fleming (1962).

3 Portfolio investment.

4 Foreign direct investment, portfolio equities and other investments (mainly trade and bank credit).

5 Some studies analyse heterogeneity and interactions between countries in a panel VAR (vector autoregressive) framework, but are usually limited by the number of countries or the number of lags.

6 The sample is formed by 11 advanced economies (Australia, Canada, France, Germany, Italy, Japan, Singapore, South Korea, Spain, the United Kingdom and the United States) and 20 EMDEs (Argentina, Brazil, Bulgaria, Chile, China, Colombia, the Czech Republic, Hungary, India, Indonesia, Malaysia, Mexico, Peru, Philippines, Poland, Romania, Russia, South Africa, Thailand and Turkey). The period of analysis goes from 1995Q2 to 2015Q2.

7 We test the exogeneity of capital inflows and accept it in most cases. Thus, inflows into a given country are not explained by country specific variables and, in our model, follow a simple autoregressive process.

8 For each country, the model is composed of 6 variables: gross capital inflows, gross capital outflows, trade balance, GDP growth, real credit growth, lending rate spread, and money market interest rate. Balance of payments data are used for capital inflows, IFS (International Financial Statistics) and national sources for the other variables.

of credit to a capital inflow shock.⁹ We then check whether the higher average impact is significantly different from the lower one for a given feature of the country, in order to infer the possible patterns behind this clustering. In Charts 1 and 2, the green (blue) bars represent the average level of a given feature of the country for the group with the higher (lower) credit response. The triangles represent the p-values of the difference test between these averages; the role of a feature is significant when the p-value is below the 10% and 5% confidence levels (the continuous lines). We focus on the immediate and 6-month cumulated responses of credit to gross capital inflows.

Less flexible exchange rate regimes and global banking tend to enhance the procyclical effect of capital flows on domestic credit

The most straightforward criterion for categorizing countries is economic development. According to our results, the lower the GDP per capita of a recipient country, the stronger the response of domestic credit to capital inflows (see Chart 1). This relationship holds when using a measure of financial development, such as the ratio of market capitalisation to GDP. Yet what is the economic rationale behind this result? We assess the role of certain variables that distinguish EMDEs from AEs: restrictions to capital flow mobility and less flexible exchange rate regimes.¹⁰

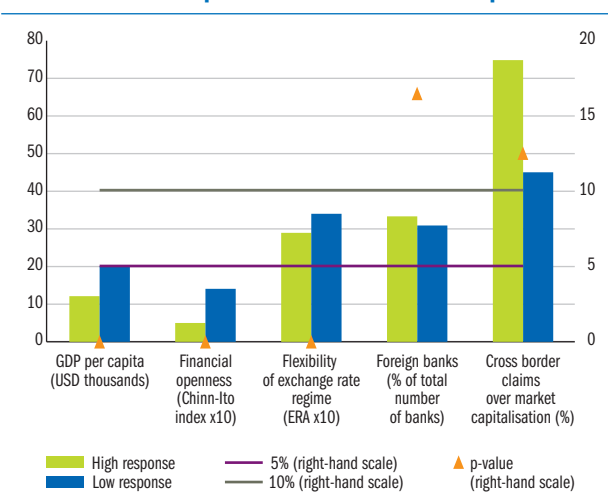
First, countries with more closed financial accounts in their balance of payments (lower Chinn-Ito index) display higher

co-movement between gross capital inflows and domestic credit. Although at first glance this appears counter-intuitive, it should be considered as an ex-post explanation in line with Mundell’s trilemma rather than as a causality relationship.¹¹ These countries, usually EMDEs, tend to restrain capital movements in order to gain monetary autonomy. By introducing capital flow management measures (CFMs), they seek to improve their ability to dampen the procyclical effect of cross-border investment on credit. Procyclicality in EMDEs is stronger than in AEs; yet it could be higher without the extra policy room provided by CFMs. As inward (outward) financial flows significantly increase, domestic authorities can tighten (ease) monetary policy without fearing further capital inflows (outflows).

Second, domestic credit is more responsive to capital inflows in countries that have adopted less flexible exchange rate regimes. This holds whatever the magnitude of inward investment, and therefore goes beyond the case of inflow booms and busts investigated by Magud et al. (2012) and Magud and Vesperoni (2015). Moreover, the economic intuition that backs our empirical evidence holds for aggregate inflows.¹²

The rationale for this result is as follows. Let us suppose that, all things being equal, a country experiences large capital inflows. The more rigid the exchange rate arrangement, the more monetary authorities have to buy foreign currency to prevent excessive appreciation of their domestic currency. While the effects of foreign reserve accumulation on domestic liquidity can be partially offset through “sterilisation”,¹³

C1 The role of country-specific characteristics in the immediate response of domestic credit to capital inflows



Sources: World Bank, World Development Indicators (WDI); BIS; Chinn and Ito (2006); IMF, Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER); authors’ calculations.

9 The capital inflows variable is captured by the gross capital inflows in percent of GDP trend. The shock is defined as an increase in capital inflows amounting to 1% of GDP.

10 This “fear of floating” of EMDEs is documented, for example, by Calvo and Reinhart (2002).

11 Authorities have to give up on one of the following three goals, as they cannot be simultaneously reached: autonomous monetary policy targeting a domestic goal, free mobility of capital flows, and a fixed exchange rate.

12 Some studies find that credit growth tends to be sensitive to certain types of cross-border flows, such as “other investment” (Blanchard et al., 2015).

13 Sterilisation is a form of monetary action in which a central bank seeks to limit the effect of inflows and outflows of capital on the money supply by offsetting the effect of foreign exchange intervention on the monetary base. In theory this can be achieved in several ways, such as by encouraging private investment overseas, or allowing foreign investors to borrow from the local market. The classical form of sterilisation is carried out through the use of open market operations, e.g. selling treasury bills and other domestic instruments to drain bank reserves after a capital inflow surge. In practice, such sterilisation can be difficult to execute and sometimes even self-defeating, as it may raise domestic interest rates and stimulate even greater capital inflows.

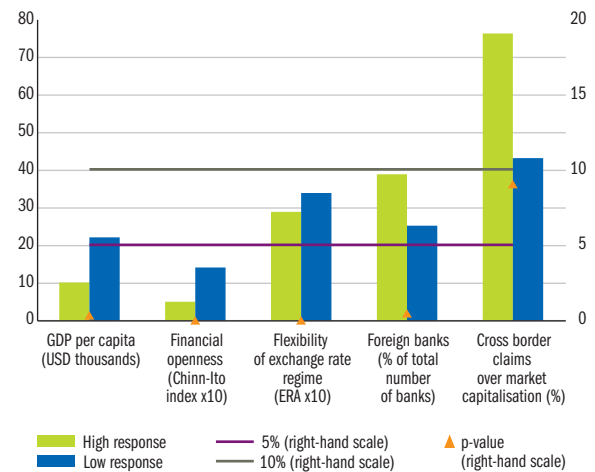
the unsterilised part of that intervention leads to an increase in the monetary base. Therefore, the domestic credit cycle is more likely to be correlated with the dynamics of capital inflows in countries with pegged exchange rate arrangements.¹⁴

Lastly, is there a global factor explaining credit procyclicality, besides the specific features of individual countries? Rey (2013) argues that, owing to the preeminence of an international credit and risk-taking channel, banks' leverage and credit growth are driven by monetary conditions in core economies (such as the United States). This global financial cycle dampens the ability of domestic authorities in other open economies to set countercyclical monetary policies, even when exchange rates are flexible. We therefore investigate the role of global banking. We find that both a high presence of foreign banks and large cross-border bank claims on the country (normalised with market capitalisation) enhance the response of domestic credit to capital inflows after a certain lag (6 months).

This result is fairly intuitive, to the extent that cross-border bank assets, which represent a big part of the "other investments" category of capital inflows, feed domestic credit. Let us assume that a wave of foreign capital entering a host country pushes domestic authorities to react by tightening monetary policy in order to prevent the build-up of a credit boom. Our result is in line with Cetorelli and Goldberg (2012): foreign affiliates of global banks are able to overcome a higher cost of liquidity in the host country and keep on raising credit by getting funds from the head office in the home country.

Some interesting policy implications can be drawn. The first is in line with the classic Mundell's trilemma: all things being equal, countries with more flexible exchange

C2 The role of country-specific characteristics in the response of domestic credit to capital inflows after 6 months



Sources: World Bank, World Development Indicators (WDI); BIS; Chinn and Ito (2006); IMF, Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER); authors' calculations.

rate regimes seem to need less countercyclical policies to mitigate the impact of capital inflows. Moreover, the beneficial effect of floating rates tends to hold over time. The second implication stems from more recent developments and backs Rey's (2013) hypothesis: to a certain extent, global banking is likely to dampen the efficacy of those policies.

¹⁴ After purchasing foreign assets from the banking sector, the central bank cannot indefinitely balance the initial increase in the monetary base by selling domestic assets to banks. If the rates yielded by foreign assets are significantly lower than the rates paid on the issuance of a large stock of securities, fiscal costs may place a heavy debt-service burden on the government or the central bank. In addition, there is a limit to the currency risk that the central bank can afford should the domestic currency appreciate further.

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