

## BOX 4 SUDDEN STOPS IN CAPITAL FLOWS: THE COLOMBIAN CASE

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### 1. Introduction

In an ever more globalized world, capital flows emerge as a viable alternative for investors who are seeking higher yields and for economies that are short on savings and looking for resources to finance their current expenditure or investments.<sup>1</sup>

Capital flows depend on international financial conditions, such as foreign interest rates and risk perception, as well as the characteristics of the recipient economies.<sup>2</sup> For that reason, although a country's financing needs might not change, inflows of capital from abroad can stop suddenly, with serious consequences for aggregate demand, employment and the financial stability of companies, the government and households.<sup>3</sup> This phenomenon is referred to in the specialized literature as a sudden stop.

For the past fourteen years, the Colombian economy has seen its current account deficit increase from around 1.0% of GDP to 6.5% in 2015. This indicates the country is spending more money than it has in terms of disposable national revenue and has resorted to foreign savings to finance this external imbalance.

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1 Lane and Milesi-Ferrati (2007) argue that financial integration had grown seven-fold, from 45.0% in 1970 to 300% in 2004, as a result of an increased in the debtor and creditor positions of countries.

2 These phenomena are referred to in the literature on capital flows as push factors, which that arise arising from the global supply of capital, and pull factors, which emerge from the host economy. See Dornbush et al. (1995), Calvo and Reinhart (2000) and Calvo, Izquierdo and Mejia (2004).

3 According to Cavallo et al. (2013), the sudden stops originating with reduced inflows of foreign capital are associated with contractions in real GDP that are between 1.5% and 3.3%.

The boom in capital flows occurred at a time when there was a clear trend toward peso appreciation, both in nominal and real terms, followed by depreciation of the peso<sup>4</sup> in a context of lower international prices for raw materials, expectations that the Federal Reserve would raise its policy rate in the United States, and slower economic growth in Latin America and Colombia. All of this shows potential external vulnerability. Thus, if the current account deficit is not corrected and flows of external financing come to a sudden stop, this would imply a sharp reduction in aggregate demand, which would affect economic growth.

This section presents an adaptation of the method proposed by Cavallo et al. (2013) to identify sudden stops in foreign capital flows and the results for the Colombian case in the period from 1996 to 2015.

### 2. Method for Identifying Sudden Stops

Liability flows in the financial account of the balance of payments, attributed to foreign direct investment (FDI), portfolio investment (PI) and other investment (OI), are regarded as Inflows of foreign capital. Asset flows from direct investment (DI), PI and OI are regarded as outflows of domestic capital. Net capital flows are understood as the difference between liability and asset flows in the financial account of the balance of payments (inflow-outflow).

According to the foregoing, and as suggested by Cavallo et al. (2013), sudden stops can be caused by different kinds of behavior (see the attachment for details); namely,

Reductions in inflows of foreign capital to the host country or increases in outflows of foreign capital invested previously in the host country.

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4 According to the literature, a crisis caused by a sudden stop in capital flows is preceded by gradual and profound appreciation of the nominal and real exchange rate, subsequent depreciation of the nominal exchange rate that is passed through to the real exchange rate and prices, deterioration in the debtor position of the economies in question, and a boom in capital flows. See Dornbusch et al. (1995) and Reinhart and Reinhart (2008). For the Colombian case, during the boom period for financial flows (2004-2012), the nominal exchange rate appreciated 25.6%; it depreciated 67.8% between 2013 and 2015.

An increase in outflows of capital from national residents for investment abroad or reductions in inflows of capital they have invested in other countries.

A reduction in net capital flows resulting from less inflow of foreign capital and more outflows of capital from residents.

Our identification of episodes of sudden stops takes into account the method proposed by Cavallo et al. (2013):

1. The quarterly figures are accumulated to avoid seasonality. Accordingly, each figure includes observations from the last four quarters:

$$F_{t,j} = \sum_{i=0}^3 X_{t-i,j}$$

Where  $j$  refers to asset, liability and/or net flows;  $F_{t,j}$  is the value of the accumulated flow and  $X_{t,j}$  is the value of the flow (gross or net) as it appears in the financial account in the balance of payments.

2. The annual change in each series is calculated:  $\Delta F_{t,j} = F_t - F_{t-4}$

3. The average and the standard deviation  $\Delta F_{t,j}$  are calculated for each of the series.

4. A sudden stop is identified pursuant to the algorithm described in Calvo, Izquierdo and Mejia (2004):

a. *Start*: when the annual change in each accumulated flow is lower (higher) than the average, minus (plus) a standard deviation for liability (asset) flows.

b. *Confirmation*: when the annual change in each accumulated flow ( $\Delta F_{t,j}$ ) is (higher) lower than the average, minus (plus) two standard deviations for liability (asset) flows.

c. *End*: when the annual change in each accumulated flow returns to the average, minus (plus) a standard deviation for the liability (asset) flows.

The period examined in this section covers the years from 1996 through 2015 and is based on the capital flows registered in the financial account of the balance of payments. Specific operations that bias the average calculations<sup>5</sup> are excluded, so as to identify the occurrence of sudden stops in Colombia.

5 Outflows of Colombian capital associated with the sale of companies in the real sector (2005), the acquisition of pension funds in Latin America (2011), and acquisitions made by the financial

It is important to point out that the Colombian economy has undergone major changes in the structure and level of its productive activities during the past twenty years. The extent of capital flows in recent years has been much higher than at the beginning of the period in question. These flows increased fourfold between 1996 and 2014, while outflows of Colombian capital in 2014 were six times higher than in 1996. A similar pattern is observed in the flow of the country's foreign trade, which increased fivefold during the same period. In addition, Colombia's financial system is now more solid than it was in the late twentieth century, and monetary policy is managed very differently than it was in the 1990s.

This being the case, assuming that annual changes in capital flows at the beginning and end of the series are equivalent ignores the transformation of the Colombian economy and does not appear to be the most suitable approach to our analysis. Accordingly, if the method proposed by Cavallo et al. (2013) were to be applied, the results would be biased, because they do not consider the existence of a trend in the data, which is characteristic of a growing economy. Thus, for a more appropriate scale, each detail in the series identifies the flow of capital for the quarter expressed as a percentage of the trend in GDP. The scale of capital flows is constructed based on the trend in GDP and not its level, so as to offset the effect of existing valuation when expressing nominal GDP in dollars.

Specifically, each quarterly detail from the financial account in balance of payments  $X_{t,j}$  is divided by the value of the trend in nominal GDP in dollars in quarter  $t$ . Then, the quarterly data are accumulated and the aforementioned method is followed identically.

### 3. Results: Sudden Stops in Colombia

Graph B4.1 shows the changes in capital flows (asset, liability and net) for the Colombian case, calculated as outlined in the previous section. The shaded areas pertain to episodes of a sudden stop, according to the proposed method.

The panel in Graph B4.1 shows a sudden surge in outflows of capital that began in the second quarter of 2006 and ended in the fourth quarter of that same year. It pertains to an increase in the constitution of foreign assets on the part of pension funds. Since that year, foreign investments made by these entities have increased

sector in Central and South America (2013) are eliminated in the case of asset flows. The payment of a particular external debt operation (2013) is excluded in the case of liability flows.

Graph B4.1  
Sudden Stops in Capital Flows: Results Scaled by Size of the Economy

A. Annual Change in Asset Flows



B. Annual Change in Liability Flows



C. Annual Change in Net Flows



a/ The gaps are calculated as the difference between the observed value and the estimated long-term value. In the case of the RER, its negative is presented. This means positive gaps, in all cases, indicate imbalances.  
Source: Banco de la República

steadily to the point where they account for nearly 35.0% of all Colombian assets in the rest of the world.

Panel B shows the results for liability capital flows. There is a sudden stop in foreign capital inflows beginning in the final quarter of 1997 and lasting up to the third quarter of 2000. It coincides with the financial crisis the country faced during 1998-1999, which was the most severe on record. Accordingly, the decline in liability capital flows at the end of the nineties can be regarded as a sharp contraction, given the characteristics of the Colombian economy during that period.

Although inflows of foreign capital declined because of reduced inflows of FDI and portfolio investment during 2015, the reductions have not been pronounced enough, at least so far, to be able to say that gross liability flows in the financial account came to a sudden stop.

Lastly, Panel C shows two important facts. First, the reduction in liability capital flows in the late nineties was sharp enough to affect net capital flows and to cause them to stop suddenly. Secondly, the decline in formation of assets abroad partly offset the reduction in inflows of foreign capital during 2015, since the contraction in net capital flows is less than the contraction in gross liability flows.

4. Conclusions

It is important to monitor the behavior of financial flows in and out of the country, be they asset, liability or net flows, so as to identify warning signs that allow for a timely reaction to any tightening in external funding. A sudden stop in foreign capital flows for an economy with a current account deficit, such as Colombia, can prompt sharp adjustments in aggregate demand, in employment and in the financial stability of companies, the government and households.

In applying the method suggested by Cavallo et al. (2013) to the Colombian case, and taking into account the size of the economy, we have identified a surge in outflows of Colombian capital during 2006 and a sudden stop in gross liability flows in 1998-2000 that was strong enough to provoke a sudden stop in net flows during the same period, which is also consistent with the momentum in growth and employment.

Moreover, although inflows of foreign capital declined in 2015 because of reduced inflows for FDI and portfolio investment, these cutbacks have not been pronounced enough, at least so far, to classify as a sudden stop in capital.

