

Box 3: Capital flow surges and stops: The South African experience

Capital inflows help offset domestic savings constraints by reducing the cost of capital and facilitating or stimulating investment, consumption and economic growth. However, significant capital inflows can lead to increased macroeconomic vulnerability through the overheating of the economy as a result of surges in asset prices. It is generally accepted that large swings in cross-border capital flows can have significant macroeconomic implications. Hence, it is not surprising that in the international empirical literature increasing attention is being given to the identification of capital flow “waves” or episodes and the characteristics accompanying these episodes. In general, these studies have focused on the cyclical behaviour of net capital flows (Dornbusch et al., 1995; Kaminsky et al., 1998; Calvo et al., 2008; Levchenko and Mauro, 2007) or gross capital flows (Lane and Milesi-Ferretti, 2001; Kraay et al., 2005; Devereux, 2007; Gourinchas and Rey, 2007).

Starting off with the standard balance-of-payments identity:

$$NR = CAB + CTA + FA + UT \quad (1)$$

it follows that:

$$NR - CAB = CTA + FA + UT \quad (2)$$

where NR = net change in foreign reserves

CAB = net balance on current account

CTA = net balance on capital transfer account¹

FA = net balance on financial account

UT = unrecorded transactions²

In terms of equation 2, the net capital flow ($NR - CAB$) is equal to the sum of unrecorded transactions (errors and omissions) and the net balances on the capital transfer and financial accounts. According to Reinhart and Reinhart (2009: 9), the left-hand side of equation 2 is one of the best indicators of net capital flows. It is a broad indirect measure of the change in domestic liabilities as a result of the purchases or sales of resources by domestic citizens and foreigners. Its popularity in empirical work is essentially due to the consistent way in which it is measured and its prompt and wide availability across countries at short time frequencies (Reinhart and Reinhart, 2009).

How are periods of significant increases (decreases) in capital flows identified? Following Dornbusch et al. (1995) a “sudden stop” is defined as a period in which there is a sudden and large decline in capital inflows.³ On the other hand, a “surge” occurs when there is a sudden and large increase in capital inflows (IMF, 2011).

Capital flow episodes can be identified as follows:⁴

$$C_t = \sum_{i=0}^3 CI_{t-i} \quad \text{where } t = 1, 2, 3, 4 \dots n \quad (3)$$

$$\Delta C_t = C_t - C_{t-4} \quad \text{where } t = 5, 6, 7 \dots n \quad (4)$$

1 The capital transfer account captures those items involving the transfer of ownership of fixed assets. In general, these inflows are small relative to overall balance-of-payments flows.

2 Unrecorded transactions essentially refer to balance-of-payments transactions where only the one leg of the transaction was identified.

3 More recently, a sudden stop has been associated with a currency crisis (Hutchison and Noy, 2006; Arteta, 2003; Razin and Rubinstein, 2004), current account reversals (Milesi-Ferretti and Razin, 2000; Edwards, 2003) and a significant contraction in economic activity (Calderón and Kubota, 2013).

4 See Ghosh et al. (2012) for a similar application.

where C_t is the four-quarter moving sum of net capital inflows (CI_t) expressed as a percentage of GDP⁵ and ΔC_t refers to the year-on-year change in net capital inflows (C_t).

In essence, the classification of an episode is determined by comparing ΔC_t to some threshold or benchmark. Conventionally, in the empirical literature, the threshold has been based on a certain number of standard deviations around the mean.⁶

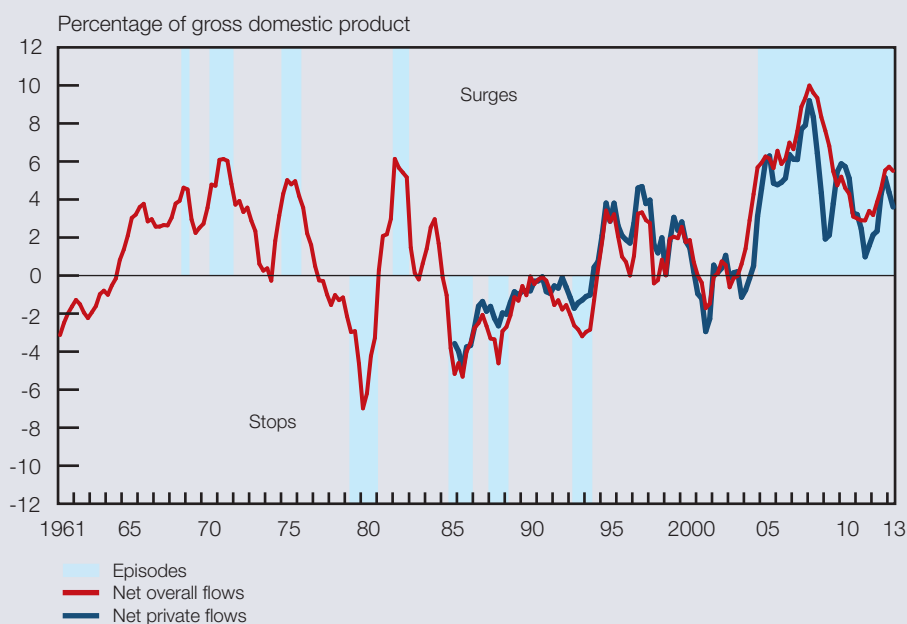
In defining a capital flow episode, a “surge” (“stop”) is a period in which the ratio of net capital flows to GDP is significantly larger (smaller) than the mean. In a practical sense the episodes are identified as follows:

- (a) A “surge” (“stop”) episode starts in a period t when the net change in capital flows ΔC_t is at least one standard deviation above (below) its mean and ends when inflows are no longer at least one standard deviation above (below) the mean.
- (b) In addition, in order to ensure that capital flow episodes only reflect excessive capital flow movements, “surges” (“stops”) are characterised by net capital flows as a percentage of GDP falling in the 75th (25th) percentile of the distribution for the entire period under analysis.⁷

An episode is defined as a period in which *both* these criteria are met for at least two quarters. Figure 1 presents the capital flow episodes based on equation 2 for the period from the first quarter of 1966 to the fourth quarter of 2011. As is to be expected, the “significant” peaks (troughs) in net capital flows are captured in the “surge” (“stop”) episodes. For comparative purposes, net private capital flows are also depicted in Figure 1.⁸

There were four “stop” and five “surge” episodes during the period under analysis. On average, the “stop” episodes averaged 5,75 quarters. The first period of significant net capital outflows in the late 1970s was due to political uncertainties related to the Soweto uprisings in 1976. The two “stop” episodes in the mid-to-late 1980s were precipitated by the 1985 debt standstill arrangement which placed a moratorium on the repayment of foreign loans and the intensification of financial sanctions against South Africa which began in earnest in 1986. There were no “stop” episodes since the advent of democracy in April 1994.

Figure 1: Capital flow episodes in South Africa



5 GDP is also calculated as a four-quarter moving sum to reflect annual equivalents and thus eliminate the impact of seasonal fluctuations.

6 The threshold in this case is a simple average of the mean based on a recursive estimate and that obtained from a five-year rolling window estimate.

7 In essence what this implies is that normal flows fall in the inter-quartile distribution. See Ghosh et al. (2012) for an application of this criterion in a cross-country panel context.

8 Private capital flows are the net balance on the financial account. While the trends are roughly the same, there are divergences in the peaks and troughs of the two series.

The “surge” episodes spanned an average of 10,6 quarters – a little more than two-and-a-half years. South Africa has been a net recipient of capital flows since the advent of democracy in 1994 and the liberalisation of the capital account in 1995. The last “surge” episode, which began in the third quarter of 2004, is the longest in South Africa’s history and is currently still on going.⁹ When this episode is excluded, the average surge episode is approximately four quarters. Net inflows averaged -3,7 per cent of GDP during the “stop” episodes and +5,4 per cent of GDP during the “surge” episodes.

References

- Calderón, C. and M. Kubota. 2013. “Sudden Stops: Are Global and Local Investors Alike?” *Journal of International Economics* 89: 122–142.
- Calvo, G., A. Izquierdo and L. Mejía. 2008. “Systemic Sudden Stop: The Relevance of Balance-Sheet Effects and Financial Integration”. National Bureau of Economic Research (NBER) Working Paper 14026. Cambridge MA: NBER.
- Devereux, M. 2007. “Financial Globalization and Emerging Market Portfolios”. *Monetary and Economic Studies* 25: 101–130.
- Dornbusch, R., I. Goldfajn and R. Valdés. 1995. “Currency Crises and Collapses”. *Brookings Papers on Economic Activity* 1995 (2): 219–270.
- Edwards, S. 2003. “Current Account Imbalances: History, Trends and Adjustment Mechanisms”. Paper prepared for the Fourth Mundell–Fleming Lecture at the International Monetary Fund, 6 November.
- Ghosh, A. R., J. Kim, M. Qureshi and J. Zluduendo. 2012. “Surges”. International Monetary Fund (IMF) Working Paper WP/12/22. Washington DC: IMF.
- Gourinchas, P. and H. Rey. 2007. “International Financial Adjustment”. *Journal of Political Economy* 115: 665–703.
- International Monetary Fund. 2011. *World Economic Outlook*, April. Washington DC: IMF.
- Kaminsky, G., S. Lizondo and C. Reinhart. 1998. “Leading Indicators of Currency Crisis”. *IMF Staff Papers* 45 (1): 1–48.
- Kraay, A. and J. Ventura. 2000. “Current Account in Debtors and Creditors Countries”. *Quarterly Journal of Economics* 115: 665–703.
- Lane, P. and G. Milesi-Ferretti. 2001. “Long-Term Capital Movements.” *NBER Macroeconomics Annual 2000*: 73–116.
- Levechenko, A. and P. Mauro. 2007. “Do Some Forms of Financial Flows Protect from Sudden Stops?” *World Bank Economic Review* 21: 389–411.
- Milesi-Ferretti, G. and A. Razin. 2000. “Current Account Reversals and Currency Crises: Empirical Regularities” in P. Krugman (ed.), *Currency Crises*. Chicago: University of Chicago Press.
- Razin, A. and Y. Rubinstein. 2004. “Exchange Rate Regimes, Capital Account Liberalization and Growth and Crises: A Nuanced View”, *mimeograph*. Israel: Tel Aviv University.
- Reinhart, C. and V. Reinhart. 2009. “Capital Flow Bonanzas: An Encompassing View of the Past and Present”. *National Bureau of Economic Research (NBER) Book Series: NBER International Seminar on Macroeconomics 2008*: 9–62. Cambridge MA: National Bureau of Economic Research.

⁹ It spanned 36 quarters from the third quarter of 2004 to the second quarter of 2013.