**Sudden stops and surges in capital flows**

The method used by Cecilia, Pablo and Esteban in the *paper A Regional reserve fund for Latin America* is the one of Calvo and is based on a proxy of net capital flows derived from monthly changes in international reserves. It is impossible to apply this method on gross flows. In the last years, there is a growing consensus in the literature that it is becoming more and more important to focus on *gross flows* instead of net flows. When you want to calculate sudden stops and surges one tend to miss certain periods of extreme flows when focusing on net flows. For example, Cowan, De Gregorio, Micco and Neilson (2008) and Rothenberg and Warnock (2011) point out that measures of sudden stops constructed from proxies for net inflows are not able to differentiate between stops that are due to the actions of foreigners and those due to locals fleeing the domestic market.

METHOD USED:

Forbes and Warnock: ‘More specifically, we use quarterly gross flows data in a sample of 58 countries over the period from 1980 through 2009 to identify four types of episodes:

* “Surges”: a sharp increase in gross capital inflows;
* “Stops”: a sharp decrease in gross capital inflows;
* “Flight”: a sharp increase in gross capital outflows;
* “Retrenchment”: a sharp decrease in gross capital outflows.

The first two types of episodes—surges and stops—are driven by foreigners while the last two—flight and retrenchment—are driven by domestic investors.

We calculate year-over-year changes in four-quarter gross capital inflows and outflows and define episodes using three criteria: (1) current year-over-year changes in four-quarter gross capital inflows or outflows is more than two standard deviations above or below the historic average during at least one quarter of the episode; (2) the episode is defined as lasting for all consecutive quarters for which the year-over-year change in annual gross capital flows is more than one standard deviation above or below the historical average; and (3) the length of the episode is greater than one quarter.’

In our baseline measure, we define gross capital inflows as the sum of inflows of direct investment, portfolio inflows and other inflows; gross private capital outflows are defined analogously as the sum of direct investment outflows, portfolio outflows, and other outflows, with reserve accumulation omitted. We also conduct a series of sensitivity tests using alternative measures, but initially focus on these inclusive measures of gross capital outflows and gross private capital inflows.

We classify an episode as a sudden stop if annual capital inflows fall below the lowest line (the two standard deviation line) for at least one quarter, with the episode starting when it initially crosses the one-standard deviation line and ending when it crosses back over the same line. Similarly, we classify an episode as a sudden surge if annual capital flows rise above the highest line (the two standard deviation line), with the episode starting when it initially crosses the one-standard deviation line and ending when it crosses back over the same line.

As an example of the outcome of their method Forbes and Warnock (2012) shows the identified sudden stop and surge episodes for Brazil. They find four periods to qualify as sudden stops: 1993Q1 to 1993Q3 (a period of hyperinflation in Brazil), 1995Q1 to 1995Q2 (the Mexican peso crisis), 1999Q1 to 1999Q2 (a devaluation in Brazil) and 2008Q2 to 2009Q3 (the most recent global crisis). Four other periods qualify as sudden surges: 1990Q2 to 1991Q1 (after Brazil elected a new president in its first democratic election in decades and hoped that inflation would be defeated), 1994Q1 to 1994Q3 (just before the Mexican peso crisis), 1995Q4 to 1996Q2 (a period of strong capital flows to many emerging markets before the Asian crisis), and 2006Q3 to 2007Q4 (just before the recent crisis). The episodes suggest that stops might be caused by a mix of domestic, regional, and global shocks, while surges might be driven by domestic or global factors.

**Table 1** *Extreme episodes in total net flows, total gross inflows and total gross outflows for Brazil, Chile, Colombia, Mexico and Peru.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Country** | **Surges**  **A) Net Flows** | **Sudden Stops** | **True Surges**  **B) Gross Inflows** | **True Sudden Stops** | **Flight**  **C) Gross Outflows** | **Retrenchment** |
| *Brazil* | 1989Q4 – 1990Q2  1992q1 – 1992q4  1995q4 – 1996q2  2007q1 – 2008q1 | 1999q1 – 1999q2  2008q3 – 2009q3 | 1994q1 – 1994q3  1995q4 – 1996q2  2006q3 – 2007q4 | 1988q3 – 1989q1  1995q1 – 1995q2  1999q1 – 1999q2  2008q2 – 2009q3 | 1987q3 – 1988q1  1989q3 – 1990q1  2006q4 – 2007q3  2010q3 – 2011q2 | 1988q3 – 1989q1  1992q1 – 1992q4  1997q4 – 1998q2  2008q2 – 2008q3 |
| *Chile* | 2005q4 – 2006q1  2008q1 – 2009q1 | 1997q3 – 1997q4  2006q2 – 2007q4 | 1998q1 – 1998q4  2006q1 – 2006q3  2007q4 – 2008q3 | 1999q1 – 1999q4  2008q4 – 2009q3 | 1997q3 – 1998q4  2006q1 – 2006q4  2007q2 – 2008q1 | 1999q2 – 1999q4  2008q3 – 2009q3 |
| *Colombia* | 2007q1 – 2007q4 |  | 2000q4 – 2001q2  2006q1 – 2006q3  2010q4 – 2011q2 | 2015q2 – 2015q4 | 2006q2 – 2006q3 | 2002q2 – 2003q1  2007q2 – 2007q3 |
| *Mexico* | 1990q1 – 1991q4  2007q4 – 2008q3  2010q1 – 2010q4 | 1994q2 – 1995q3  2012q2 – 2012q3  2014q4 – 2015q4 | 1990q1 – 1990q4  2001q3 – 2002q2  2007q3 – 2008q2  2010q1 – 2011q1 | 1994q4 – 1995q3  2008q4 – 2009q3 | 2004q3 – 2005q2  2007q3 – 2007q4 | 1992q2 – 1992q3  2008q3 – 2009q2 |
| *Peru* | 2007q1 – 2008q3 | 1998q1 – 1999q3  2005q4 – 2006q2  2009q1 – 2009q3 | 2007q1 – 2008q1 | 1998q4 – 1999q3  2008q4 – 2009q3 | 2001q1 – 2001q2  2003q2 – 2004q1  2005q4 – 2006q3  2009q2 – 2009q4  2014q3 – 2015q2 | 2007q4 – 2008q3 |

*Source:* CEPAL. In column A the surge and stops episodes are calculated for net capital flows. In column B and C we calculated the surges, sudden stops, flights, and retrenchment periods based on respectively gross inflows and gross outflows. Note that it is impossible to identify flight and retrenchment episodes with net capital flow data. All calculations are based on the method of Forbes and Warnock (2011). The data for Brazil is from 1985Q3 – 2016Q1, for Mexico is from 1986Q3 – 2016Q1, for Chile is from 1997Q3 – 2016Q1, for Colombia and Peru it is from 1999q3 – 2015q4.

Since I use CEPAL I have also made a comparison between my calculations based on CEPAL data, the results of Forbes and Warnock and the calculations based on the revised IMF data (Forbes and Warnock use IMF data as well but by now that data has been revised several times. Hence, several differences have emerged). Note that I only compare extreme episodes in gross inflows and gross outflows because Forbes and Warnock do not present their results for net flows.

**Table 2a** Comparison calculations extreme episodes in gross inflows

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Country** | **Surges**  **A) ECLAC Data** | **Sudden Stops** | **Surges**  **A) Forbes and Warnock (2012)** | **Sudden Stops** | **Surges**  **A) IMF data** | **Sudden Stops** |
| *Brazil* | 1994q1 – 1994q3  1995q4 – 1996q2  2006q3 – 2007q4 | 1988q3 – 1989q1  1995q1 – 1995q2  1999q1 – 1999q2  2008q2 – 2009q3 | 1990q2 – 1991q1  1994q1 – 1994q3  1995q4 – 1996q2  2006q3 – 2007q4 | 1993q1 – 1993q3  1995q1 – 1995q2  1999q1 – 1999q2  2008q2 – 2009q3 | 1989q4 – 1990q4  1994q1 – 1994q3  1995q4 – 1996q2  2006q3 – 2007q4 | 1999q1 – 1999q2  Comment |
| *Chile* | 1998q1 – 1998q4  2006q1 – 2006q3  2007q4 – 2008q3 | 1999q1 – 1999q4  2008q4 – 2009q3 | 2005q4 – 2006q3  2007q4 – 2008q3 | 2000q2 – 2001q1  2007q1 – 2007q2  2009q1 – 2009q3 | 2005q4 – 2006q3  2007q4 – 2008q3 | 2000q2 – 2000q4  2009q1 – 2009q3 |
| *Colombia* | 2000q4 – 2001q2  2006q1 – 2006q3  2010q4 – 2011q2 | 2015q2 – 2015q4 | 2005q4 – 2006q3 | 2008q2 – 2009q1 | 2005q4 – 2006q3  2010q4 – 2011q2 | 2015q2 – 2015q4 |
| *Mexico* | 1990q1 – 1990q4  2001q3 – 2002q2  2007q3 – 2008q2  2010q1 – 2011q1 | 1994q4 – 1995q3  2008q4 – 2009q3 | 1989q2 – 1991q2  2004q4 – 2005q2  2007q3 – 2008q2 | 1994q4 – 1995q4  2008q4 – 2009q3 | 1989q2 – 1990q4  2001q3 – 2002q2  2007q3 – 2008q2  2010q1 – 2011q1 | 1994q4 – 1995q3  2008q4 – 2009q3 |
| *Peru* | 2007q1 – 2008q1 | 1998q4 – 1999q3  2008q4 – 2009q3 | 2006q4 – 2008q2 | 1998q1 – 1998q2  1998q4 – 1999q3  2008q4 – 2009q3 | 2006q4 – 2008q2 | 1998q4 – 1999q3  2008q4 – 2009q3 |

**Table 2b** Comparison calculations extreme episodes in gross inflows

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Country** | **Flight**  **A) ECLAC Data** | **Retrenchment** | **Flight**  **A) Forbes and Warnock** | **Retrenchment** | **Flight**  **A) IMF data** | **Retrenchment** |
| *Brazil* | 1987q3 – 1988q1  1989q3 – 1990q1  2006q4 – 2007q3  2010q3 – 2011q2 | 1988q3 – 1989q1  1992q1 – 1992q4  1997q4 – 1998q2  2008q2 – 2008q3 | 1994q2 – 1994q4  1998q3 – 1999q2  2006q4 – 2007q3 | 1992q1 – 1992q4  1995q2 – 1996q1  1997q4 – 1998q2  2008q2 – 2008q3 | 1994q2 – 1994q4  1998q3 – 1999q2  2006q4 – 2007q3 | 1992q1 – 1992q4  1997q4 – 1998q2  2008q2 – 2008q3 |
| *Chile* | 1997q3 – 1998q4  2006q1 – 2006q4  2007q2 – 2008q1 | 1999q2 – 1999q4  2008q3 – 2009q3 | 1998q2 – 1999q4  2006q1 – 2006q4  2007q2 – 2008q1 | 1997q2 – 1997q3  2000q2 – 2000q4  2008q3 – 2009q3 | 1998q2 – 1999q4  2006q1 – 2006q4  2007q3 – 2008q1 | 2000q2 – 2000q4  2008q3 – 2009q3 |
| *Colombia* | 1999q3 – 2000q1  2005q4 – 2006q3 | 2000q3 – 2001q1  2012q3 – 2013q1 | 2006q2 – 2006q3 | 2002q2 – 2003q1  2007q2 – 2007q3 | 2006q2 – 2006q3 | 2002q2 – 2003q1  2012q3 – 2013q1 |
| *Mexico* | 2004q3 – 2005q2  2007q3 – 2007q4 | 1992q2 – 1992q3  2008q3 – 2009q2 | 1990q1 – 1990q4  1993q2 – 1994q1  2001q3 – 2002q2 | 1991q3 – 1991q4  1992q2 – 1993q1  1997q3 – 1997q4  2008q4 – 2009q3 | 2004q3 – 2005q2  2007q3 – 2007q4 | 1992q2 – 1992q3  1997q3 – 1997q4  2008q3 – 2009q2 |
| *Peru* | 2001q1 – 2001q2  2003q2 – 2004q1  2005q4 – 2006q3  2009q2 – 2009q4  2014q3 – 2015q2 | 2007q4 – 2008q3 | 2001q1 – 2001q2  2003q2 – 2004q1  2009q2 – 2009q4 | 2007q1 – 2007q2  2007q4 – 2008q3 | 2001q1 – 2001q2  2003q2 – 2004q1  2005q4 – 2006q3  2009q2 – 2009q4  2014q3 – 2015q2 | 2007q4 – 2008q3 |