

# Commodity prices and capital movement phenomena in emerging economies

Eliene de Sá Farias,<sup>1</sup> Leonardo Bornacki de Mattos<sup>2</sup>  
and Fabrício de Assis Campos Vieira

## Abstract

The different fluctuations recorded in the balance of payments of emerging economies reflect the vulnerability of these economies, dependent as they are on the balance of capital and trade flows. This study analyses the relationship between commodity prices and some capital movement phenomena in a group of selected emerging economies. Probit and cloglog models are estimated to establish the likelihood of these phenomena occurring and their main determinants over the period from 1995 to 2016. The results allow us to identify the main global and country-level factors shaping the phenomena, as well as the importance of the contagion effect. The study concludes that countries which export large volumes of commodities, such as soybeans, minerals and oil, are subject to phenomena of reduction in foreign capital inflows.

---

## Keywords

Commodities, commodity prices, capital movements, balance of payments, emerging markets, developing countries, mathematical models

## JEL classification

F32, F21, F14

## Authors

Eliene de Sá Farias holds a PhD from the Department of Rural Economics of the Federal University of Viçosa (Brazil). Email: [eliene.farias@ufv.br](mailto:eliene.farias@ufv.br).

Leonardo Bornacki de Mattos is an associate professor at the Department of Rural Economics of the Federal University of Viçosa (Brazil). Email: [lmmattos@ufv.br](mailto:lmmattos@ufv.br).

Fabrício de Assis Campos Vieira is a level IV assistant professor at the Department of Rural Economics of the Federal University of Viçosa (Brazil). Email: [fabriciodeacvieira@gmail.com](mailto:fabriciodeacvieira@gmail.com).

---

<sup>1</sup> The authors are grateful for the suggestions and contributions of the anonymous reviewers.

<sup>2</sup> This author is grateful for the financial support provided by the National Council for Scientific and Technological Development (CNPq) in the form of a PQ-2 research productivity grant.

# I. Introduction

Globalization has driven trade and financial relations between economies over the years, with the volume of commodity export and capital transactions increasing. Emerging economies' choice of sectors in which to concentrate their export structure, and likewise their approaches to managing capital inflows and outflows, have become crucial for their economic performance, financial stability and external competitiveness. After all, the inflow of large amounts of foreign capital into economies is associated with episodes of inflation and banking and currency crises (Forbes and Warnock, 2012). On the other hand, a reduction in the volume of foreign capital inflows can also harm nations via a worsening of the balance-of-payments current account and a decline in financing, investment and growth (Calvo, 1998; Calvo, Izquierdo and Mejía, 2004).

Emerging economies, especially those that have specialized in commodities, are vulnerable to commodity price fluctuations, a phenomenon that has been observed since the early 1970s. Notable in the past 15-year period in this regard was the impact of the favourable economic growth conditions of the 2000s, the “China effect” and the subprime crisis on commodity price fluctuations (Prates, 2007; Prates and Marçal, 2008; Verissimo and Xavier, 2014; Bredow, Lélis and Cunha, 2016).

Similarly, emerging economies are very sensitive to the behaviour of foreign capital. Over time, various studies have sought to identify and characterize the determinants of capital movements. Calvo (1998) introduced the concept of the sudden stop, a phenomenon characterized by a large and unexpected slowdown in capital movements in emerging countries.<sup>3</sup> A number of studies have also addressed capital movement phenomena (Lane and Milesi-Ferretti, 2000; Caballero and Krishnamurthy, 2006; Reinhart and Reinhart, 2009). More recently, Forbes and Warnock (2012) studied four types of phenomena, namely non-resident capital surges (sharp increases in gross capital inflows) and stops (sharp decreases in gross capital inflows), and resident capital flight (sharp increases in gross capital outflows) and retrenchment (sharp decreases in net capital outflows).

The relationship between commodity prices and capital movements has been explored in the literature. For Reinhart and Reinhart (2009), higher commodity prices tend to improve domestic fiscal indicators, encourage domestic credit growth and attract more foreign investment. Frizo and Lima (2014) found that, in periods of global growth, higher commodity prices financed the domestic structural deficit in current transactions, owing to the higher volume of foreign direct investment (FDI) going to Brazil. Bredow, Lélis and Cunha (2016) considered that the commodity price boom cycle had a positive effect on portfolio investment inflows and, to a lesser extent, on FDI. Reinhart, Reinhart and Trebesch (2016) found that, in the period from 1815 to 2015, many emerging economies suffered a double bust involving a collapse in commodity prices and a sharp decline in capital movements.<sup>4</sup>

This study seeks to investigate phenomena related to non-resident capital (surges, stops, acceleration and deceleration) and resident capital (flight, retrenchment, acceleration and deceleration). When they occur, we seek to determine whether they are affected by commodity prices, in addition to domestic and external factors, in the period 1995 to 2016. The emerging economies analysed are Argentina, the Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Guatemala, Indonesia, Mexico, Nicaragua, Paraguay, Peru, the Plurinational State of Bolivia, the Russian Federation, South Africa and Uruguay. Economies such as Argentina, the Bolivarian Republic of Venezuela, Brazil, Colombia, Mexico, Peru, the Russian Federation and South Africa are part of the Emerging Markets Bond Index Plus (EMBI+) and are also included in EMBI Global. In terms of export potential, the commodity exports

<sup>3</sup> In methodological terms, this is defined as a period in which capital inflows fall one standard deviation below their mean and show a decline of two standard deviations at some point. The episode ends when capital inflows exceed one standard deviation below their mean.

<sup>4</sup> The authors argue that many emerging economies had to deal with a reversal of a double boom in commodity prices and capital inflows after the end of the last commodity boom.

of the above economies exceed 10% of their output (World Bank and others, 2016). While China is larger than the economies in the study, its commodity exports are equivalent to just 1.82% of its output, which is why it was not included.

This study differs from others because it: (i) includes commodity prices among the factors that may affect capital movement phenomena, (ii) disaggregates the prices of the different commodities (soybeans, oil and minerals) to increase the sensitivity of the results, (iii) methodologically introduces four phenomena that precede the major phenomena already studied (stop, flight, retrenchment and surge), and (iv) separates the capital controlled by domestic agents and external agents.<sup>5</sup> The main finding supports the evidence that commodity prices affect resident capital phenomena and that the dependence of emerging economies on a few commodities is indeed associated with phenomena of reduction in non-resident capital inflows.

This analysis contributes to policymaking by considering the relationship between the trade balance and the volatility of capital movements in the selected group of emerging countries and identifying the internal and external factors that drive capital movement phenomena. The results make it possible to visualize how economic vulnerability resulting from dependence on specific commodities is linked to weaknesses in respect of capital movement fluctuations.

The paper is divided into five sections including this introduction. The second section provides a theoretical exposition of commodity prices and capital movements, while the third identifies the way the phenomena are identified and the methodological procedures for estimating their relationship with commodity prices. The fourth section uses panel probit and cloglog models to detail the empirical results of the research. The fifth and final section presents the conclusions.

## II. Commodity prices and capital movement phenomena

The model relating commodity prices to capital movements was developed by Frizo and Lima (2014) out of the assumptions of the new development economics, whose main exponent is Bresser-Pereira (2007).

The share of the services, primary income and secondary income categories in current transactions is assumed to be very low. For example, in the case of the balance of payments of Brazil (one of the economies in the sample), it is observed that 78.13% of income from current transactions in 2016 was provided by goods exports, 14.12% by services, 5.43% by primary income and 2.32% by secondary income. Since the shares of the services balance, primary income and secondary income accounts are of low significance, these categories are assumed to tend to zero owing to their lack of importance for the model.

Thus, the trade balance of commodity-exporting emerging countries is most affected by changes in the volume of commodities traded. The current transactions balance of the balance of payments can be expressed as follows:

$$CT = TB + SB + PR + SR \quad (1)$$

Equation (1) indicates that the current transactions (*CT*) balance equals the sum of the trade balance (*TB*, exports and imports), the services balance (*SB*, services provided and received by residents), the primary income balance (*PR*, wages, salaries and investment returns) and the secondary income balance (*SR*, current unilateral transfers).

<sup>5</sup> See Alberola, Erce and Serena (2016) and Broner and others (2013) for more details on the implications of using gross capital to identify phenomena.

$$TB = TB(\theta, P_c, Y, Z) \quad (2)$$

From equation (2), it can be seen that the trade balance ( $TB$ ) is affected by the nominal exchange rate ( $\theta$ ), commodity prices ( $P_c$ ), income ( $Y$ ) and control variables ( $Z$ ). We shall now show how changes in the exchange rate ( $\theta$ ) and the trade balance ( $TB$ ) are related to the movement of foreign capital ( $MFC$ ):

$$\frac{d\theta}{dMFC} < 0, \frac{dT B}{dMFC} < 0 \quad (3)$$

The first derivative of equation (3) shows that, when foreign capital inflows ( $MFC$ ) rise, there will be a larger supply of foreign exchange in the economy and a larger appreciation of the local currency ( $\theta$ ). The second derivative of (3) indicates that increased foreign capital inflows ( $MFC$ ) into emerging economies prompt a decline in the trade balance ( $TB$ ). The second relationship established will now be shown by using the aggregate consumption function to associate the exchange rate with foreign capital inflows.

$$CO = CO[Y, (\pi - r)] \quad (4)$$

In equation (4), aggregate consumption ( $CO$ ) can be seen as a function of national income ( $Y$ ) and the opportunity cost of investment ( $\pi - r$ ), which refers to the differential between the rate of profit ( $\pi$ ) and the rate of interest ( $r$ ). While lower-income workers turn most of their wages into consumption, middle-class workers, who receive higher wages, and capitalists, who receive profits and interest, will choose to invest if the conditions for higher returns are in place. In an economy with a floating exchange rate, the inflow of foreign capital tends to cause the domestic currency to appreciate, with possible repercussions in the form of increased consumption of imported goods.

$$CO = CO[\theta, (\pi - r)] \quad (5)$$

Equation (5) shows that consumption can also be a function of the exchange rate ( $\theta$ ) and investors' opportunity cost ( $\pi - r$ ). If a given economy grows through the foreign saving strategy and the current account deficit widens, the exchange rate will appreciate, leading to an increase in wages. With the wage bill at an artificially high level, profits are reduced.

$$CO = CO[MFC, P_c(\pi - r)] \quad (6)$$

Equation (6) shows consumption as a function of the movement of foreign capital ( $MFC$ ), the price of commodities ( $P_c$ ) and investors' opportunity cost ( $\pi - r$ ). This equation highlights how the exchange rate appreciates with an increase in foreign capital inflows ( $MFC$ ) and investors' opportunity cost ( $\pi - r$ ) is weighted by the commodity price ( $P_c$ ). Considering aggregate consumption ( $CO$ ), the commodity price ( $P_c$ ) and investors' opportunity cost ( $\pi - r$ ), the following ratios are obtained from equations (5) and (6):

$$\frac{dCO}{dMFC} > 0, \frac{dCO}{dP_c} > 0, \frac{dCO}{d(\pi - r)} < 0 \quad (7)$$

The relationships in (7) reveal that an increase in the movement of foreign capital into the domestic economy will increase consumption, since people will increase their consumption of imported goods as the exchange rate appreciates. Higher commodity prices increase aggregate consumption. However, if the opportunity cost of agents investing increases, aggregate consumption decreases.

The assumption in the new development economics is that the inflow of capital into an economy can be determined by the ratio of external debt to exports, classified as a risk. An increase in this risk

can reduce the inflow of foreign capital into the economy, prompting an exchange-rate devaluation and a balance-of-payments crisis.

$$MFC = MFC\left(dif f_i \frac{D_e}{E}\right) \quad (8)$$

According to equation (8), the movement of capital into emerging economies (*MFC*) is a function of external debt ( $D_e$ ) divided by commodity exports ( $E$ ). This ratio is a proxy for country risk. The term  $dif f_i$  captures the interest differential between the local economy ( $i$ ) and the rest of the world.

The export of commodities depends directly on their price and the exchange rate. The model shows that capital inflows depend on the price paid for commodities, with a greater financial volume of exports reducing foreign investors' perception of risk in the economy concerned, which positively affects international capital inflows.

As the theoretical model outlined above highlights, an increase in commodity prices is expected to decrease the probability of stops, flights, liability deceleration and asset acceleration while at the same time increasing the probability of surges, retrenchments, liability acceleration and asset deceleration.

### III. Methodology

#### 1. Procedures for identifying capital flow phenomena

The analysis focused on the aggregate amount of the portfolio investment, FDI and other investment categories, represented by the sum of the values of the three categories. Derivatives were excluded owing to their small share in the total financial account of the balance of payments. Total gross capital inflows are the sum of portfolio investment, FDI and other investment inflows. Total gross capital outflows are the sum of the outflows of these three types of investment. These phenomena are determined following the procedures adopted by Forbes and Warnock (2012), with modifications of the standard deviations for the capital movement acceleration and deceleration phenomena.

The first step in recognizing these phenomena is to capture a pattern of capital movements. Initially, such a pattern was computed by considering the period from the first quarter of 1990 to the fourth quarter of 1994 (a total of 20 quarters), using the moving average method to average the series. The average moves quarter by quarter, with the data for the most recent quarter replacing those for the oldest quarter.

The identification of episodes is based on three criteria that must be met simultaneously. The first criterion is that the quarterly change in capital inflows (outflows) must be more than two standard deviations above (below) the mean for at least one quarter. The second criterion is that the duration of the episode in successive quarters must show a quarterly change of more (less) than one standard deviation from the mean. Lastly, the episode must last for more than one quarter.

The surge (flight) phenomenon occurred when the value of the capital entering (leaving) the country was equal to or greater than one standard deviation above the mean of the last 20 quarters and thereafter remained at least two standard deviations above the mean of the last 20 quarters for a period of at least one consecutive quarter.

Similarly, there was a stop (retrenchment) when the value of capital entering (leaving) the country was one or more standard deviations below the mean of the last 20 quarters and thereafter remained at least two standard deviations below the mean for a period of at least one consecutive quarter.

This study sought to identify the existence of two other phenomena, referred to as acceleration and deceleration. The first occurred when the value of capital entering the economy rose to a level one half or more standard deviations above the mean of the last 20 quarters and thereafter remained at least one standard deviation above the mean of the last 20 quarters for at least one consecutive quarter. The second was observed when the value of capital leaving the economy fell to a level of one half or more standard deviations below the mean and thereafter remained at least one standard deviation below the mean for a period of at least one consecutive quarter.

## 2. Estimating the likelihood of capital movement phenomena in emerging economies

The probit and cloglog models were used to establish the relationship between the likelihood of phenomena occurring and a set of factors. The cloglog model differs from the probit model in that it is asymmetric around zero and is more applicable when considering less frequently occurring phenomena. For more robust results (mainly for surge and flight phenomena, which occurred, respectively, 13 and 22 times in the period between the first quarter of 1995 and the fourth quarter of 2016), the model equation was also estimated using the cloglog model. In the case of the surge and flight phenomena, the value 1 appeared with a frequency of 5.23% and 4.55%, in that order. In the case of the stop, retrenchment, liability acceleration, asset acceleration, liability deceleration and asset deceleration phenomena, by contrast, the frequency was 36.67%, 25.23%, 10.45%, 12.73%, 50.61% and 41.06%, respectively.

To avoid problems of endogeneity between the dependent variables, the formulation of the structure of the equation in which the explanatory variables (global and domestic) were lagged by one period follows the studies of Calvo, Izquierdo and Mejía (2004 and 2008); Liesenfeld, Moura and Richard (2010); Forbes and Warnock (2012); Ghosh and others (2014); Silveira and Moreira (2014); and Ghosh, Ostry and Qureshi (2016). Eight models were estimated, as each phenomenon (surge, stop, flight, retrenchment, liability acceleration, asset acceleration, liability deceleration and asset deceleration) was estimated individually. For example, when the surge phenomenon was estimated, the “phenomenon” variable took a value of 1 if it was found to exist and a value of 0 otherwise. Equation (9) was used for all the phenomena separately, and all that changed was the dependent variable, which was estimated using the probit and cloglog models.

$$\begin{aligned} Phenomenon_{i,t} = & \alpha_0 + \alpha_1 P_{i,t-1} + \alpha_2 GR_{i,t-1} + \alpha_3 GL_{i,t-1} + \alpha_4 GG_{i,t-1} + \alpha_5 GI_{i,t-1} + \\ & \alpha_6 pd_{i,t-1} + \alpha_7 edx_{i,t-1} + \alpha_8 fi_{i,t-1} + \alpha_9 GDP_{i,t-1} + \alpha_{10} CO_{i,t} + \alpha_{11} Crisis_{i,t} + \varepsilon_t \end{aligned} \quad (9)$$

In equation (9),  $i$  represents the 15 emerging economies in the study, namely Argentina, the Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Guatemala, Indonesia, Mexico, Nicaragua, Paraguay, Peru, the Plurinational State of Bolivia, the Russian Federation, South Africa and Uruguay, while  $t$  represents each of the quarters in the period from 1995 to 2016.

In the composition of equation (9), the “phenomenon” variable took the value 1 if the phenomena (surge, stop, flight, retrenchment, liability acceleration, asset acceleration, liability deceleration and asset deceleration) existed in the  $i$ -th economy of the study in the  $t$ -th quarter and the value 0 otherwise.

$\alpha_0$  is the constant.

The main variable of interest in equation (9) is the commodity price ( $P$ ), which, by inducing an increase in exports, reduces investor risk and attracts greater foreign capital flows to emerging economies. Higher commodity prices can also change the direction of resident capital flows.

The determinants of the phenomena can be divided into global and domestic factors. The global factors taken included global risk (GR), global liquidity (GL, being the sum of the M2 monetary aggregate

in the United States, Japan and the eurozone and M4 in the United Kingdom), global growth (GG) and the global interest rate (GI, being the average long-term rate on government assets in the United States, the eurozone and Japan).

The domestic factors used were public debt (*pd*), GDP per capita (*GDP*), the risk measure, represented by external debt/exports (*edx*), and financial integration (*fi*). The measure of financial integration used in this study is a proxy for capital controls, namely (assets + liabilities)/GDP, used by Forbes and Warnock (2012).

The regional contagion (*co*) variable is a dummy variable that takes the value 1 when the phenomenon under study also occurs in the other countries of the sample that are in the same region and 0 otherwise. This variable was constructed for all phenomena.

The subprime crisis (*Crisis*) variable is a dummy variable that takes the value 1 for the period from the second quarter of 2008 to the second quarter of 2009, as in the study by Forbes and Warnock (2012).

The series of the study are quarterly (first quarter of 1990 to fourth quarter of 2016), and all variables were transformed into index numbers, with 2014 as the base year. To standardize the unit of measurement, variables expressed in the tender of the country were converted into dollars at the average exchange rate for the period.

Table 1 shows the expected signs for the factors in relation to the phenomena.

**Table 1**  
Expected signs for domestic and global factors explaining capital movement phenomena

Variable	Surge	Stop	LA	LD	Retrenchment	Flight	AA	AD
Commodity price ( <i>P</i> )	+	-	+	-	+	-	-	+
Global risk ( <i>GR</i> )	-	+	-	+	+	-	-	+
Global liquidity ( <i>GL</i> )	+	-	+	-	+	-	-	+
Global growth ( <i>GG</i> )	+	-	+	-	-	+	+	-
Global interest rate ( <i>GI</i> )	-	+	-	+	-	+	+	-
Subprime mortgage crisis ( <i>Crisis</i> )	-	+	-	+	+	-	-	+
Financial integration ( <i>fi</i> )	+	-	+	-	+	-	-	+
Public debt ( <i>pd</i> )	-	+	-	+	-	+	-	+
External debt/exports ( <i>edx</i> )	-	+	-	+	-	+	+	-
GDP per capita ( <i>GDP</i> )	+	-	+	-	-	+	+	-
Regional contagion ( <i>co</i> )	+	+	+	+	+	+	+	+

**Source:** Prepared by the authors, on the basis of G. A. Calvo, L. Leiderman and C. M. Reinhart, "Inflows of capital to developing countries in the 1990s", *The Journal of Economic Perspectives*, vol. 10, No. 2, 1996; Y. Kim, "Causes of capital flows in developing countries", *Journal of International Money and Finance*, vol. 19, No. 2, April 2000; G. A. Calvo, A. L. Izquierdo and L. F. Mejía, "On the empirics of sudden stops: the relevance of balance-sheet effects", *NBER Working Paper*, No. 10520, Cambridge, National Bureau of Economic Research (NBER), 2004; G. A. Calvo, A. L. Izquierdo and L. F. Mejía, "Systemic sudden stops: the relevance of balance-sheet effects and financial integration", *NBER Working Paper*, No. 14026, Cambridge, National Bureau of Economic Research (NBER), 2008; G. M. Milesi-Ferretti and C. Tille, "The great retrenchment: international capital flows during the global financial crisis", *Economic Policy*, vol. 26, No. 66, April 2011; K. J. Forbes and F. E. Warnock, "Capital flow waves: surges, stops, flight, and retrenchment", *Journal of International Economics*, vol. 88, No. 2, November 2012; M. Fratzscher, "Capital flows, push versus pull factors and the global financial crisis", *Journal of International Economics*, vol. 88, No. 2, November 2012; M. A. C. Silveira and A. Moreira, "Paradas e flights súbitas dos fluxos de capital nos países emergentes: fatores globais e locais", *Texto para Discussão*, No. 1932, Rio de Janeiro, Institute of Applied Economic Research (IPEA), 2014; S. M. Bredow, M. T. Lélis and A. M. Cunha, "O ciclo de alta nos preços das commodities e a economia Brasileira: uma análise dos mecanismos externos de transmissão entre 2002 e 2014", *Economia e Sociedade*, vol. 25, No. 3, December 2016; P. Frizo and R. A. S. Lima, "Efeitos da flutuação dos preços das commodities no fluxo de investimento estrangeiro direto no Brasil", *Revista de Economia Contemporânea*, vol. 18, No. 3, September-December 2014; C. M. Reinhart, V. Reinhart and C. Trebesch, "Global cycles: capital flows, commodities, and sovereign defaults, 1815–2015", *American Economic Review*, vol. 106, No. 5, May 2016.

**Note:** LA = liability acceleration, LD = liability deceleration, AA = asset acceleration and AD = asset deceleration.

### 3. Data sources

The variables used to detect capital movement phenomena are the capital sub-account categories, namely foreign direct investment, portfolio investment and other investment. These variables are provided by the International Financial Statistics (IFS) database of the International Monetary Fund (IMF, 2017), in dollars.

The commodity price variable is the total commodity price index (PALLFNF). For the sensitivity analysis, use was made of the mineral price index (PMETA), the soybean price index, which is the average of (PSMEA+PSOIL+PSOYB), and the oil price index, which is the average of (PNRG+POILAPSP). The price variables were taken from the International Financial Statistics database of the International Monetary Fund (IMF, 2017), and were provided in index numbers.

Data on global factors were taken from a variety of sources. Global risk was based on the Chicago Board of Exchange (CBOE) VIX volatility index, which is derived from put and call option prices on the S&P 500 index (Cboe, 2017).

Global liquidity, the global interest rate and global growth (in dollars) were also taken from the International Financial Statistics database (IMF, 2017).

With respect to domestic factors, information from the World Economic Outlook database (IMF, n.d.) was used for financial integration (in dollars), the risk indicator (external debt/exports) and external debt, while data on free-on-board exports were taken from the International Financial Statistics database (IMF, 2017). Data on public debt as a share of GDP and GDP per capita, in dollars, were also extracted from the World Economic Outlook database (IMF, n.d.).

## IV. Results and analysis

### 1. Identification and explanation of capital movement phenomena in the set of selected commodity-exporting countries

The 15 commodity-exporting emerging economies in this study experienced episodes of the phenomena studied (surge, stop, flight, retrenchment, liability acceleration, liability deceleration, asset acceleration and asset deceleration) in the period from 1995 to 2016. The number of episodes of these phenomena in the economies analysed is presented in table 2.

Failure to find many phenomena in capital inflows does not mean that large volumes of non-resident capital do not enter or even that the value of resident capital in other economies is small. However, it may signify that this upward trend in resident and non-resident capital occurs in a more concentrated and approximate way around the mean during the period analysed. The result is that not many episodes presenting a discrepancy with respect to the past mean of capital inflows into the economies have been detected.

Some unexpected shocks in the economies may explain a large part of the phenomena. For this reason, we sought to relate these episodes within a historical framework of different crises and financial weaknesses affecting emerging economies in the reference period.



**Table 2**  
Capital movement phenomena in selected commodity-exporting countries  
(Numbers)

Country	Surge	Stop	LA	LD	Retrenchment	Flight	AA	AD	Total
<b>Africa</b>									
South Africa	0	8	2	7	6	1	3	9	36
<b>South America</b>									
Argentina	1	5	1	5	5	0	3	11	31
Bolivia (Plurinational State of)	0	7	0	8	5	1	5	10	36
Brazil	1	7	2	7	9	0	0	13	39
Chile	0	9	0	12	8	1	4	11	45
Colombia	0	6	1	8	0	1	3	11	29
Paraguay	2	3	5	6	2	5	4	6	33
Peru	1	8	1	10	5	2	5	11	43
Uruguay	2	6	3	9	4	3	5	7	39
Venezuela (Bolivarian Republic of)	2	10	4	12	9	1	3	12	53
<b>North America</b>									
Mexico	0	10	2	10	6	1	2	8	39
<b>Central America</b>									
Guatemala	0	5	0	11	4	2	6	5	34
Nicaragua	3	1	4	5	3	1	7	5	29
<b>Asia</b>									
Indonesia	3	6	7	8	9	2	3	9	47
<b>Eurasia</b>									
Russian Federation	2	3	5	7	8	1	2	7	35
Total	17	94	37	125	83	22	55	135	568

**Source:** Prepared by the authors.

**Note:** LA = liability acceleration, LD = liability deceleration, AA = asset acceleration and AD = asset deceleration.

With the neoliberal reforms implemented from the second half of the 1980s, the Mexican economy exhibited an intermediate stage of financial openness (Freitas and Prates, 1998). According to Prates (2005), the Mexican crisis that broke out in 1994, unlike the other crises in Latin American countries at that time, was not the result of irresponsible behaviour stemming from government fiscal policies. According to the author, investment in the economy fell considerably because the country was not in a position to meet its short-term obligations. In fact, as can be seen in table 2, there were a total of 10 stop and 10 liability deceleration episodes in Mexico. The repercussions of the Mexican crisis were felt in the other emerging economies, as it represented an adjustment in the Latin American economies, and the increase in currency risk resulted in a sell-off of Latin American assets and, consequently, capital flight from those economies.

Countries whose fiscal and monetary fundamentals were considered sound were subjected to the 1997 Asian financial crisis, which mainly affected the countries in the south-east of that region (Prates, 2005). According to the author, as well as affecting exchange-rate regimes, this crisis led to a reversal of capital movements and to banking fragility, which even spread to other regions. During the crisis period, Indonesia experienced two episodes of capital inflow stops and one of liability deceleration, while there was one episode of resident capital flight, one of retrenchment and one of asset deceleration.

According to Johnson and others (2000), although the 1997 crisis started in Asia and some Latin American countries, its effects spread so far that in 1998 they reached the Russian Federation and Brazil. The authors state that in 1998 the Russian Federation went through a period of devaluation that caused the country's debt to increase. These events revealed the fragility of the economy in the face of default risk, and for this reason investor capital flight increased in a number of countries' financial markets. Between 1995 and 2016, the Russian Federation saw eight episodes of flight and seven of

deceleration in the capital movements of residents, who, affected by contagion, avoided countries with similar structures. Specifically, stop, flight, liability acceleration and liability deceleration episodes were observed in the Russian economy during the crisis.

Subsequently, on top of the repercussions of the Asian, Russian and Brazilian crises, according to Batista Junior (2002), foreigners became increasingly distrustful over the 2000s of the financial system in Argentina, whose currency had been pegged to the dollar for nearly 10 years. This led to defaults by private debtors and a deterioration in the quality of bank assets. According to the author, the Argentine economy suffered several shocks from 1997–1998 onward, including a reduction in foreign capital. The results show that Argentina suffered five stop and five flight episodes between the first quarter of 1995 and the fourth quarter of 2016, in addition to a considerable deceleration in the movement of Argentine resident capital (giving a total of 11). During the crisis period, capital flowing into Argentina was subject to stops and liability deceleration, while Argentine investors' capital presented episodes of flight and deceleration.

Aldrighi and Cardoso (2009) stress that the external shocks suffered by Asia, the Russian Federation and Brazil in the periods mentioned led to a stop in foreign capital inflows. As justification for these effects, the authors point to the low degree of openness, dispersion in the public and private sectors and difficult fiscal situation of these economies. These factors increased their vulnerability and made them more susceptible to exchange-rate and financial crises.

The period between 2007 and 2008 was marked by the subprime mortgage crisis, which affected capital mobility between economies. This crisis began in the United States and had repercussions in other economies by changing agents' expectations, increasing global risk and reducing the volume of capital movements in emerging economies. The scale of the crisis is confirmed by the stop, flight, liability and asset deceleration phenomena that can be observed in almost all the countries of the sample during this period.

It should also be pointed out that periods of resident and non-resident capital acceleration and deceleration occurred prior to these crises. After all, despite the impact of the 2008 crisis, there was an upsurge in the movement of capital (especially short-term capital) to emerging economies, including Brazil, in mid-2009, owing to the large spread between domestic and external interest rates (Barbosa Filho, 2017).

## 2. The relationship between commodity prices and capital movement phenomena

The results of equation (9) using probit and cloglog models for episodes affecting non-resident capital (stop, surge, liability acceleration and liability deceleration) and resident capital (flight, retrenchment, asset acceleration and asset deceleration) are presented in table 3.

To ascertain the overall significance of the model, the result of the Wald test is presented in table 3. The null hypothesis is rejected at a significance level of 1%, so the models for each phenomenon are well specified.

The relationship between commodity prices and non-resident capital phenomena was not apparent. One justification for this result may be that the use of the total commodity price index does not reflect the reduction in emerging economy risk. Commodity prices did influence the flight and asset deceleration episodes in the case of resident capital, however. A reduction in emerging economy risk brought about by higher commodity prices influences domestic investors to invest more of their capital abroad.

**Table 3**  
Results for the estimation of the likelihood of resident and non-resident capital movement phenomena

Variable	Non-resident capital								Resident capital							
	Probit				Cloglog				Probit				Cloglog			
	Stop	Surge	LA	LD	Stop	Surge	LA	LD	Flight	Retr.	AA	AD	Flight	Retr.	AA	AD
Commodity price	0	0	0	0	0	0	0	0	(-)*	0	0	(+)*	(-)**	0	0	0
<b>Global variables</b>																
Global risk	0	(-)**	(-)**	0	(-)*	(-)**	(-)**	0	0	0	0	0	0	0	0	0
Global liquidity	(+)**	0	0	(+)**	(+)**	0	0	(+)**	0	0	0	(+)**	0	0	0	(+)**
Global growth	(-)**	0	0	0	(-)**	0	0	0	0	0	0	0	(+)*	0	0	0
Global interest rate	0	0	0	0	0	0	0	0	(-)**	0	0	(+)**	(-)**	0	0	(+)*
<b>Crisis</b>																
Subprime mortgage crisis	0	0	0	(+)**	0	0	0	(+)**	0	0	0	0	0	0	0	0
<b>Contagion</b>																
Regional	(+)**	(+)**	(+)**	(+)**	(+)**	(+)*	(+)**	(+)**	0	(+)**	(+)**	(+)**	0	(+)**	(+)*	(+)**
<b>Domestic variables</b>																
External debt/exports	0	0	0	0	0	0	0	0	(+)**	0	0	0	(+)**	0	0	0
Public debt/GDP	0	0	0	0	0	0	0	0	(-)**	0	(-)*	(+)*	(-)**	0	(-)**	0
GDP per capita	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Financial integration	0	0	0	0	0	0	0	0	(+)*	0	0	0	0	0	0	0
Number of observations	1 305	1 305	1 305	1 305	1 305	1 305	1 305	1 305	1 305	1 305	1 305	1 305	1 305	1 305	1 305	1 305
X <sup>2</sup>	148.27	246.39	234.80	152.16	183.55	646.61	462.40	166.35	269.85	493.25	144.54	39.55	284.32	732.88	116.71	32.42
Probability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Likelihood ratio	34.60	45.21	114.27	31.85	41.68	40.41	113.73	37.50	7.14	102.47	34.71	43.64	8.12	97.52	35.73	38.91
Probability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**Source:** Prepared by the authors, on the basis of their research results.

**Note:** LA = liability acceleration, LD = liability deceleration, Retr. = Retrenchment, AA = asset acceleration, AD = asset deceleration. The "-" sign means that the variable was statistically significant and had a negative sign, "+" that the variable was statistically significant and had a positive sign and "0" that the variable was not statistically significant, with \*\* indicating significance at 1%, \* significance at 5% and . significance at 10%. Standard errors clustered at the country level were used.

Among the global determinants, contrary to expectations, the global liquidity variable affected the likelihood of stop and liability deceleration episodes occurring. Increased currency issuance internationally means a greater volume of capital to seek returns on. While emerging economies present risks, they also offer high yields. However, changes in domestic indicators can act as a disincentive to foreign investors, thus explaining the increase in stop episodes. Among the external factors, an increase in global liquidity was associated with an increase in resident capital deceleration. This result may be related to the ability of domestic economies to honour the commitments they have made, as this prevents domestic agents from opting for more liquid financial systems and thus rationing domestic credit (Silva and Resende, 2010).

The results point to global growth as a factor reducing the likelihood of disruptions to capital flows. Higher global growth suggests higher wages and greater purchasing power in the hands of agents who can allocate or maintain their investments, favouring emerging economies and preventing large reductions in foreign capital inflows.

The results also point to global growth as a factor driving flight episodes. Some conditions in foreign economies may attract migrant domestic capital, namely increases in domestic and private consumption and in investment, and decreases in the unemployment rate in economies that transact in the financial system.

Global risk was found to be important for the surge model, since when international uncertainty increases, investors are more likely to be sceptical about investing large amounts of capital. The same result is obtained for the phenomenon that precedes it: liability acceleration. According to these results, in periods of increased risk aversion, when financial fear or even panic can be perceived, foreign capital inflows into emerging economies decline.

A rise in the global interest rate was associated with a reduction in the likelihood of flight and asset deceleration episodes. These results ran counter to expectations, since if there is a greater prospect of returns in economies with greater investment security, domestic investors would be expected to increase the amount of capital invested abroad. No association between the interest rate and non-resident capital phenomena was found, however, and this response was likewise absent in the Forbes and Warnock (2012) study.

Another finding was that domestic factors were not related to non-resident capital phenomena. Other studies have also claimed that external factors are more important than domestic ones. Calvo, Leiderman and Reinhart (1996) highlighted the importance of external factors in explaining capital movements towards emerging economies in the 1990s. Munhoz (2013) noted that the vulnerability of emerging economies such as Brazil could be attributed to reversals in capital movements driven by exogenous forces. Similarly, Calvo, Izquierdo and Mejía (2004) argued that highly indebted countries tended to be more prone to capital flow reversals. The authors tested this claim for various approaches to measuring domestic public debt and found no clear evidence regarding the role played by public debt in sudden and sharp reductions of non-resident capital flows. The results of this study also confirm the limited significance of economies' public debt in determining non-resident capital movement phenomena.

With respect to the domestic factors driving phenomena, a rise in external debt/exports is associated with an increase in flight episodes. According to Silveira and Moreira (2014), sudden flight phenomena in different countries' capital movements have a more dispersed frequency and are more affected by domestic shocks. This explains the table 3 results, in which more domestic factors are found to determine the likelihood of flight episodes.

Higher domestic borrowing in an economy is associated with a reduction in the flow of domestic capital into the international financial system. If economic performance is weaker, this is also reflected in a lower volume of capital flowing into foreign investment.

The results show that the higher the degree of financial integration, the more likely flight episodes are to occur. If emerging economies increase their interaction with other economies, there is a possibility that the amount of domestic capital sent abroad will increase.

The subprime mortgage crisis was associated with episodes of some phenomena, such as capital movement stops and deceleration. The uncertainty in the international environment and the bankruptcy of a number of investors led to a sharp reduction of capital in several economies, especially emerging ones.

Moreover, geographical proximity increased the likelihood of all non-resident and resident capital movement phenomena except flight. This finding can be interpreted in two ways. In periods when economies inspire confidence in the financial market, this sentiment can be seen to extend to other economies with similar characteristics. Thus, an increase in capital in one economy is likely to spread to other economies in the same region as well. On the other hand, if the market loses confidence in a given country, there is a certain tendency for scepticism towards similar economies to increase. Thus, a reduction in capital in one economy may also occur in its peers. Contagion and a greater role for external than domestic factors in non-resident capital phenomena were also identified by Forbes and Warnock (2012).

To provide a stronger basis for the results, we attempt to ground them in pull and push factors as drivers of capital movements. First, we seek to understand whether capital investment in emerging economies is motivated by adverse forces in developed economies. This would mean that capital was somehow coming under pressure to migrate because of unfavourable conditions in developed economies (Fernández-Arias, 1996). The argument used about capital attracted by such forces is that it is highly volatile, owing to its distance from local policymakers.

We then consider foreign capital attracted by favourable conditions in emerging economies, i.e. foreign capital directed towards these economies because domestic policies are having an effect. In this case, domestic factors may act as a stronger force than external factors (Fernández-Arias, 1996). From the results presented in table 3 it can be seen that it is usually adverse conditions in developed economies that have led to massive increases or decreases in foreign capital inflows to emerging economies.

Differences in response between resident and non-resident capital phenomena were also identified. Calvo, Izquierdo and Mejía (2004) analysed differences in capital reversals, distinguishing between capital attributed to residents and non-residents. Analysing the case of the Chilean economy, Cowan and De Gregorio (2005) showed that much of the movement in the capital balance was due to fluctuations in residents' gross capital. This study also provides justifications for analysing the gross capital controlled by residents and non-residents, since the factors behind large inflows or outflows of capital are different, as can be seen in table 3.

The study also points out that commodity-exporting economies have advantages in certain production activities and therefore trade products on the international market that give them greater comparative advantages over other economies. The tendency of economies to expand the sectors in which they have comparative advantages, in this case natural resources, can trigger deindustrialization, a phenomenon known as Dutch disease (Sonaglio and others, 2010). This syndrome can also manifest itself in economies through appreciation of the domestic currency as capital inflows increase because of commodity exports (Bredow, Lélis and Cunha, 2016).

To perform a sensitivity test on these results, the sample was subdivided<sup>6</sup> on the basis of three specific commodities exported by the sample countries, namely minerals,<sup>7</sup> soybeans<sup>8</sup> and oil.<sup>9</sup> Equation (9) for the phenomena was estimated once again considering the new division of the sample. However, it was not possible to obtain consistent results for all phenomena, as some of them presented a frequency of 1 below 5% and some models were not well specified. Table 4 presents the results for the capital movement phenomena, considering the prices of minerals, oil and soybeans.

With respect to the main model, the results presented in the sensitivity test for disaggregated prices allow some observations to be made, namely:

- (i) When the groups of economies specializing in three commodities (soybeans, minerals and oil) are distinguished, the results show an even more effective relationship between their prices and the likelihood of non-resident capital phenomena occurring, especially phenomena involving reduced capital inflows, such as stops and liability deceleration. This result clearly shows how dependent the economies analysed are on certain commodities and how changes in their prices can indeed affect capital movements particularly strongly.
- (ii) In the case of disaggregated prices, domestic factors were also important (as determinants) for the likelihood of non-resident capital movements occurring.
- (iii) As shown in the main model, the sensitivity test highlighted the role of higher prices for commodities (minerals and soybeans) in reducing domestic capital outflows, mainly through the asset deceleration phenomenon.
- (iv) The global interest rate was found to be particularly sensitive.
- (v) The analysis of disaggregated prices showed that the subprime mortgage crisis had a particularly strong impact in reducing capital inflows from foreign investors.

<sup>6</sup> This subdivision of economies considered the commodities that they exported the most and that appeared most frequently in order to obtain a larger number of countries in the sample.

<sup>7</sup> Brazil, Chile, Guatemala, Peru and South Africa.

<sup>8</sup> Argentina, Brazil, Paraguay, the Plurinational State of Bolivia and Uruguay.

<sup>9</sup> Brazil, Colombia, Indonesia, Mexico, Peru and the Plurinational State of Bolivia.

**Table 4**  
Sensitivity test results for the prices of selected commodities

Variable	Minerals			Oil						Soybeans				
	Probit			Cloglog			Probit		Cloglog		Probit		Cloglog	
	Stop	LD	AD	Stop	LD	AD	Stop	LD	Stop	LD	Surge	AD	Surge	AD
Commodity price	(-) <sup>***</sup>	(-) <sup>***</sup>	(+) <sup>*</sup>	(-) <sup>***</sup>	(-) <sup>***</sup>	(+) <sup>*</sup>	(-) <sup>*</sup>	(-) <sup>**</sup>	0	(-) <sup>*</sup>	0	(+) <sup>**</sup>	(-) <sup>*</sup>	(+) <sup>*</sup>
Global variables														
Global risk	0	0	0	0	0	0	(-) <sup>**</sup>	0	(-) <sup>**</sup>	0	(-) <sup>**</sup>	0	(-) <sup>**</sup>	0
Global liquidity	0	(+) <sup>***</sup>	(+) <sup>***</sup>	0	(+) <sup>**</sup>	(+) <sup>***</sup>	0	(+) <sup>*</sup>	0	(+) <sup>**</sup>	0	0	0	0
Global growth	(-) <sup>**</sup>	0	0	(-) <sup>***</sup>	0	0	(-) <sup>**</sup>	0	(-) <sup>***</sup>	0	(+) <sup>***</sup>	0	(+) <sup>**</sup>	0
Global interest rate	0	(+) <sup>**</sup>	(+) <sup>***</sup>	0	(+) <sup>**</sup>	(+) <sup>**</sup>	0	0	0	0	0	0	0	0
Crisis														
Subprime mortgage crisis	(+) <sup>**</sup>	(+) <sup>**</sup>	0	(+) <sup>**</sup>	(+) <sup>***</sup>	0	0	(+) <sup>*</sup>	0	(+) <sup>*</sup>	(+)	(-) <sup>**</sup>	(+) <sup>***</sup>	0
Contagion														
Regional	(+) <sup>***</sup>	(+) <sup>**</sup>	(+) <sup>***</sup>	(+) <sup>***</sup>	(+) <sup>**</sup>	(+) <sup>**</sup>	(+) <sup>***</sup>	(+) <sup>***</sup>	(+) <sup>**</sup>	(+) <sup>***</sup>	0	(+) <sup>**</sup>	0	(+) <sup>***</sup>
Domestic variables														
External debt/exports	0	0	(-) <sup>***</sup>	0	(+) <sup>*</sup>	(-) <sup>**</sup>	0	0	0	0	0	0	0	0
Public debt/GDP	0	(+) <sup>*</sup>	(+) <sup>***</sup>	0	(+) <sup>**</sup>	(+) <sup>**</sup>	0	0	0	0	(+) <sup>***</sup>	0	(+) <sup>***</sup>	0
GDP per capita	(+) <sup>**</sup>	(+) <sup>***</sup>	0	(+) <sup>**</sup>	(+) <sup>***</sup>	0	(+) <sup>**</sup>	(+) <sup>***</sup>	(+) <sup>*</sup>	(+) <sup>***</sup>	0	(-) <sup>***</sup>	0	(-) <sup>***</sup>
Financial integration	(-) <sup>***</sup>	(-) <sup>***</sup>	0	(-) <sup>***</sup>	(-) <sup>***</sup>	0	(-) <sup>*</sup>	(-) <sup>**</sup>	(-) <sup>***</sup>	(-) <sup>**</sup>	0	0	0	0
Number of observations	522	522	522	522	522	522	522	522	522	522	348	348	348	348
X <sup>2</sup>	93.08	92.84	56.49	96.64	86.26	58.12	87.34	72.95	94.66	68.28	21.06	21.94	20.89	20.33
Probability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.03	0.04
Likelihood ratio	1.40	15.17	19.53	3.02	13.06	18.42	11.55	29.68	9.24	23.84	4.08	13.32	5.71	12.88
Probability	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.000	0.01	0.000

**Source:** Prepared by the authors, on the basis of their research results.

**Note:** The “-” sign means that the variable was statistically significant and had a negative sign, “+” that the variable was statistically significant and had a positive sign and “0” that the variable was not statistically significant, considering significance at 1%, 5% and 10%. LD = liability deceleration and AD = asset deceleration, with \*\*\* indicating significance at 1%, \*\* significance at 5% and \* significance at 10%. Standard errors clustered at the country level were used.

## V. Conclusions

This study has analysed phenomena associated with the movement of capital by non-residents (surge, stop, liability acceleration and liability deceleration) and residents (flight, retrenchment, asset acceleration and asset deceleration). In addition to investigating the role of global and domestic factors as drivers of these phenomena, the relationship with commodity prices in particular was tested.

The results show that emerging economies suffer a greater number of episodes of phenomena that reduce capital inflows or outflows than developed economies. These economies are more susceptible to reductions in financing, deterioration of the balance-of-payments current account and negative impacts on growth. At the same time, the results show that they are less likely to send large volumes of domestic wealth abroad.

The subprime mortgage crisis affected foreign capital inflows to emerging economies and had a dampening effect on domestic capital outflows. A prominent factor in the estimates was contagion at the regional level. This result shows that, if a situation produces fluctuations of capital movements in one economy, economies in the same region that perform similarly and are geographically close should prepare for the same trends.

A better understanding of the global factors related to the phenomena helps economies to implement macroeconomic policies that can limit the risk and instability caused by surges in capital inflows. After all, these phenomena affect the stability of capital movements, which is important for economic performance. Analysis of the determinants of capital movements points to the financial vulnerability of emerging economies to external factors, such as those occurring in the form of increased global risk, global liquidity and global growth. However, these variables do not influence the administration of those managing emerging economies, but knowledge of their influence on fluctuations in capital movements acts as a signal to these economies.

While external conditions put countries to the test, vulnerability is also driven by domestic factors. As noted in the previous section, all domestic factors (external debt, debt/GDP, GDP per capita and financial integration) influence the behaviour of resident and non-resident capital to some extent. This suggests that, if policymakers choose to increase external debt or even integrate more closely with other economies, a large amount of domestic capital may flow into the international financial system. On the other hand, if the policies adopted are reflected in an increase in the debt/GDP ratio, they act as a disincentive to capital outflows by domestic investors.

Over time, the performance of the external sector of countries' domestic economies has been influenced by both external financial cycles and fluctuations in the commodity cycle. The analysis conducted for all the countries in the sample allows us to conclude that there is indeed a relationship between commodity prices and episodes of resident capital movement phenomena. The results also show that this relationship becomes significant for non-resident capital when the study focuses on countries that export large volumes of commodities, such as soybeans, minerals and oil.

The study is limited by the availability of data on some domestic factors, such as indices of capital account openness. For future research, it is recommended that further work be done on differences in the responses of resident investors relative to non-resident investors.



## Bibliography

- Alberola, E., A. Erce and J. M. Serena (2016), “International reserves and gross capital flows dynamics”, *Journal of International Money and Finance*, vol. 60, February.
- Aldrighi, D. M. and A. D. Cardoso (2009), “Crises cambiais e financeiras: uma comparação entre América Latina e Leste Asiático”, *Economia e Sociedade*, vol. 18, No. 1, April.
- Barbosa Filho, F. H. (2017), “A crise econômica de 2014/2017”, *Estudos Avançados*, São Paulo, vol. 31, No. 89, April.
- Batista Junior, P. N. (2002), “Argentina: uma crise paradigmática”, *Estudos Avançados*, vol. 16, No. 44, January–April.
- Bredow, S. M., M. T. Lélis and A. M. Cunha (2016), “O ciclo de alta nos preços das *commodities* e a economia brasileira: uma análise dos mecanismos externos de transmissão entre 2002 e 2014”, *Economia e Sociedade*, vol. 25, No. 3, December.
- Bresser-Pereira, L. C. (2007), “Substituição de poupanças”, *Macroeconomia da estagnação: crítica da ortodoxia convencional no Brasil pós-1994*, São Paulo, Editora 34.
- Broner, F. and others (2013), “Gross capital flows: dynamics and crises”, *Journal of Monetary Economics*, vol. 60, No. 1, January.
- Caballero, R. J. and A. Krishnamurthy (2006), “Bubbles and capital flow volatility: causes and risk management”, *Journal of Monetary Economics*, vol. 53, January.
- Calvo, G. A. (1998), “Capital flows and capital-market crises: the simple economics of sudden stops”, *Journal of Applied Economics*, vol. 1, No. 1, November.
- Calvo, G. A., A. L. Izquierdo and L. F. Mejía (2008), “Systemic sudden stops: the relevance of balance-sheet effects and financial integration”, *NBER Working Paper*, No. 14026, Cambridge, National Bureau of Economic Research (NBER).
- (2004), “On the empirics of sudden stops: the relevance of balance-sheet effects”, *NBER Working Paper*, No. 10520, Cambridge, National Bureau of Economic Research (NBER).
- Calvo, G. A., L. Leiderman and C. M. Reinhart (1996), “Inflows of capital to developing countries in the 1990s”, *The Journal of Economic Perspectives*, vol. 10, No. 2.
- Cboe (Cboe Global Markets) (2017), “Settlement Prices” [online] [https://markets.cboe.com/us/futures/market\\_statistics/final\\_settlement\\_prices/](https://markets.cboe.com/us/futures/market_statistics/final_settlement_prices/) [accessed on 24 April 2022].
- Cowan, K. and J. De Gregorio (2005), “International borrowing, capital controls, and the exchange rate lessons from Chile”, *NBER Working Paper*, No. 11382, Cambridge, National Bureau of Economic Research (NBER).
- Fernández-Arias, E. (1996), “The new wave of private capital inflows: push or pull?”, *Journal of Development Economics*, vol. 48, No. 2.
- Forbes, K. J. and F. E. Warnock (2012), “Capital flow waves: surges, stops, flight, and retrenchment”, *Journal of International Economics*, vol. 88, No. 2, November.
- Fratzscher, M. (2012), “Capital flows, push versus pull factors and the global financial crisis”, *Journal of International Economics*, vol. 88, No. 2, November.
- Freitas, M. C. P. and D. M. Prates (1988), “Abertura financeira na América Latina: as experiências da Argentina, Brasil e México”, *Economia e Sociedade*, vol. 11, December.
- Frizo, P. and R. A. S. Lima (2014), “Efeitos da flutuação dos preços das *commodities* no fluxo de investimento estrangeiro direto no Brasil”, *Revista de Economia Contemporânea*, vol. 18, No. 3, September–December.
- Ghosh, A. R., J. D. Ostry and M. S. Qureshi (2016), “When do capital inflow surges end in tears?”, *American Economic Review*, vol. 106, No. 5, May.
- Ghosh, A. R. and others (2014), “Surges”, *Journal of International Economics*, vol. 92, No. 2, March.
- IMF (International Monetary Fund) (2017), “International Financial Statistics (IFS)” [online] <https://data.imf.org/?sk=4c514d48-b6ba-49ed-8ab9-52b0c1a0179b&slid=1409151240976> [accessed on 18 January 2017].
- (n.d.), World Economic Outlook Database [online] <https://www.imf.org/en/Publications/WEO/weo-database/2018/April/select-country-group> [accessed on 18 January 2017].
- Johnson, S. and others (2000), “Corporate governance in the Asian financial crisis”, *Journal of Financial Economics*, vol. 58, Nos. 1–2.
- Kim, Y. (2000), “Causes of capital flows in developing countries”, *Journal of International Money and Finance*, vol. 19, No. 2, April.

- Lane, P. R. and G. M. Milesi-Ferretti (2000), "External capital structure: theory and evidence", *IMF Working Paper*, No. 2000/152, Washington, D.C., International Monetary Fund (IMF).
- Liesenfeld, R., G. V. Moura and J. F. Richard (2010), "Determinants and dynamics of current account reversals: an empirical analysis", *Oxford Bulletin of Economics and Statistics*, vol. 72, No. 4, January.
- Milesi-Ferretti, G. M. and C. Tille (2011), "The great retrenchment: international capital flows during the global financial crisis", *Economic Policy*, vol. 26, No. 66, April.
- Munhoz, V. C. V. (2013), "Vulnerabilidade externa e controle de capitais no Brasil: uma análise das inter-relações entre câmbio, fluxos de capitais, IOF, juros e risco-país", *Nova Economia*, vol. 23, No. 2, May–August.
- Prates, D. M. (2007), "A alta recente dos preços das commodities", *Revista de Economia Política*, vol. 27, No. 3, September.
- \_\_\_\_\_(2005), "Resenha crítica - a literatura convencional sobre crises financeiras nos países 'emergentes': os modelos desenvolvidos nos anos 90", *Estudos Econômicos*, vol. 35, No. 2, June.
- Prates, D. M. and E. F. Marçal (2008), "O papel do ciclo de preços das commodities no desempenho recente das exportações brasileiras", *Revista Análise Econômica*, vol. 26, No. 49, March.
- Reinhart, C. M. and V. Reinhart (2009), "Capital flow bonanzas: an encompassing view of the past and present", *NBER International Seminar on Macroeconomics*, vol. 5, No. 1, J. Frankel and F. Gavazzi (eds.), Chicago, Chicago University Press.
- Reinhart, C. M., V. Reinhart and C. Trebesch (2016), "Global cycles: capital flows, commodities, and sovereign defaults, 1815–2015", *American Economic Review*, vol. 106, No. 5, May.
- Silva, G. J. C. and M. F. C. Resende (2010), "Eficácia dos controles de capitais no Brasil: uma abordagem teórica e empírica alternativa", *Estudos Econômicos*, vol. 40, No. 3, September.
- Silveira, M. A. C. and A. Moreira (2014), "Paradas e fugas súbitas dos fluxos de capital nos países emergentes: fatores globais e locais", *Texto para Discussão*, No. 1932, Rio de Janeiro, Institute of Applied Economic Research (IPEA).
- Sonaglio, C. M. and others (2010), "Evidências de desindustrialização no Brasil: uma análise com dados em painel", *Economia Aplicada*, vol. 14, No. 4, December.
- Veríssimo, M. P. and C. L. Xavier (2014), "Tipos de commodities, taxa de câmbio e crescimento econômico: Evidências da maldição dos recursos naturais para o Brasil", *Revista de Economia Contemporânea*, vol. 18, No. 2, August.
- World Bank and others (2016), "World Integrated Trade Solution (WITS)" [online] <https://wits.worldbank.org/> [accessed on 5 January 2018].