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Gross capital flows: Dynamics and crises

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ABSTRACT

This paper analyzes the behavior of international capital flows by foreign and domestic agents, dubbed gross capital flows, over the business cycle and during financial crises. We show that gross capital flows are very large and volatile, especially relative to net capital flows. When foreigners invest in a country, domestic agents invest abroad, and vice versa. Gross capital flows are also pro-cyclical. During expansions, foreigners invest more domestically and domestic agents invest more abroad. During crises, total gross flows collapse and there is a retrenchment in both inflows by foreigners and outflows by domestic agents. These patterns hold for different types of capital flows and crises. This evidence sheds light on the sources of fluctuations driving capital flows and helps discriminate among existing theories. Our findings seem consistent with crises affecting domestic and foreign agents asymmetrically, as would be the case under the presence of sovereign risk or asymmetric information.

1. Introduction

International capital flows have played an increasingly important role in the business cycles of high-income and middle-income countries, especially since the 1970s and during episodes of financial crises. As a consequence, a large literature has grown, analyzing the cyclical behavior of capital flows, mostly in emerging economies. This literature has concentrated on studying net capital flows, defined as the difference in gross capital flows, that is, the net purchases of domestic assets by foreign agents minus the net purchases of foreign assets by domestic agents.[1] The literature shows that net capital flows are volatile and pro-cyclical and decline during crisis times. These patterns are more extreme in upper-middle-income countries and have even motivated the use of the term "sudden stops" to refer to the large collapses in net capital inflows that often accompany crises.[2]

While net capital flows have attracted significant attention, much less is known about the behavior of gross capital flows. Yet, understanding the behavior of gross capital flows seems crucial, especially given that capital flows by foreign and domestic agents have become very important and are likely driven by different factors. For example, agents might invest directly in a firm located in a foreign country if they have access to a technology that is superior to that of domestic agents, a foreign asset might be more attractive to some agents if it provides a better hedge to their non-pledgeable labor income, or sovereign risk might make the return of an asset depend on the residency of the agent who holds it. As a result,

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[1] See for example, Dornbusch et al. (1995), Kaminsky et al. (1998), Broner and Rigobon (2006), Levchenko and Mauro (2007), and Mendoza (2010).
[2] See for example, Calvo (1998), Calvo et al. (2008), and Cavallo and Frankel (2008).

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it seems reasonable to expect that gross capital flows by foreign and domestic agents behave differently both over the cycle and during crises, as we in fact find in this paper.

Several papers analyze long-run trends in gross capital flows showing that the large flows have resulted in large gross international investment positions (Lane and Milesi-Ferretti, 2001, 2007; Kraay et al., 2005; Devereux, 2007; Gourinchas and Rey, 2007a, 2007b; Obstfeld, 2012). But there are few studies on the cyclical behavior of gross capital flows. The literature has so far mostly focused on characterizing episodes of abrupt reversals in capital inflows into those driven by foreign agents, or true sudden stops, and those driven by domestic agents, or episodes of capital flight (Powell et al., 2002; Faucette et al., 2005; Cowan et al., 2008; Janus and Riera-Crichton, 2009; Calvo, 2011; Rothenberg and Warnock, 2011; Forbes and Warnock, 2012; Calderon and Kubota, 2013). Other studies examine the behavior of particular types of gross capital flows during specific events (Frankel and Schmukler, 1996; Kim and Wei, 2002; Choe et al., 2005; Albuquerque et al., 2007; Milesi-Ferretti and Tille, 2010). Evidence for the U.S. suggests that there is a positive correlation between domestic purchases of foreign equity and foreign purchases of domestic equity (Dvorak, 2003; Hnatkovska, 2010; Tille and van Wincoop, 2010).

Because of the limited research on gross capital flows, many important questions remain unanswered. For example, are periods in which foreign agents purchase domestic assets also periods in which domestic agents sell foreign assets? Is there a positive or negative correlation between capital flows by foreign and domestic agents? What is the behavior of gross capital flows over the business cycle and during financial crises? We know that crises are associated with reductions in net capital inflows. But are these reductions on average due to sales of domestic assets by foreign agents, purchases of foreign assets by domestic agents, or both? How large and how volatile are gross capital flows relative to net capital flows? Do all types of gross capital flows behave similarly or are aggregate flows driven by particular flow types?

In this paper, we document a number of stylized facts about the dynamics of gross capital flows, which provide answers to the questions mentioned above. More specifically, we study the cyclical behavior of capital inflows by foreign agents (*CIF*) and capital outflows by domestic agents (*COD*), our two measures of *gross capital flows*.[3] Positive *CIF* and *COD* are both associated with increases in gross international investment positions. To construct *CIF* and *COD*, we use balance of payments data from the International Financial Statistics of the International Monetary Fund from 1970 to 2009 for 103 countries. *CIF* is equal to the net purchases of domestic assets by non-residents; namely, it is the sum of all liability inflows. *COD* is equal to the net purchases of foreign assets by domestic agents; in other words, it is the negative of the sum of all asset inflows including international reserves. *Net capital flows* are equal to the difference $CIF-COD$ and *total gross flows* are equal to the sum $CIF+COD$.

Our main findings are the following. (i) The magnitude and the volatility of gross capital flows (*CIF* and *COD*) are large both in absolute terms and relative to the size and the volatility of net capital flows. They have also increased over the four decades encompassing the 1970s to the 2000s, while the size and the volatility of net capital flows have remained stable. This reflects an increasingly positive correlation between *CIF* and *COD*. (ii) Gross capital flows are pro-cyclical. In other words, during expansions foreign agents increase their purchases of domestic assets and domestic agents increase their purchases of foreign assets. During contractions, the opposite occurs. Moreover, during crises, total gross capital flows collapse or *retrench*. (iii) Crises that occur during periods of global financial turbulence are associated with particularly large retrenchments. Moreover, retrenchments take place during banking, currency, and debt crises. (iv) These patterns reflect reductions in every type of gross capital flows during crises, including direct investments, other investments, portfolio debt, and portfolio equity. The behavior of reserves differs across income groups, playing an important role in the contraction of capital flows in middle-income countries and none in high-income ones.

These results have important implications for the theories of capital flows. Different classes of models make different predictions regarding the behavior of gross capital flows. Therefore, the evidence we provide in this paper helps discriminate among several of these existing theories. As we explain below, our findings seem consistent with crises affecting domestic and foreign agents asymmetrically, as would be the case under the presence of sovereign risk or asymmetric information.

The rest of the paper is organized as follows. Section 2 describes the data. Section 3 characterizes the comovement of capital flows by foreign and domestic agents. Section 4 analyzes the behavior of gross capital flows over the business cycle and during crises. Sections 5 and 6 show results for countries of different income groups and for different types of crises, respectively. Section 7 discusses some theoretical implications. Section 8 concludes.

2. Data

To document worldwide patterns of capital flows by domestic and foreign agents, we assemble a comprehensive data set on gross capital flows, including not only aggregate capital inflows and outflows, but also their components, reflecting the different flow types. The data come from the analytic presentation of the IMF's Balance of Payments Statistics Yearbooks (BOP).[4] The IMF's BOP data set provides country-level data, on an annual basis since 1970, on different types

[3] *CIF* and *COD* should not be confused with *gross* purchases of domestic assets by foreigners and *gross* purchases of foreign assets by domestic residents. Information on such gross asset trades is not consistently available from the balance of payments statistics for a large sample of countries.

[4] Debt refinancing and rescheduling entries, which involve changes in existing debt contracts or replacement by new ones generally with extended debt service payments, are excluded from our data set. In the analytic presentation of the IMF's BOP, the credit and debt entries derived from the new