



# International gross capital flows: New uses of balance of payments data and application to financial crises

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## Abstract

Most studies of international financial openness and crises link economic performance to either the net inflow of capital or the gross inflow (outflow) defined as the change in foreign (domestic) holdings of domestic (foreign) assets over a period. In this paper we decompose the net inflow into four rather than two components. We show that the four-way decomposition provides a better understanding of six recent financial crises and predicts sudden stops better than a standard two-way decomposition. We conclude that four-way decompositions can be more informative than either the net capital inflow or two-way decompositions of the net inflow.

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## 1. Introduction

With a supportive institutional framework, international capital flows and financial openness have the potential to advance economic growth, stability, and development. For instance, they can promote investment and financial development (Baldwin & Martin, 1999; Chinn & Ito, 2006) or even jump-start economic development (Murphy, Shleifer, & Vishny, 1989). When the institutional

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framework is weak, however, international capital flows and financial openness can lead to bubbles and financial crises (Prasad, Rogoff, Wei, & Kose, 2003).

A number of papers explore the economics of capital flows. However, most empirical (Bordo, Cavallo, & Meissner, 2010; Burnside, Eichenbaum, & Rebelo, 2004) as well as theoretical papers – including business cycle and growth studies (Aghion, Howitt, & Mayer-Foulkes, 2004; Barro, Mankiw, & Sala-i-Martin, 1992) as well as financial crisis models (Calvo, 1998; Dooley, 2000) – have focused on the net capital inflow. A smaller empirical literature, which we discuss below, distinguishes gross inflows and outflows of capital.<sup>1</sup> In this paper, however, we argue that a focus on either net flows or its component gross in- and outflows may be unnecessarily restrictive.

In order to express our departure from previous work, we note that the standard definition of the net capital inflow (NI) is  $NI = \Delta L - \Delta A$  where  $\Delta L$  ( $\Delta A$ ) is the increase in foreign (domestic) holdings of domestic (foreign) assets in the balance of payments (BoP) over the period.<sup>2</sup> The gross inflow (outflow) is  $\Delta L$  ( $\Delta A$ ). Although this definition seems intuitive, a sizable share of the BoP recorded changes in assets holdings (for various countries, years and asset categories), however, are actually negative.<sup>3</sup> A negative change in foreign (domestic) holdings of domestic (foreign) assets represents disinvestment in the domestic (foreign) economy. When the standard definition of the inflow (outflow),  $\Delta L$  ( $\Delta A$ ) simply adds the negative and positive changes across asset categories in the BoP – the categories are FDI, portfolio, and other capital flows – it fails to distinguish a fall in new foreign investment from a corresponding disinvestment. Since many countries face imperfections in financial markets, the implicit assumption that economy-wide foreign investment and disinvestment are perfect substitutes is unlikely to be correct. Intuitively, disinvestment is the disruption of an existing credit relationship, and if collateral or information is relationship-specific, it may be difficult for a borrower to find a new domestic or foreign lender despite a high social return to lending (Bernanke, 1983; Caballero & Krishnamurthy, 2001). Liquidity problems of industries hit by disinvestment shocks may spread via backward and forward linkages. For instance, Hendricks and Singhal (2005) find that supply-chain disruptions for US firms lead to cumulative abnormal stock market returns of  $-40\%$  over a three-year period starting one year before the disruption announcement.<sup>4</sup>

Given the potential asymmetries between foreign investment and disinvestment, we extract a disinvestment measure from the balance of payments using the identity

$$NI_4 = L^+ - L^- - A^+ + A^-, \quad (1)$$

$L^+ \geq 0$ : positive liability changes/inflowing foreign investment;  $L^- \geq 0$ : absolute value of negative liability changes/outflowing foreign disinvestment;  $A^+ \geq 0$ : positive asset changes/outflowing

<sup>1</sup> There may be several reasons to study gross capital flows. For one thing, if only net inflows mattered, then it is unclear why gross flows are many times larger. Inflowing capital may affect a country's output composition, technology or institutions differently from outflowing capital (Abiad, Oomes, & Ueda, 2008; Baldwin & Martin, 1999). In- and outflows may also differ according to risk, returns, and contractual lending terms (Mody & Murshid, 2005), and the liquidity and information sets of investors (Rothenberg & Warnock, 2011; Tille & Wincoop, 2008).

<sup>2</sup> See for example Ito (1999), Caballero, Cowan, and Kearns (2004), Alfaro, Kalemli-Ozcan, and Valosovych (2005), Faucette, Rothenberg, and Warnock (2005), Prasad and Wei (2005), Rothenberg and Warnock (2011), and Tille and Wincoop (2008).

<sup>3</sup> In our dataset, about 25% of recorded asset changes and more than 10% of liability changes are negative.

<sup>4</sup> Foreign disinvestments may also warn future investors to stay away or cause a fire-sale of assets exacerbating initial liquidity problems. Even if some domestic agents increase foreign credit access at the same time others lose it, leaving aggregate foreign lending unchanged, credit-unconstrained agents may be unwilling to lend to constrained agents (Caballero & Krishnamurthy, 2001).

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