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On the international transmission of shocks: Micro-evidence from mutual fund portfolios

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ABSTRACT

Using micro-level data on mutual funds from different financial centers investing in equity and bonds, this paper analyzes how investors and managers behave and transmit shocks across countries. The paper shows that the volatility of mutual fund investments is quantitatively driven by both the underlying investors and fund managers through (i) injections into/redemptions out of each fund and (ii) managerial changes in country weights and cash. Both investors and managers respond to country returns and crises and adjust their investments substantially, e.g., generating large reallocations during the global financial crisis. Their behavior tends to be pro-cyclical, reducing their exposure to countries during bad times and increasing it when conditions improve. Managers actively change country weights over time, although there is significant short-run pass-through from returns to country weights. Capital flows from mutual funds do not seem to have a stabilizing role and expose countries in their portfolios to foreign shocks.

1. Introduction

The global financial crisis of 2008 reignited interest in the behavior of financial intermediaries in both propelling risk taking and propagating shocks across markets and countries. In fact, several papers argue that financial intermediaries were at the core of the global financial crisis, as well as some of the previous crises in emerging economies. In particular, the international finance and finance literature stress that market participants tend to take too much risk during good times, and run and retrench when shocks hit the financial system.[1] Countries and companies can then become financially constrained as liquidity in the financial system dries up.

In a world where most savings are intermediated, two types of market participants become essential to understand the behavior of financial institutions: (i) the underlying investors delegating their assets to financial intermediaries and (ii) the managers allocating those assets. In the case of investments abroad, investors tend to channel the bulk of their assets through financial intermediaries dedicated to investing across countries, pouring funds into those institutions when they wish to diversify globally and withdrawing their funds when they favor local assets. Managers, in turn, need to deal with these shocks from investors as well as other shocks by deciding how much cash to accumulate and in which countries to invest. The shocks managers face can be large. For example, during the 1998 Russian crisis and the 2008 global crisis, financial institutions faced severe liquidity shortages and withdrawals from the investors, leading to the collapse of Long-Term Management Company (LTCM), Bear Stearns, and Lehman Brothers, and pushing the world financial system to the brink of a meltdown.

The link between the underlying investors and fund managers, partly driven by limited information and principal-agent problems, is important because it can profoundly affect portfolio allocations by financial institutions. This link exists because managers are monitored by investors (and their own supervisors) and respond to the incentives that this monitoring imposes on them. The relation between managers and investors is perhaps more obvious in the case of demandable

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[1] See Allen and Gale (2000, 2007), Chang and Velasco (2001), Cifuentes et al. (2005), Diamond and Rajan (2005), Rajan (2005), Calomiris (2008), Broner et al. (2010, forthcoming), Milesi-Ferretti and Tille (2010), Forbes and Warnock (2011), and Gourinchas and Obstfeld (2011), among many others.

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(redeemable) debt that affects banks and bond mutual funds (among others), where short-term rollover decisions by investors are strategic complements and condition managers that are involved in maturity transformation.[2] Bank runs are a good example of this because the incentives to run are correlated among depositors, given that their demandable claims (whose value is fixed in nominal terms) are returned on a first-come-first-served basis (Diamond and Dybvig, 1983).[3] Although the rush to get out first is attenuated for demandable equity (where the value of the claim moves in tandem with the value of the asset), fragility can exist even in this case. For instance, if investors have asymmetric information and flows to mutual funds are related to past returns, sudden price collapses can generate fire sales by investors (Shleifer and Vishny, 1997, 2011), which accentuate the price declines and provoke further liquidations. This serial correlation of returns due to funds selling assets at distressed prices provides incentives for investors to sell their claims as soon as possible and may result in run-like behavior.

The fact that investors can pull out their demandable (debt or equity) claims can generate incentives for managers to avoid long-run arbitrage opportunities, herd, and deviate from the optimal portfolios for the underlying investors (Scharfstein and Stein, 1990; Stein, 2005, 2009). For example, in the case of mutual funds, open-end structures allow investors to monitor managers on a short-term basis and discipline them if they behave badly, but this short-run monitoring may constrain managers, limiting their ability to take long-run positions. Namely, managers might not buy assets during crises that are likely to pay off in the long run because they can suffer short-term withdrawals from the underlying investors. Agency problems might thus lead to short-term structures, vulnerability, fire sales by investors and managers, and contagion.

While the literature argues that the supply side of funds and, in particular, the actions of managers and investors are important in the transmission of shocks, detailed and direct evidence on how financial intermediaries behave in their international investments is rather limited. Some papers analyze the case of bank flows, whereas others study mutual fund flows across countries.[4] Although informative about the behavior of institutional investors, these studies tend to focus on aggregate capital flows into different countries. Therefore, they miss important micro aspects of the inner-workings of financial institutions that are essential to understand how financial intermediaries invest, react to shocks, and transmit crises.

One paper that stands out in the recent literature and is closely linked to our paper is Jotikasthira et al. (forthcoming). Their paper shows that movements in investor flows force significant reallocations in equity fund portfolios related to emerging markets, which in turn affect equity returns, correlations among emerging markets, and the developed market betas of emerging markets. These effects are particularly acute during periods of financial distress. Their paper provides important evidence on the role that mutual funds play in emerging markets and how they transmit shocks across international markets through their impact on returns. Two other earlier exceptions that are also good complements to our paper are Kaminsky et al. (2004) and Hau and Rey (2008). Kaminsky et al. (2004) study momentum trading by investors and managers. Hau and Rey (2008) use data on equity funds to analyze whether foreign exchange and equity risk measures trigger rebalancing behavior at the fund and stock level.[5]

In this paper, we use a micro-level dataset on international mutual funds to shed new light on how investors and managers react to shocks and crises and how they impact capital flows through their investment reallocations across developed and emerging countries. International mutual funds are especially useful because they enable us to analyze separately: (i) injections/redemptions driven by the underlying investors; (ii) actual portfolios across countries that are allocated and rebalanced at the sole discretion of managers (and do not need to be inferred from other data); (iii) their interactions (how investors monitor managers); and (iv) the relative contribution of investors and managers to capital flows.[6] The main data consist of portfolio weights and assets invested in each country around the world for 1076 equity and bond mutual funds on a monthly basis during 15 years, from January 1996 to November 2010. The data cover portfolio allocations to 124 developed and emerging countries and cash, plus fund returns that allow us to obtain injections and redemptions into each fund.

We explore several questions of interest. How volatile is the mutual fund investment across countries? How can mutual funds help transmit crises? What was their specific behavior during the global crisis of 2008? What is the role of investors and managers? How volatile are injections? To what degree do weights remain constant over time? To the extent that weights change, how much are they the cause of valuation effects versus actual buying/selling in different countries or regions? How long does it take for weights to adjust to shocks? How are cash positions used? Are there differences between bond and equity funds? Are capital flows and retrenchments largely driven by inflows into and out of investment funds by the underlying investors that lead managers to liquidate positions across countries to maintain portfolio weights, or by active changes in these country weights by fund managers?

The main results of the paper can be summarized as follows. Mutual fund assets fluctuate substantially and pro-cyclically over time. Both the underlying investors and managers are behind these movements, retrenching from countries in bad times and investing more in good times. In the case of the underlying investors, fund performance and wealth effects (driven by shocks at home) seem to have a direct impact on how much they invest in international mutual funds. When shocks are correlated across countries, like during the global crisis, they do not act as deep-pocket international investors buying assets abroad at fire-sale prices. The investor behavior exerts pressure on managers, who need to react to this pressure as well as to shocks to returns (or valuation effects). In the short run, managers allow shocks to returns to pass through to country weights, with the latter changing substantially over time. Over the long run, weights deviate from the pass-through effects. While during normal times managers do not allow the pass-through to be complete (in relative terms, they reallocate a small fraction to countries that are doing badly), they behave pro-cyclically during crises, moving away from countries in turmoil. This pro-cyclicality is observed particularly in equity funds. The behavior of both managers and investors has a direct effect on capital flows to countries around the world. In sum, neither managers nor investors are contrarian, especially during crises, and their behavior seems to amplify crises and transmit shocks across countries.

[2] More specifically, when one investor withdraws financing, banks and bond mutual funds are more likely to run into trouble. Therefore, other things equal, other investors have more incentives to withdraw financing as well. The decisions by investors are strategic complements (Bulow et al., 1985).

[3] The maturity mismatch and the possibility of a run constitute a source of fragility as liquidity may suddenly vanish (Brunnermeier, 2009; Shin, 2009; Raddatz, 2010; Gorton and Metrick, 2012). Vulnerability can be exacerbated under the presence of leverage, where margin calls can also trigger collapses. See, for example, Calvo (2002), Kodres and Pritsker (2002), Mendoza and Smith (2006), and Mendoza (2010).

[4] See, for example, Borensztein and Gelos (2003), Martinez Peria et al. (2005), Broner et al. (2006), Hau and Rey (2006), Cetorelli and Goldberg (2011), and Fratzscher (2011).

[5] A much larger finance literature studies other aspects of the behavior of mutual funds at the domestic and international levels. See, for example, Grinblatt et al. (1995), Wermers (1999), and Gompers and Metrick (2001) for U.S. domestic funds, and Kang and Stulz (1997), Dahlquist and Robertsson (2001), Kim and Wei (2002), Chan et al. (2005), Gelos and Wei (2005), and Didier et al. (2010) for international funds.

[6] Henceforth, we sometimes use the term "injections" to refer to both injections and redemptions (negative injections).