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Are all forms of financial integration equally risky? Asset price contagion during the global financial crisis

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ABSTRACT

Using the 2008–2009 global financial crisis, this paper examines the role of different forms of international financial integration for asset price contagion in crisis times. The analysis uses bilateral financial and trade linkages and daily data on equity and bond prices for a sample of 46 countries between 2002 and 2011. Bilateral debt integration and common bank lenders are found to have transmitted financial turmoil through equity and bond markets at the height of the crisis. During this period, real trade linkages also increased equity price co-movements. By contrast, no robust evidence is found that equity or FDI integration increased asset price co-movements during the crisis.

1. Introduction

The global financial crisis has highlighted that financial turmoil can spread rapidly, as became visible e.g. in synchronised, large asset price movements across countries (Bunda et al., 2010; Frank and Hesse, 2009). Apart from an increasing correlation of economic fundamentals during financial crises, correlations in asset prices could also increase because of contagion. The strength of contagion, in turn, may depend on financial linkages between countries, and the form through which such financial integration occurs (Didier et al., 2008). This paper examines whether the depth and type of cross-border financial integration may lead to asset price contagion, based on a difference-in-differences identification strategy and looking at asset price co-movements prior to and during the 2007–2009 global financial crisis.

Contagion can be expected to lead to an increase in co-movement of returns for certain country pairs, but not others, and our empirical strategy aims at disentangling the role of different forms of contagion during the global financial crisis. Financial contagion is measured as the transmission of financial market movements beyond the co-movements that would occur in "tranquil" times (Forbes and Rigobon, 2002). For instance, contagion through bilateral debt integration is inferred if asset price co-movements increase more during the crisis between country pairs that hold large shares of their external debt, relative to country pairs whose external debt is mainly held by third-party countries. Similarly, when the banking systems of two countries have a common lender, there is no reason for correlation in returns between the two debtor countries in normal times. However, during the crisis, capital and liquidity shocks in international banking centres may have generated large co-movement among debtor countries.

A large body of both theoretical and empirical work, reviewed e.g. in Kaminsky et al. (2003), explores how financial turmoil is transmitted. Beyond the possibility that the spreading of financial turmoil may be caused by common shocks, the literature has identified real trade and financial linkages as the main mechanisms of bilateral crisis transmission across countries. Both linkages can work directly or indirectly.[1] Direct trade effects arise, for example,

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[1] Financial and trade channels may not operate independently. For example, the co-movements of equity stocks may depend both on export prospects and firms' dependence on international trade finance. Focusing on the United States,

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when a negative shock to a country's trading partner negatively affects the country's exports, which in turn may increase the co-movement of equity markets in the two countries. Indirect trade effects can occur when crisis-driven currency devaluation that (temporarily) increases a country's competitiveness negatively affects its trade competitors (Gerlach and Smets, 1995; di Giovanni and Levchenko, 2010), thereby increasing co-movement of their equity markets. During the recent crisis, the size of trade shocks dwarfed historical levels which could partly explain particularly high financial asset co-movements during this period (Levchenko et al., 2010a,b). Other studies have emphasised the role of financial linkages in contagion. The so-called "wake-up call" hypothesis relies on information asymmetries in financial markets to explain financial contagion: a crisis in one country can push investors to re-evaluate the riskiness of their asset holdings in countries with similar vulnerabilities, or about which they have only limited information. Information asymmetries about asset quality have been shown both theoretically (Caballero and Simsek, 2009) and empirically (de Haas and van Horen, 2011) to be especially important in crisis times.

The deterioration of countries' balance sheets due to capital losses on external assets may also cause contagion, with effects being amplified by financial integration. International transmission of shocks on asset prices through the balance sheets of leveraged financial intermediaries has been referred to as the "international financial multiplier" (Krugman, 2008). Domestic banks that make loans to foreign entrepreneurs will see their balance sheet negatively affected when the foreign country is hit by a shock. If these banks have to satisfy prudential regulations, such as capital adequacy requirements, they may respond to increased losses on their foreign loan portfolio by reducing the supply of credit to both domestic and foreign borrowers, thereby potentially transmitting weakness in foreign equity prices to the domestic market. Didier et al. (2012) and Kalemli-Ozcan et al. (2011) find that countries with a higher level of banking integration with the United States had higher equity-price and output co-movement with the United States during the recent crisis.[2] Similarly, banks may react to losses in one foreign country by reducing credit to this and other foreign countries, thereby creating common-creditor contagion among their debtor countries. These shocks can generate monsoonal effects in emerging markets when common vulnerabilities, such as exposure to a common lender and unstable domestic banking systems, lead some countries to react similarly to a crisis in advanced economies (Masson, 1998).

The strength of contagion may also depend on the form of financial integration. Risks to financial stability from debt and banking integration are generally thought to differ from those of equity and – in particular – FDI integration:

- Holders of debt or loans are likely to have an inferior knowledge of their assets than equity and especially FDI investors, increasing uncertainty-aversion driven sales in times of financial turmoil (Ahrend and Schwellnus, 2012).
- Holders of debt assets or loans may be more credit-constrained in situations of financial turmoil than – often less leveraged – holders of foreign equity and especially FDI (Davis, 2011).
- Foreign banks may reduce their cross-border exposure by not rolling-over existing loans.
- As debt and equity are more liquid than FDI, distressed investors can sell these assets more easily. This may feed fire-sale dynamics that sees deteriorations in asset prices and thereby in balance sheets resulting in the need for further sales.

The contribution of this paper to the literature on contagion is twofold: first, existing studies mostly explore correlations with one "main" crisis country or examine the international propagation of shocks from high-income countries to developing countries.[3] For example, the available empirical evidence on contagion during the latest financial crisis largely focuses on the effects of financial integration with the United States on domestic equity markets (Bekaert et al., 2011; Didier et al., 2012; Rose and Spiegel, 2010).[4] In contrast, this paper examines bilateral asset price co-movements for a large sample of developed and developing economies and distinguishes between the initial spread of the crisis from the United States and its transmission across third-party countries. Second, as emphasised by new theoretical models of international business cycles (Devereux and Yetman, 2010; Davis, 2011), different forms of financial integration could have different implications for financial co-movements. This work therefore examines the empirical importance for financial contagion risk of different financial bilateral linkages through cross-border equity and FDI ownership, or credit market integration.

More precisely, using daily equity and bond prices, the empirical analysis builds bilateral measures of co-movements between asset prices. It then explores whether different forms of bilateral integration have influenced the difference in co-movements of equity and bond prices during the latest financial crisis and during "normal" times. Controlling for country-pair time-invariant characteristics that could affect both financial co-movements and bilateral asset holdings, this difference-in-differences identification strategy disentangles the increases in bilateral co-movements of financial markets that may be due to bilateral linkages from those due to common global shocks, or changes in asset-price volatility. Importantly, in addition to considering financial and trade linkages, the specification also controls for bilateral distance and similarity of industrial structure. Both of these variables have been shown to partly determine bilateral asset holdings (e.g. Lane and Milesi-Ferretti, 2008; Ahrend and Schwellnus, 2012) and could be associated with an increase in asset price co-movements during the crisis.

The main results of the empirical analysis are as follows:

- Bilateral debt integration, i.e. the share of the external debt of both countries held within the country-pair, is found to have strongly amplified asset price contagion during the global financial crisis in both equity and bond markets. The impact of debt on contagion appears stronger when we focus on the spread of the crisis excluding the United States, highlighting the issue of bilateral debt integration across European countries. In contrast, little robust evidence is found that equity and FDI integration increased asset-price contagion.

Levchenko et al. (2010a,b) find no evidence that trade credit and other financial factors played a role in the collapse of US exports during the crisis. However, their results contradict the evidence in Amiti and Weinstein (2009) and Ahn et al. (2011) that suggests a causal role of finance for trade.

[2] Boyer et al. (2006) provide more comprehensive, but indirect evidence in favour of this mechanism by comparing correlations of stock market returns accessible to foreigners and non-accessible to foreigners.

[3] For example, Kaminsky and Reinhart (2001), Van Rijckeghem and Weder (2001) and Didier et al. (2012) focus on historical crisis episodes and define the mechanism of propagation as originating in one country (Russia, Mexico, Thailand or the United States for the recent financial crisis).

[4] A related literature explores the relationship between cross-border bank lending and banks' behaviour during the crisis (Cetorelli and Goldberg, 2011; de Haas and van Horen, 2011).