

Currency crisis contagion and the identification of transmission channels[☆]

Fasika Haile^a, Susan Pozo^{b,*}

^a Comerica Bank, United States

^b Department of Economics, Western Michigan University, 1903 W. Michigan Avenue, Kalamazoo, MI 49008, United States

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Abstract

Using quarterly data (1960–1998) for a set of 37 advanced and emerging market economies we find that countries face currency crises because of unsustainable macroeconomics fundamentals and contagion. In most cases considered, contagion works via the trade channel. In addition, the estimation results reveal that the probability of a crisis in a given country increases as the number of its neighboring countries in crisis increases implying the presence of neighborhood effects in the contagious spread of crisis. Our results also lend limited support to the notion that there is some contagion through capital markets.

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1. Introduction

The main objective of this paper is to test whether currency crises are contagious and to identify the channels through which crises are transmitted across countries. Many economists have now realized that a role was played by contagion in propagating the currency crises of emerging market economies in the 1990s. Different theoretical models have been recently developed suggesting different mechanisms by which crises have been transmitted across countries. But there is relatively little empirical consensus on how crises spillover across countries while the frequency and intensity of crises points to the urgency of additional empirical works to come up with solutions for crisis prevention, crisis management and crisis resolution¹.

Currency crises prior to 1990s did not appear to spread across countries with the virulence and speed observed recently. The earlier literature tried to explain the crises as the result of inconsistencies between fiscal and monetary policies and the existing exchange rate commitment (so called first generation models of currency crisis such as

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* Corresponding author. Tel.: +1 269 387 5553; fax: +1 269 387 5637.

E-mail address: susan.pozo@wmich.edu (S. Pozo).

¹ See White (2000) for the different solutions suggested in the literature with respect to these three objectives: prevention, management and resolution.

Krugman, 1979). The collapse of the European Exchange Rate Mechanism (ERM) in 1992/93, the Mexican Peso crisis in 1994 and the Asian crisis in 1997 have, however, shifted the focus to models based on self-fulfilling expectations (Obstfeld, 1995) and on contagion (see Dornbusch, Park, & Claessens, 2000; Pericoli & Sbracia, 2003; Wolf, 1999 for a comprehensive survey of models of contagion).

The Asian financial crisis, for example, began in July 1997 with the Thai baht devaluation. It then spread to Malaysia, the Philippines, and Indonesia in the third quarter of 1997. Prior to the 1997 crisis, all these countries had a few common characteristics: an appreciating real exchange rate, large current account deficits and financial sector squeezes linked to overexposure to a property market whose prices had fallen sharply (see Krugman, 1998; Masson, 2004, 1999). But the currency pressures also quickly spread to Hong Kong, Singapore and Korea, economies with strong current account and fiscal positions. The crisis even jumped surprisingly to several emerging markets outside the region, notably to Brazil and Russia (see IMF, 1998, 2001). This experience coupled with the earlier crises in 1992/1993 and 1994/1995 led economists to suspect that crises in the 1990s were contagious.

In response to these events, several different theoretical models have been developed showing how crises end up spreading across countries. Some of the major models of contagion are based on trade linkage and macroeconomic similarities (Eichengreen, Rose, & Wyplosz, 1996; Gerlach & Smets, 1995; Goldstein, 1998), while other models are based on financial linkage, neighborhood effects, and exogenous shifts in investors' beliefs (herd behavior) (Calvo, 2005; Calvo & Mendoza, 2000; Kaminsky & Reinhart, 2000; Masson, 2004, 1999). Despite the explosion of models of contagion, there still lacks a general consensus on empirical findings on the relevant contagion channels.

Existence of contagion has important implications. Because no open economy can insulate itself from what is happening in the rest of the world, to prevent contagious financial crises countries may need to adopt regionally or globally coordinated measures. But the specific measures that should be taken to prevent the spread of financial crisis presuppose knowledge of the relevant contagion channels.

If the trade contagion channel is relevant, countries may need to diversify their trade and/or fix their exchange rates collectively in order to avoid speculative attacks following loss of international competitiveness. At the extreme, international cooperation of the countries may lead to the creation of a common currency. If, on the other hand, the financial contagion channel is relevant, countries may need to impose capital controls. Others suggest that a lender of last resort, such as the World Bank or the IMF, would need to be instituted to neutralize the financial contagion channel by providing liquidity support.

As the foregoing discussion points out, the intensity and time clustering of the crises has now forced both policy makers and academics to focus on contagion as a principal culprit in the ensuing discussion. A number of questions have been raised in the literature. Why do currency and financial crises hit selected countries within a very close time period? Are those countries simultaneously under crisis hit by common shocks? Or do they have unsustainable fiscal and monetary policies or unsustainable current account positions to the extent that both countries face crises simultaneously? If each of these is not the case, why and how does a crisis in one country transmit to other selected countries that have sound macroeconomic fundamentals?

This paper is motivated by some of the above questions. More specifically, the paper addresses two interrelated questions (i) does a currency crisis in one country spread to other selected countries? (ii) What are the channels through which crisis spreads across countries? To address these questions, the paper estimates a panel probit model as in Eichengreen et al. (1996). A probit model is estimated because it allows us to test for the existence of contagion while also empirically identifying the transmission channels.

However, this paper is different from the Eichengreen et al. (1996) approach in at least two ways. First, the test for contagion is undertaken using crises identified by the extreme value theory. This represents a significant deviation from prior works in this area that employ ad hoc procedures to define crisis periods. The "standard" approach is to set a threshold constructed from the mean and standard deviations of an index measuring speculative pressures. Values of the index above this threshold are taken as indicators of crises. But there appears to be no consensus on the specification of the threshold applied (e.g., global mean plus 1.5 standard deviations as in Eichengreen et al., 1996 vs. country specific mean plus 3 standard deviations as in Kaminsky & Reinhart, 2000). We employ a more objective method by defining currency crisis periods using the extreme value theory.

This paper differs from Eichengreen et al. (1996) in a second way, as well. We add countries from Asia and Latin America to the OECD sample of Eichengreen et al. (1996) to form an expanded data set representing many different regions of the world. This allows for testing contagion on a broader basis while also allowing for contagion to operate through a fourth channel — the neighborhood channel. Using the objectively identified crises, the paper, therefore,

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