CONTAGION

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Abstract

This contribution focuses on the debate concerning the definition of contagion. In literature there is not a uniform definition of what contagion constitutes. The idea that financial and currency crises cause structural breaks in international transmission mechanisms is opposed to the one that transmission mechanisms are the same during crises and during stable period. According to recent econometric findings the increases in correlation coefficients of stocks, interest and exchange rates - which are qualified as contagion - are due only to the excess of volatility in the markets that is reflected in a bias upward in the results of the most common econometric tests. Therefore there was virtually no contagion during most of crises episodes proving that countries are highly interdependent in all states of the world.

Since the Asian crisis in 1997 the term contagion has been referred to the spread of financial turmoil across countries. Among economists there is little agreement on what exactly the term contagion entails. The exam of the literature provides three prevailing definitions[2]:

1. Fundamental base contagion (interdependence): the contagion is the transmission of global or local shocks across countries through fundamentals

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[2]Pericoli and Sbracia (2001) include five different definitions, the two missed in this paragraph are i) "*contagion is a significant increase in the probability of a crisis in one country conditional on a crisis occurring in another country*" and ii) "*contagion occurs when volatility spills over from the crisis country to the financial markets of other countries*".

(spillover effects). According to this definition contagion could arise also during stable periods (Calvo e Reinhart (1996), Pristker (2000));

2. Excess of co-movements: the contagion is the transmission of global or local shocks across countries through mechanisms that not include fundamentals. This type of contagion is considered to be caused by "irrational" phenomena, such as financial panic, herd behaviour, increase in risk aversion or a loss of confidence (Claessens, Dornbusch, Park (2001), Jeanne and Masson (1998));

3. Shift contagion: the contagion is a significant change in cross-market linkages after a shock to an individual country (or group of countries). (Forbes and Rigobon (1998)).

The transmission mechanisms underling the three definitions could be represented by the following model, partly taken from Forbes and Rigobon (1999), Pristker (2001) and Pericoli and Sbracia (2001):

$$X_{i,t} = \alpha_i + \beta_i X_t + \gamma_i a_t + \varepsilon_{i,t} \tag{1}$$

where:

$x_{i,t}$ is the **stock** price in country i at time t,

X_t is the vector of stocks prices $x_{j,t}$ in countries different from I $(j \neq i)$,

a_t is a common aggregate shock linked to fundamentals, and

$\varepsilon_{i,t}$ is an idiosyncratic and independent shock.

On the basis of this equation, it is possible to show how transmission mechanisms work according to the three different definitions of contagion:

the first transmission mechanism of aggregated or specific shocks is measured by a_t and X_t, and the direct effect of these shocks on each country i is embodied respectively by γ_i and β_i.

the second transmission mechanism is measured by the correlation of idiosyncratic shocks of different countries $\varepsilon_{i,t}$, it is interpreted as contagion because there is excess of co-movements that cannot be explained by fundamentals;

the third transmission mechanism is measured by a shift in cross-market linkages and therefore is embodied in changes in both parameters β_i and γ_i (i.e. structural

break).

The first definition, as noticed by Claessens, Dornbusch and Park (2001), should not be properly considered as contagion. Therefore, it reflects the interdependence that exists in each state of the world among countries. According to the interdependence definition, global or local shocks are transmitted internationally by financial or real channels [3].

The second definition, as noticed in Pritsker (2001) [4], presents two orders of problems: the first is that the finding of contagion can always be questioned on the basis that the correct set of fundamentals was not controlled for (i.e. omitted variables problem). The second is related to the possibility that contagion occurs through a channel that Kodres e Pritsker (2000) refer to as "cross market hedging".

In the cross market hedging models some operators receive information (information shock) about country-specific components. After the shock the informed operators will optimally alter their portfolio for the country where the shock occurred. But they will also hedge the change in their macroeconomic **risk** exposures by rebalancing in other countries. The rebalancing transmits the idiosyncratic shock across markets, generating correlation in short-run stock returns.

First, the test for shift contagion is a test of the effectiveness of international diversification in reducing the portfolio risk during a crisis. In fact, if shift contagion occurs after a negative shock it would undermine much of the rationale for international diversification.

Second, the definition is useful in evaluating the role and potential effectiveness of international institution and bailout funds. If shift contagion occurs the transmission mechanisms of the financial crisis do not involve the macroeconomic fundamentals. Thus there will not be any endogenous adjustment process and the intervention of the international organisation is necessary. On the contrary if we are not in presence

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[3]The others two categories occur when the transmission of a crisis cannot be linked to observed changes in fundamentals and result solely from the behavior of investors or other financial agents.
[4]"*I prefer a broad definition because the economics profession will probably never reach agreement on the appropriate set of fundamentals which are needed to make a narrow definition operational*".

of shift contagion the intervention of the international organisation could be an obstacle to the endogenous adjustment process of the economies.

Third, tests based on this definition provide a useful method to classify theories as those that entail either a change in propagation mechanisms after a shock (crisis-contingent theories) versus those which are a continuation of existing mechanisms (non crisis contingent theories).

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