



Research Paper

The International Transmission Mechanisms of Crisis-Based and Non-Crisis-Based Shocks

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ABSTRACT

International shocks are important sources of cross-border crises, spillovers, and comovements. Besides, the increasing interdependences and interlinkages between the economies of the world have increased the importance of international shocks. These facts necessitate examining the transmission mechanisms of international shocks. To achieve this objective, this paper examines the two main classes of shocks shown in the literature: crisis-based and non-crisis-based shocks. The paper provides key facts on the transmission mechanisms of the examined shocks and suggests areas for future research.

KEYWORDS: International shocks; crisis-based shocks; non-crisis-based shocks

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I. INTRODUCTION

Over the years, international shocks, defined as unexpected and large variations in economic and financial variables, have affected countries, regions, and the global economy with varied signs (i.e. negative or positive), magnitude, speed of transmission, and persistence. The increasing globalization of the economies of the world in form of rising trade and financial flows has even increased the importance of international shocks in domestic economies. Consequently, shocks have received considerable attention in the literature.

The objective of this paper is to examine the international transmission mechanisms of the two broad categories of shocks shown in the literature, namely crisis-based and non-crisis based shocks, with some weight given to oil-related shocks under the discussion of the non-crisis-based theories, due to the dominant role of oil in cross-border transmission of shocks.

The paper presents a synthesis of the transmission mechanisms of international shocks, draws relevant conclusions, and indicates areas for future research. The remaining part of the paper is structured as follows: Sections two and three focus on crisis-based and non-crisis-based shocks, while concluding remarks are presented in section four.

II. CRISIS-BASED SHOCKS

The main factor driving a crisis-based shock is some “disaster” in the economy from which it originates. The disaster eventually leads to the transmission of economic or/and financial fluctuations from the affected country into other countries. The transmission of crisis between countries (or between the sectors/markets of a single country) is called contagion. Contagion has been defined variously in the literature. Dornbusch, Park and Claessens (2000) define contagion as an increase in cross-market comovement during a crisis episode. On the other hand, Edwards (2000) defines the concept as a condition in which the actual level of the transmission of international shocks is above the level expected by market agents. As argued by Edwards, this “residual-related” definition is consistent with the concept of contagion in the epidemiological literature, where the actual level of the manifestation of a disease above the expected level is regarded as contagion.

The central point of the argument of Edwards (2000) is that the residual-based definition means that pure contagion occurs when there are internationally transmitted shocks that are not *global shocks* or *shocks from related economies*. As the author explains, the global shocks, like the global recession of 2007-2009, are the ones that affect the world economy as a whole; while the shocks from related economies are based on interdependence or similarity of features between the origins and destinations of shocks, such as the case of shocks between trade partners or shocks between emerging markets. This implies that pure contagion occurs

when international shocks excluding global shocks and shocks from related economies are transmitted during crisis. Pure contagion is therefore measured by the correlation existing between economies during crisis that is not explained by fundamentals.

The notion of contagion in Edward (2000) is consistent with the one in Masson (1998), in that the latter also distinguishes among contagion, global shocks, and shocks from related economies. Based on these two studies, we therefore have three main forms of international shocks, which may be measured through fundamentals and non-fundamentals accordingly: (i) Global or common shocks which can be measured through fundamentals.¹ (ii) Shocks from related or interdependent economies, which can also be measured through fundamentals.² As shown by Dornbusch, Park and Claessens (2000), these two forms of shocks would only cause contagion (i.e. fundamentals-based contagion) when they are associated with a crisis, as the shocks may take place both in crisis and tranquil times. (iii) Pure contagion, which is based on the behaviour of economic or market agents, reflecting that they are explained by non-fundamentals and not fundamentals. In line with the foregoing explanations, the crisis-based shocks in the literature are discussed under two broad classes as follows:

2.1. Agent-Based Contagion

As noted above, this form of contagion, which is the cross-country transmission of a crisis without any observed variations in macroeconomic fundamentals, is called pure contagion. The key channels of this form of contagion as shown in the literature include the following:

2.1.1. Multiple Equilibria

Basically, multiple equilibria points to an abnormal market condition in which there are more than one equilibrium, because the supply curve cuts the demand curve more than once. This implies there are more than one market clearing price. In a multiple equilibria framework, contagion occurs when a crisis in one economy shifts another economy from a good to a bad equilibrium regardless of the state of the macroeconomic fundamentals. The shift to a bad equilibrium points to crisis in the second economy. This shift is due to changes in the expectations of economic agents in the second economy, due to the crisis in the first economy, leading to coincidence of crises in the two economies.

The crisis in the first economy causes a change in the investors' beliefs in the second economy, causing agents to sell their assets in the latter economy, despite the fact that there are no observed changes in its macroeconomic fundamentals. Examples of studies involving multiple equilibria are Masson (1998) and Jeanne (1997). These studies are useful in explaining phenomena like speculative attacks on economies with sound macroeconomic fundamentals.

2.1.2. Endogenous Liquidity

Endogenous liquidity models argue that contagion is a consequence of international liquidity constraints initiated by a crisis in one country. For example, a crisis in one country may lead to a decrease in the liquidity of investors in the crisis country and force them to sell their assets in neighbouring countries to meet regulatory requirements to stay in the crisis-hit economy, leading to a crisis in the neighbouring countries. Examples of studies on endogenous liquidity are Valdes (1998) and Calvo (1999).

As this explanation shows, endogenous liquidity is different from exogenous liquidity. The former refers to the liquidity inherent in the assets of the investors, which may be called inside liquidity. On the other hand, exogenous liquidity is associated with the liability structure of investors, such as their ability to borrow, which may be called outside liquidity.

2.1.3. Herding

Herding points to the mutual behaviour of the individuals in a group without any pre-planned direction. Therefore, herding makes a crisis in a country to be transmitted into another country when economic agents in the latter follow the behaviour of agents in the former. For example, investors in a crisis-free country can relocate their assets to a particular country because investors in a crisis-hit country move their assets to the same country in response to crisis, so that crisis eventually hits the country that is initially crisis-free due to the relocation of assets. Examples of studies on herding are Calvo and Mendoza (2000) and Cipriani and Guarino (2010).

¹Masson (1998) shows that common shocks can also take place when the policy actions of advanced economies have common effects on emerging markets. This makes the nature of the shocks global, since the economies of the world may be broadly divided into industrial and emerging groups. The author gives the term "monsoonal effects" to this type of shocks.

² Masson (1998) terms this type of shocks as "spillovers."

Herding is associated with informational cascade, which occurs when certain agents follow the behaviour of other agents, because the former agents believe that the latter ones have better information. Therefore, herding models are basically social learning models involving agents obtaining information and learning from the behaviour of others, with the actions of agents revealing their private information and initiating public beliefs and common choices (Gale, 1996; Chamley, 2004). However, if responding agents move contrary to the behaviour of agents that should be followed, contrarianism occurs instead of herding.

2.2. Fundamentals-Based Contagion

Fundamentals-based contagion is related to the transmission of world or local shocks between countries due to trade and/or financial linkages. A key feature of this form of contagion is the negative effects of the crisis underlying the transmission of shocks. This is because in tranquil times shocks associated with normal trade and financial interdependence among countries may have positive effects, but in crisis periods such effects may be negative.

Examples of studies on fundamentals-based contagion are Pristker (2000) and Chang and Majnoni (2000). For instance, Chang and Majnoni (2000) present a model involving a country rolling over foreign debt, with the possibility of both fundamentals and self-fulfilling expectations of market agents causing contagion. In the model, there is an opportunity cost to the government of the domestic economy of obtaining foreign funds by selling new debt, which is associated to the returns of the alternative investments of foreign investors.

Therefore, a crisis in foreign economies such as a monetary policy shock in industrial economies can increase the opportunity cost of foreign funds and cause the domestic economy to experience contagion, which is equivalent to what Masson (1998) terms “monsoonal effects.” Besides, a shock in an economy similar in nature to the domestic economy (e.g. a shock between two emerging markets) can also increase the opportunity cost and cause contagion in the home economy, which is what Masson terms “spillovers.” Two key fundamentals driving contagion in the model are the size of government debt and the maturity period of the debt.

III. NON-CRISIS-BASED SHOCKS

The core of the non-crisis-based shocks is that cross-country shocks occur because of the trade and financial linkages among the countries of the world. This implies that the linkages are channels of international transmissions of business cycles. Globalization, particularly the economic dimension of it involving trade and financial flows, has increased the integration of countries and the possibility of transmission of shocks. The discussion of non-crisis-based shocks is done below by examining the trade and financial channels of the transmission of the shocks. Furthermore, the mechanisms through which oil shocks are transmitted internationally during tranquil periods are also discussed, because of the dominant role of oil shocks among non-crisis-based shocks. Oil is the most globalized commodity, hence direct oil shocks and even shocks to other commodities that trigger oil shocks as their second-round effects usually impact on the global economy significantly.

3.1. Transmission of Shocks through Trade Linkages

Shocks are largely transmitted via the trade channel, particularly into economies that rely heavily on trade. Kose and Riezman (2001) present a theoretical model of a small open economy that captures the major characteristics of an African economy, in order to analyse the relative effects of trade shocks in Africa. The indicated characteristics of an African economy include: (i) Heavy dependence on trade, particularly primary commodities as exports and intermediate inputs and capital goods as imports, which creates potential vulnerability to trade shocks. (ii) Heavy indebtedness and the necessity of debt service, leading to susceptibility to fluctuations in the world interest rate. The authors’ model is dynamic, stochastic, and multi-sectoral, where trade shocks are modelled as fluctuations in the prices of exports and imports, while financial shocks are variations in the global real interest rate. The empirical estimation of the model shows that trade shocks are the dominant source of macroeconomic fluctuations in African countries, compared to financial shocks such as world interest rate shocks.

The foregoing findings are consistent with that of Mendoza (1995) who observed through a small three-sector open economy model built through an intertemporal general equilibrium approach that terms-of-trade shocks account largely for GDP fluctuations in developing countries, which are mostly trade-driven economies. Terms-of-trade shocks are transmitted internationally in the model through international capital mobility, the cost of imported inputs, and the overall purchasing power of exports. As shown by the author, the constructed model is suitable to test certain regular empirical features of business cycles, one of which is the size, persistence, and procyclicality of terms-of-trade shocks.

3.2. Transmission of Shocks through Financial Linkages

The literature also shows various mechanisms through which shocks can be transmitted internationally via the financial channel. Karayalcin (1996) shows how a “real” shock can be transmitted via a financial channel. The author built a two-country model to explore the effects of a supply shock emanating from one of the countries and the transmission of the shock through the stock markets channel, assuming adjustment costs affect the investment decisions of concerned firms. As indicated by the author, a central feature of the model is that it deviates from the assumption in the related literature that capital can be moved costlessly between countries.

Shimokawa and Kyle (2003) show how shocks can be transmitted internationally via international bank lending. The author developed a portfolio selection model to explore the transmission of shocks through the financial linkages created by international bank lending. The authors note that a unique feature of the model is the nature of its banks’ profit function. The profit function has international and home parts. The model captures the correlation between the domestic conditions of banks’ home economies and their lending behaviour. The findings demonstrate the possibility of transmission of shocks from a lender country to debtor countries and the transmission of shocks between debtor countries through a creditor.

3.3. Oil-Related Shocks

Among all commodities, oil is the most globalized commodity. This makes oil to have a dominant role in cross-country transmission of shocks in tranquil periods. While oil shocks are transmitted via trade and financial linkages, the channels through the shocks impact on oil exporters and importers vary. The channels through which the shocks impact on oil exporters include rent seeking, Dutch disease, and the like; while the shocks impact on oil importers through their terms of trade, purchasing power, and the like.

3.3.1. Rent-Seeking

Rent-seeking models show how individual economic agents in a resource-rich economy such as an oil-exporting economy seek to acquire more wealth from the economy’s resources at the expense of the welfare of other agents. The work of Tornell and Lane (1999) seems to be outstanding in the rent-seeking literature. The authors’ model consists of a two-sector economy where powerful groups exist and interact, with the interaction modelled as an infinite-horizon dynamic game. The existence of weak legal and political institutions of the economy enables the powerful groups to seek a greater share of the resources of the economy following a windfall (e.g. a windfall following a rise in resource price), leading to a redistributive struggle between the groups that eventually leads to resources been used on non-taxable and unproductive activities that may hinder growth.

According to the authors, there is therefore a voracity effect in the above process, leading to an inefficient rise in redistribution which would not exist if the political and legal framework of the economy restricted the powerful groups and enhanced diffusion of power. One major implication of the behaviour of the rent-seeking powerful groups is that they may use their power to obtain economic policies that may hinder growth. For example, they may influence the optimal fiscal policy of the society, which may eventually cause rising inflation and a growth slowdown. Other studies of the rent-seeking theory are Wick and Bulte (2006); and Torvik (2002).

3.3.2. Dutch-Disease

These models explain the negative impact of a resource boom on an economy through a mechanism involving the booming sector making the products of the non-resource sector (understood to be the manufacturing sector in a developed economy and the agricultural sector in a developing economy) to be more expensive and less competitive in the world markets, the reallocation of factors of production from the non-resource sector to the booming sector, and the eventual decline of the non-resource sector, as a consequence of exchange rate appreciating in real terms.

Wijnbergen (1984) developed a model showing how oil can cause a decrease in aggregate income through the channel of learning by doing. When oil revenue increases in a country, the population seeks to use part of the increase for the consumption of non-traded goods, transferring resources from the traded sector to the non-traded sector. This consequently decreases learning by doing and production in the traded sector, leading to weaker aggregate income in the economy. More recent works on the Dutch disease theory are Sachs and Warner (1995); Matsen and Torvik (2005); and Torvik (2001).

3.4. Channels through which Oil Shocks Impact on Oil-Importing Countries

The literature shows that oil price spikes usually have negative impacts on oil importers. The mechanisms through which this occurs include the terms of trade at the macroeconomic level and the purchasing power of economic agents at the microeconomic level. The large oil price increases are wealth transfers from oil

importers to exporters, hence their effects are similar to that of a tax on the consumption of economic agents that eventually weakens their purchasing power.

The mechanism through which an oil price spike impacts on the economy of an oil-importing country touches on the demand-side and supply-side of the economy and has short-run and long-run dimensions. DePratto, Resende and Maie (2009) built a New Keynesian general equilibrium open economy model to explore the effects of oil price increases on an oil importing economy. In the model oil price variations are transmitted through different channels, which allow the fluctuations to have short-term and long-term effects on output both via the demand-side and supply-side of the economy, with the latter and former captured through the IS curve and the Phillips curve respectively. This makes it possible to compare short-term and long-term effects of oil shocks, as well as demand-side and supply-side effects. Other studies on the impact of oil shocks on the economy of an oil importer are Rotemberg and Woodford (1996); and Fin (2000).

IV. CONCLUSIONS

Internationally transmitted shocks are becoming more important in domestic economies, because of the increasing globalization of the world. This necessitates identifying the mechanisms through which the shocks impact on the economy. This paper examines the mechanisms of the international transmission of the two classes of shocks found in the literature, namely crisis-based and non-crisis-based shocks.

Important conclusions have been drawn from the discussions of the paper. First, contrary to the belief of many that agent behaviour is the only factor driving cross-border contagion, both agent behaviour and macroeconomic fundamentals are important factors of contagion. Second, international economic and financial interlinkages are the main channels of international transmission of shocks during tranquil periods. However, shocks are also transmitted internationally via economic and financial interlinkages during periods of crisis. This implies that crises affect interlinkages and interlinkages affect crises!

Third, oil price spikes could have negative effects on the economies of both oil importers and exporters via macroeconomic and even microeconomic channels. However, resource curse factors, such as Dutch disease, are the reasons for the paradoxical impact of oil price spikes in the economies of oil exporters.

Finally, despite the areas covered by existing literature on international shocks that are shown in this paper, there are still aspects that could benefit largely from future research. First, it would be useful to model the relative roles of agent behaviour and macroeconomic fundamentals in the transmission of both crisis-oriented and non-crisis-oriented shocks in one framework rather than examining these factors separately in crisis-based and non-crisis-based models, as done largely in existing literature. Apart from the fact that the single framework is more parsimonious than separate models, it will make examining the connections between the transmission mechanisms of the two types of shocks in one model to be possible.

Second, regarding the impact of oil price spikes, it would be useful to have models showing how international cooperation can solve the resource curse problem by dealing with the causative channels of the curse such as Dutch disease. That is, it would be useful to model how international policy cooperation can complement the domestic policies designed to solve the resource curse problem in resource-rich economies experiencing the challenge, as existing models focus on the roles of domestic macroeconomic conditions and policies in the challenge.

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