

The Asian Crisis and the Process of Financial Contagion

Franklin Allen* and Douglas Gale**

*Wharton School, University of Pennsylvania, Philadelphia, PA 19104 USA

**Department of Economics, New York University, New York, NY 10003 USA

Franklin Allen is Nippon Life Professor of Finance and Economics at the Wharton School; Douglas Gale is Professor of Economics at New York University. Their joint research has appeared in books and numerous articles in leading journals and has included major contributions to the theory of security design, risk sharing, comparative financial systems and, most recently, banking and financial crises.

Abstract

Economists have believed for a long time that financial systems are fragile in the sense that small shocks can cause serious disruption. Research has focused on phenomena, such as bank runs, which affect the stability of individual institutions. Only recently has there been interest in the phenomenon of contagion, in which financial distress in one institution or one sector of the financial system spreads to other institutions or sectors. The crises in Southeast Asia in 1997 and Russia in 1998 have provoked speculation that financial crises have spread from one country to another. This article reviews a number of possible hypotheses about the process of financial contagion and relates them to recent events in emerging markets.

Introduction

In 1997, after years of steady growth, some of the world's most successful economies in Southeast Asia suffered severe financial crises in which their stock markets and currencies

plummeted. These events were followed by recessions in which gross domestic product fell significantly. Was the timing of these events fortuitous? Were these events caused by some common external shock? Or did the crisis spread by contagion from one country to the others? There is no doubt that some of the countries involved had serious economic problems before the onset of the Asian crisis. For example, Indonesia, Malaysia and Thailand are said to have been plagued by nepotism, corruption and ineffective banking regulation. South Korea had a rigid industrial structure dominated by the chaebols and the government's industrial policy had encouraged banks to make loans that were not commercially sound. However, all of these factors were in place during many years when these economies were successful. They may have set the stage for the crisis that occurred in 1997, but they did not necessarily precipitate it.

In 1998 Russia announced a restructuring of its debt which in effect amounted to a partial default. This event triggered extreme capital market turbulence and led to significant problems in Brazil and the Asian countries that had suffered crises in 1997.

There is no consensus about the causes of the Asian crisis or the channels through which it spread. However, the possibility that contagion played a role has been the subject of much discussion. The way in which the Russian crisis of 1998 spread has also received considerable attention.

Three channels of contagion have been suggested. The first is *real contagion*, which results from competition in international trade. When one country devalues its currency, other countries that compete in the same markets may also be forced to devalue. As a result, a crisis in one country can spread to other countries¹. An example of this kind of contagion occurred during the Great Depression of the 1930s and was characterized by

“beggar-my-neighbor” policies. The mechanism for this kind of contagion is relatively well understood. In this note we focus on two other channels of contagion, *financial* and *informational contagion*, which are less well understood.

Financial Fragility

From the earliest times, banks have been plagued by the problem of bank runs, in which many or all of the bank's depositors attempt to withdraw their funds simultaneously. Because banks issue liquid liabilities in the form of deposit contracts, but invest in illiquid assets in the form of loans, they are vulnerable to runs that can lead to closure and liquidation.

There are two main views of bank runs. One is that they are random events, unrelated to changes in the real economy. In its classical form, this view argues that runs are the result of mob psychology or mass hysteria². The modern version of this view³ is that bank runs are the result of self-fulfilling prophecies. Given the assumptions of “first-come, first-served” and costly liquidation of assets, there are two possible scenarios. If everyone believes that a bank run is about to occur, it is optimal for each individual to try to withdraw his funds. Since each bank has insufficient liquid assets to meet all of its commitments, it will have to liquidate some of its assets at a loss. Given the “first-come, first-served” rule, those depositors who withdraw first will receive more than those who wait. So, anticipating this sequence of events, all depositors have an incentive to withdraw immediately.

The alternative scenario does not entail a run. If no one believes a bank run is about to occur, only those with immediate needs for liquidity will withdraw their funds.

Assuming that banks have sufficient liquid assets to meet these legitimate demands, there will be no incentive for other depositors to join a run on the bank.

Which scenario occurs in practice may depend on extraneous variables which economists have named “sunspots”, after erroneous nineteenth century theories that linked the business cycle to solar activity. Although sunspots have no effect on the real data of the economy, they can affect depositors’ beliefs in ways that turn out to be self-fulfilling.

The alternative to the sunspot view is that banking panics are an integral part of the business cycle. An economic downturn reduces the value of bank assets, raising the possibility that banks will be unable to meet their commitments.

“When prosperity merges into crisis ... heavy failures are likely to occur, and no one can tell what enterprises will be crippled by them. The one certainty is that the banks holding the paper of bankrupt firms will suffer delay and perhaps a serious loss on collection.”⁴

If depositors receive information about an impending downturn in the cycle, they will anticipate financial difficulties in the banking sector and try to withdraw their funds. This attempt will precipitate a crisis. In other words, banks runs are not random events but a response to the unfolding circumstances of the business cycle.

Using historical data on nineteenth and early twentieth century financial crises in the U.S., economists have tried to differentiate between the sunspot view and the business-cycle view of banking panics.⁵ The evidence is consistent with the view that banking crises are related to the business cycle and, while it is impossible to rule out the possibility that these crises were random events, unrelated to real developments in the business cycle, that interpretation seems strained.

These empirical observations have motivated recent theoretical work aimed at developing a model of financial crises as part of the business cycle.⁶ This model has been used to formulate an optimal policy for monetary authorities and regulators. The main conclusion of this analysis is that an optimal policy should not be aimed at preventing bank runs per se. The economic costs of financial crises arise from the premature and costly liquidation of assets. These costs can be avoided if the monetary authorities provide sufficient liquidity to the banks in the form of reserves and borrowing facilities.

Financial Contagion

Until recently, the theory of financial crises focused almost exclusively on the instability of individual institutions. To explain a systemic banking crisis one was forced to assume that all banks are simultaneously affected by the same exogenous shock. This is easily done in models where bank runs are interpreted as sunspot phenomena. If a single bank run can occur as the result of a self-fulfilling prophecy, the simultaneous occurrence of runs on several banks is easily explained as the result of self-fulfilling beliefs on the part of depositors that a run on each of those institutions is about to occur. In the same way, simultaneous financial crises can occur in different countries if international speculators happen to believe that the currencies and stock markets are going to be the subject of simultaneous speculative attacks.

Contagion, according to this theory, occurs because a financial crisis in one country acts as the sunspot that triggers self-fulfilling expectations of a crisis in another country. Even though there is no substantial economic link between events in the two countries, the self-fulfilling nature of these events lends them a compelling rationality.

Numerous commentators and politicians have argued that the crisis in Southeast Asia had this character and that healthy economies suffered as the result of unprovoked speculative attacks. While there is no doubt that this kind of scenario is theoretically possible, it ignores the very real problems that existed in many of the countries affected by the events of 1997 and the alternative explanations offered by economists.

A different model of financial contagion extends the notion of financial fragility by showing how a shock to one small part of the banking system can destabilize a much larger system⁷. The basic ingredients are found in the bank runs model, which is now extended to encompass a system of multiple sectors, regions, or countries. The financial institutions within a given region are subject to similar shocks in the form of unanticipated demands for liquidity or unanticipated changes in the values of bank assets such as loans and securities. To provide a hedge against the risk of unanticipated shocks, financial institutions hold claims against institutions in other regions. For example, to meet an unanticipated need for liquidity, a bank can draw down its claims on other financial institutions. In normal times, these claims allow the financial institutions in different regions to even out fluctuations in liquidity needs and asset returns. If region A has an excess supply of liquidity and region B has a deficit, region B can obtain liquidity by drawing down some of its claims on banks in region A. However, when there is a global shortage of liquidity, the existence of these claims turn out to be less benign. The stock of liquid assets in the financial system is fixed at a point in time. The only way for the financial system as a whole to increase the supply of liquidity in the short run is to liquidate some of the less liquid, longer-term assets. It can do this either by selling assets, perhaps at greatly reduced prices, or through the premature termination of investment

projects. Naturally, institutions that do not have to liquidate such assets will refrain from doing so. However, institutions that are short of liquidity are forced to liquidate illiquid assets and suffer the associated loss of asset value. If the loss is large enough, it may provoke a bank run, which in turn will force an even greater liquidation of assets and a greater loss of value.

This is only the first step in the process of contagion. What allows the process to spread is the interconnectedness of the financial systems of different regions. Suppose that banks have failed in region A and that banks in region B hold claims on banks in region A. There is now a “spillover effect”, because a loss of value in bank assets in region A reduces the value of claims held by the banks in region B. If the spillover effect is large enough, it may cause insolvency of banks in region B, which will provoke runs on those banks and force the banks in region B to liquidate illiquid assets at a loss. Now that two regions have been affected by the panic, the loss of value in bank assets—and hence the strength of the contagion—has grown. If banks in region C have claims on banks in region B, their losses will be compounded by the losses in regions A and B. Like a snowball rolling down a mountain, the contagion gathers force as it affects another region and then another.

A crucial element of this process of contagion is the fact that no institution wants to bear the cost of providing liquidity to other institutions. When region A is first affected by a shortage of liquidity, it might be possible to prevent the crisis from spreading at very little cost if the banks in other regions were to provide a small amount of liquidity to troubled banks in the first region. If they were to do so, they would save themselves the much greater losses that they will suffer if the crisis spreads. However, self-interested

institutions will not have an incentive to provide liquidity. The prevention of contagion is in the nature of a public good, whose benefits are shared by all institutions but whose costs are born by the individual institutions that provide liquidity. It is rational for each institution to be a “free rider”, hoping that other institutions will bear the cost of providing the public good. In the end, the public good (liquidity) is not provided, the contagion spreads, and the cost to banks in other regions is much greater than would have been required to stop the contagion in the first place.

One of the important factors in determining whether contagion occurs is the density of the financial links between different regions. If the network of financial claims among regions has many connections, then the spillover effect from the initially troubled region is diffused across a large number of regions. This might happen if claims on region A are equally held by regions B, C, D, and so on. The impact on any one region may, as a result, be relatively small, too small to provoke a crisis in the other regions. On the other hand, if the network of financial connections has a few significant connections, so that the spillover from the initially troubled region is concentrated on one or two adjoining regions, then the same spillover effect may be sufficient to provoke a crisis in first one region and then another and then another. This would be the case if all claims on region A are held in region B, all claims on region B are held in region C and so on. The entire spillover effect from region A is felt in region B, the combined spillover effect from regions A and B is felt in region C, and so on. There is nothing to stop the contagion spreading one by one from the first region to all the rest.

An illustration of this kind of contagion was the effect on Japanese banks of non-performing loans made to other countries in Southeast Asia⁸. Although the Japanese

system did not suffer a complete collapse, the problem of bad loans added to the domestic problems of the banking sector that had been accumulating since the beginning of the decade, when the asset price bubble of the nineteen-eighties collapsed. The Japanese economy already suffered from what economists describe as a debt overhang, meaning that banks have such weak balance sheets that they cannot conduct normal business, with the result that commercial and industrial companies are starved of funds. The effect of the collapse of several Southeast Asian economies was to worsen the debt overhang substantially.

Another illustration is provided by Korea during the crisis of 1997. In an attempt to diversify and at the same time cover the high cost of funds, Korean financial institutions systematically sought out high-yield, high-risk investments. For example, during 1996 they purchased 40% of Russia's first Eurobond issue, 20% of large Mexican and Brazilian issues and all of a Colombian issue. When Korean banks began to suffer liquidity problems in 1997 they began to sell off Russian and Brazilian assets. This caused a fall in prices which led to further follow-on sales by Brazilian investors⁹.

These are examples of direct spillovers from debtor countries to creditor countries. Spillovers can occur without the presence of any direct claims, as long as two countries are linked by their dependence on a third party. Brazil was forced to devalue in late 1998 following the Russian debt restructuring earlier in the year. There was no direct connection between the Russian economy and the Brazilian economy. Internal risk management systems at the proprietary trading desks of large investment and commercial banks require that if volatility increases, positions should be reduced or more capital must be committed. When volatility went up after the Russian debt restructuring, these

institutions decided to reduce their exposure to emerging markets and there was a large sell-off of both Russian and Brazilian assets¹⁰.

Another example of contagion via third parties, this time in the Asian context, may be provided by the pivotal role of the Japanese in providing finance for the emerging economies of the region. Losses in one country would make it harder for the Japanese to provide finance to a second country, thus indirectly creating a spillover effect between the two client countries.

Similarly, when several countries are dependent on the same international organization, such as the IMF, for relief from a speculative currency attack, the fact that several countries have already required substantial amounts of support may limit the ability of the organization to assist another country, thus making it more vulnerable to a speculative attack.

Informational Contagion

The mechanisms described above depend on the property that a default in one region causes a direct financial loss to another region. Another type of mechanism depends on the fact that a financial crisis in one country provides a signal that reveals some underlying problem in another country. For example, if the state of two economies is believed to be correlated, then a crisis in one country, which reveals some underlying weakness in the economy of that country, may be interpreted as a signal that the economy of another country also has the same underlying weakness. A familiar example of this is the so-called “Tequila effect”. After the banking and currency crisis in Mexico in 1994, other South American economies came under attack. It is not clear that there is any causal connection

between the Mexican economy and, say, the Argentine economy. The explanation for the Tequila effect is simply that when investors have imperfect information about the true, underlying causes of a crisis in a country like Mexico, they may hypothesize that “all South American economies are alike” and draw the conclusion that if Mexico is in trouble today, Argentina will be in trouble tomorrow. This has been referred to as the “wake-up call” phenomenon¹¹

The danger in this kind of reasoning is that, at best, it is based on a loose correlation between the state of economies that may be quite different. Even assuming that there is some rational basis for the initial hypothesis, the correlation between the state of two economies will not be perfect, so there is a positive probability that a speculative attack on the currency or a run on the banks will occur when there is no underlying problem.

This phenomenon may have affected the countries in Southeast Asia. The first country to be affected was Thailand. Because it had pegged its currency to the US dollar, the international prices of Thai goods were swept upwards with the dollar, reducing demand for exports and increasing demand for imports. The deterioration in the balance of trade was the proximate cause of a speculative attack on the Thai currency. The devaluation of the baht increased the debt burden of Thai companies which had borrowed dollars, and the prospect of defaults increased the flight of capital out of Thailand.

The next country to be affected was Indonesia. Both Indonesia and Thailand had problems with corruption and weak regulation. A crisis in Thailand may have been taken as a signal of problems in Indonesia, which then provoked capital flight and a speculative attack on the currency. Against this, it could be argued that the two economies were

sufficiently different and the direct trading and lending connections between them were sufficiently weak that investors and speculators had no reason to think that a crisis in one country would lead to a crisis in the other. In any case, the problems in both countries were known for some time.

A subtle variant of the informational contagion hypothesis may explain the linkage between the crises in Thailand and Indonesia. Suppose that many investors are aware of problems in the Indonesian economy but that they do not know how many other investors are aware of the same problems. As long as the information is not generally available, it may be safe to continue to invest in Indonesia, in the belief that it will always be possible to sell out one's investments at a good price before the inevitable crash occurs. What a crisis in a neighboring country does is to provide a "wake-up call" to all investors in the Indonesian economy, prompting them to check on their investments and, more importantly, to realize that other investors will be doing the same. Even if the number of investors who know of the problems in the Indonesian economy remains constant, it is now common knowledge among these investors that problems exist and this may be enough to provoke a crisis.

When the Russians surprised the international community by defaulting on their debt in 1998, there was immediate speculation that other countries might suffer a financial crisis. Argentina was mentioned as a possible candidate for a currency attack or capital flight, although there was no obvious connection between the two economies. One possible explanation lies in the fact that the Russian default had changed the international community's expectations about the ability and determination of the IMF to prevent such crises. If the Russians could be allowed to default, it was argued, would the Argentines be

far behind? Here the information revealed by the Russian default concerned the IMF rather than the target country, Argentina, but the effect is the same, an increase in the vulnerability of Argentina to speculative attack.

Conclusion

There are many possible channels by which a crisis in one country or region may spread to other countries or regions. The severity and scope of the contagion depend on the particular type of contagion involved. So will the policy tools available for containing the contagion. Our theoretical and empirical understanding of contagion is limited and there is no consensus about the role that contagion has played in the recent financial crises that occurred around the world. It is to be hoped that our current research will allow us to prevent future crises so that we do not have to learn from painful experience.

References

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⁸ See *International Capital Markets: Developments, Prospects, and Key Policy Issues*, Washington, D.C.: International Monetary Fund, September 1998, p. 116.

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