Was The "Tequila Effect" Rational?

Richard Doyle, Dominic Scott and Carmel Crimmins- Senior Sophister

Financial contagion is the phenomenon where flows of capital to one economy result in increased likelihood of similar flows to another country. There are both rational and irrational causes of this contagion and it is this very point that is addressed by Carmel Crimmins, Richard Doyle and Dominic Scott. By investigating the causes of the Mexican devaluation of 1994 and the subsequent consequences on the world's emerging markets, they conclude that the 'Tequila Effect' was rational.

Introduction

The aim of this paper is to establish whether contagion in international capital markets is a rational or irrational phenomenon. Contagion is identifiable whenever large amounts of capital flows, either to or from one country, increase the likelihood of similar flows in other countries. Contagion can be thus positive (capital inflows) or negative (capital outflows). In this paper we concentrate on negative contagion. We focus our analysis on the Mexican Peso crisis of December 1994 and the negative reverberations this event unleashed upon emerging markets worldwide. We consider the rationality of this so-called 'Tequila Effect'.

First, we familiarise ourselves with the various explanations for contagion between countries, both rational and irrational. Secondly, the events leading up to and including the Mexican crisis are examined. Thirdly, we take a cross section of countries, subjected to varying speculative pressures as a result of the 1994-95 crisis, and analyse the factors that caused such pressures. Using this data we establish how rational the markets were in discriminating between these countries.

On the basis of our findings we conclude that "the first financial crisis of the 21st Century" was caused by macroeconomic similarity and the demonstration effect. However, the magnitude of the capital outflows does suggest an element of irrational self-fulfilling panic among investors. Although no two financial crises are the same and much research remains to be done, it would appear that investors, while not immune to irrational action on the whole, only withdraw their capital when they have good domestic economy reasons for doing so.

Section 1: What Causes Contagion?

This section will discuss the various theories that have been put forward, either in isolation or in conjunction with one another, to explain contagion in the international capital market. They seek to explain how a crisis in one country can cause a crisis in another country; that is, the channel(s) by which contagion spreads. The analysis will assume that there are two countries, A and B, both of which suffer destabilising crises in that order. This overview will be the basis upon which we evaluate the 'Tequila Effect' and, in particular, whether it was rational or irrational.

'Rational' Explanations

Trade

Strong trade links are one possible explanation of contagion. If A suffers a devaluation of its currency, then B will experience a fall in its international competitiveness. This is because its exports become more expensive relative to A's exports. Thus there is an increased incentive for B to devalue its currency in order to regain its competitiveness.

Furthermore, because individuals in B demand more imports from A, they require more foreign currency to satisfy this demand. This pressure on the international reserves of B's Central Bank causes a greater expectation of devaluation as the central bank has less insulation against an attack.

Another trade channel is that of commodity prices. When A experiences a crisis, it demands less imports. This causes the prices of commodities to fall, which then negatively impacts on countries, such as B, that are heavily reliant on the export of raw materials.

Macroeconomic Similarity and the Demonstration Effect

Similarity in macroeconomic (including political) conditions and economic policies may also explain contagion. Suppose there is a devaluation in A. Investors become suspicious of countries that are similar in macroeconomic terms, such as B, because they may believe that there is causation running from a certain set of macroeconomic conditions and/or policies to currency devaluation. Their expectations are accordingly altered with the ultimate result being devaluation in B.

The "demonstration effect" is related to this theory. The effect is that the crisis in A demonstrates to investors that there could be cause for concern about countries of a similar macroeconomic nature. Once the crisis strikes in A, investors scrutinise B more closely and may find that everything is not to their satisfaction, contrary to their previous belief. This demonstration effect would certainly help to explain why crises tend to arrive in groups. A variant of this argument is the model of Calvin and Leahy (1995). They claim that even though difficulties are suspected in B, investors wait because it is costly for them to take a position in advance of a crisis. Therefore when a crisis erupts in A it has the effect of confirming the suspicions of investors in B, resulting in a devaluation in B.

The attitude to risk of those investing in B may be influenced by a crisis in A. If they become more risk averse, having being 'stung' by the crisis in A, they may withdraw capital in other similarly risky countries. This point is similar to that of macroeconomic similarity, except that this case requires a change in investors' risk preferences for the crisis to spread to B.

'Good Practice'

The importance of maintaining liquidity, known as 'good practice', might also explain contagion. If investors experience losses due to a currency crisis in A, they may need to sell assets in B simply to maintain a sufficiently liquid portfolio of assets. The outflow of capital from B could then trigger a devaluation of its currency. Furthermore, the fact that A has devalued reduces the political cost of B devaluing its currency.

'Irrational' Explanations

Alternatively, economic agents may be prone to irrational behaviour at the time of crises. There may be a characteristic, inherent in economic agents, which engenders behaviour that simply does not make sense.

Asymmetric Incentives

A more specific explanation focuses on the asymmetric incentives that agents dealing in the financial market face. For example, fund managers potentially have a huge amount to lose by holding assets in a region (A and B) in which A has experienced a currency crisis in contrast to withdrawing funds from the region and investing elsewhere (C). Ultimately, they will lose by such a withdrawal but this loss is dwarfed by the potentially catastrophic loss that would result if B suffered a crisis.

Non-Macroeconomic Similarity

Similarity of some non-macroeconomic or political characteristic is advanced as an explanation of contagion. Though the economies of A and B may not be explicitly linked in an economic or political sense, they may be linked by a common temperament. Thus, when one thinks of the 'Latin temperament' (where A and B are Latin countries), one may have images of flair, flamboyance and a particular reputation. This may be perceived as a sufficient reason for investors to disinvest in B because of a currency crisis in A. A related case is that of the currency of a set of countries. If the name of the currencies of A and B is the same, then investors may associate A and B (and their fortunes) together. Thus whenever A experiences a crisis, B would be expected to follow suit.

Information Cascade

Shiller (1995) provides an alternative explanation. It is based upon the idea of information cascade. Agents' decisions are shaped by their local conditions. Once one agent reacts on the basis of information in their locality, say A, other investors may incorrectly interpret this as a signal with global implications. This signal can then trigger a crisis in B as the information cascades from one agent to another, giving the impression that there is global agreement on the issue.

Section 2: The Mexican Crisis

Background

In 1987, Mexico undertook a comprehensive process of "macroeconomic stabilisation and structural transformation". This included the tightening of fiscal policies, the use of the exchange rate as a nominal anchor, trade and exchange liberalisation, privatisation and the restructuring of external debt. In spite of all this, Mexico suffered a currency crisis in late 1994, a crisis that resulted in a 7% contraction of real GDP in 1995. Why did this happen?



Ignoring the Signals

Krugman argues that the Mexican crisis is an example of a speculative bubble bursting, and his theory fits well with the facts. He cites, among other factors, the fall of communism, the adoption of 'free market religion' by the emerging economies and the world-wide fall in interest rates in the early 1990s as causes of excessive investor optimism in emerging markets. One result was the massive rise in capital inflows to Mexico (see Figure 1).

The speed and scale of the rise in total foreign investment in relatively untested waters signified substantial investor optimism regarding the economic reforms, and a lack of vigilance regarding Mexico's economic performance. Although economic growth was strong, as shown in Figure 2, it did not match the spectacular rise in foreign investment. The economy grew at an average real rate of 3.1% in 1989-1994,

and experienced negative growth in the second half of 1993 (Figure 2 shows smoothed annual growth, explaining the positive growth rate illustrated for 1993).

Figure 2: Mexican GDP Growth 1989-1997



Although inflation fell from around 25% in the 1988-1991 period to 7% in 1994, the fall was not quick enough or large enough to stop a massive real exchange rate appreciation. Exacerbated by this loss of competitiveness, a pre-election spending spree and deterioration in private sector savings, the external current account deficit grew steadily from 1.4% of GDP in 1988 to 8% in 1994. Investors' lack of regard for these indicators was compounded by the government's failure to publish data on foreign exchange reserves, which plummeted from \$25bn in 1993 to \$6.5bn in 1994.

Panic

In 1994, prompted by a substantial rise in world interest rates, a peasant revolt, an earthquake and two political assassinations, the markets became increasingly uneasy about Mexico. Foreign capital fled. Interest rates rose to 16% in July, but this added fuel to fears of a recession-avoiding devaluation.

In December 1994, the peso was devalued by 15%. This is considered a "botched devaluation" because the Mexican authorities lost all credibility but did not satisfy the market, as the devaluation was too small. The result was a near-complete loss of confidence, the peso free-falling to half its pre-crisis value, inflation averaging 52%, interest rates peaking at 80% and a 7% contraction of real GDP in 1995.

Rescue

In January 1995, the USA orchestrated a \$50bn international loan which, in conjunction with a stringent adjustment program and rapid export growth in 1996 (a rise of 20% from 1995), restored confidence and growth by 1996. The rescue plan raised fears of moral hazard, but was justified by Mexico's "good track record" and desire to avoid risk of systematic repercussions: "Mexico's crisis could raise doubts [*unwarranted by fundamentals*] about the viability of policies in other countries as well", according to Mr Camdessus. This paper aims to discover if the Tequila effect was a form of rational or irrational contagion, and hopefully can shed some light as to whether Mr Camdessus's fears outlined above were warranted.

Section 3: The Tequila Effect

In this section we investigate why some emerging markets were hit by financial crises in the wake of the Peso devaluation while others were not. We analyse the discriminating factors and test their rationality. We conclude that the Tequila Effect was transmitted by a rational demonstration effect based on shared macroeconomic fundamentals. Although the demonstration effect was largely rational in its discrimination between "weak" and "strong" countries, it did, however, contain an element of irrationality; nervous investors often withdrew their funds in the expectation that other investors would do likewise. "Therefore, the *possibility* of panic, which has existed before December 1994, became the *fact* of a panic after

Argentina

Between December 1994 and March 1995, Argentina suffered badly from the Tequila Effect. Bank liquidity tightened, interest rates surged and 15% of deposits were withdrawn from the banking system. International reserves decreased substantially, while the stock market fell by 35%. The authorities reacted by obtaining international aid and establishing lender of last resort facilities, which eventually led to a restoration of confidence and an economic recovery.

Reform

Like Mexico, Argentina had been implementing pro-market reforms prior to the crisis. In March 1991, Argentina adopted the Convertibility Plan, under which it made considerable progress in stabilisation and structural reform. The peso was pegged to the dollar by a currency board, indexation was eliminated and domestic credit was limited by the Central Bank. Structural reform was undertaken by the deregulation, privatisation and liberalisation of the economy. Argentina enjoyed a strong macroeconomic performance from 1991 to 1994. Real growth averaged 7.7%, inflation was massively reduced, the fiscal situation was stable and the current account deficit remained below 4%. Table 1 shows this:

Table 1: Selected Economic Indicators for Argentina 1991-95							
	1991	1992	1993	1994*	1995**		
Real Growth	8.9	8.7	6.0	7.1	2.0\3.0		
Consumer Prices	84.0	17.5	7.4	3.9	3.6		
External Current Account Balance	-0.2	-2.8	-2.9	-3.7	-2.0		
Overall Balance of Non-financial Public Sector	-0.8	0.7	2.1	0.1	1.5		
Gross Official Reserves	8.6	8.6	9.7	9.3	9.1		
Source: IMF - * Preliminary * *Program Former two: % change Latter three: % GDP							

Superficially, it seems that the situation in Argentina did not warrant a crisis. Its strong macroeconomic performance before the Mexican devaluation was underpinned by extensive reforms to which the government appeared committed. The fact that Argentina has made a good recovery from the crisis also suggests that the crisis was unwarranted. What then was the problem?

On Closer Examination

Argentina and Mexico are not important trading partners, so the trade channel is inapplicable here. Equally, the exercise of 'good practice' is difficult to gauge. The demonstration effect, however, seems to be pertinent. We claim that after the Mexican crisis investors scrutinised Argentina and on closer examination discovered cause for concern.

The Demonstration Effect

Argentina's current account, despite being below 4% GDP over 1991-94, had (like Mexico's) been widening and had actually increased by 0.8% GDP in 1994. In addition, the fiscal situation had deteriorated due to expenditure overruns and a reduction in employer social security. Indeed, the need to maintain a healthy fiscal surplus was emphasised in the IMF rescue plan.

In addition, though Argentina's reform was impressive, the fact remained that it was incomplete when the Tequila Effect struck. Thus, even if the Argentinean government was genuinely committed to reform, there was still the possibility that it might renege on its reforms. Indeed, the enhancement of labour market flexibility was pinpointed by the IMF as being crucial to improving Argentina's international competitiveness after the Tequila Crisis. The crucial point is that *investors*' information may have given them reason to worry about Argentina.

Furthermore, as in Mexico, there were tensions in the Argentine banking system. Latin America has a long history of banking crises and Argentina had problems in the early eighties. Though it had since begun reform, the rapidity of its economic growth and the magnitude of capital inflows meant that there were many opportunities to make soft loans. The bank reform undertaken after the crisis implied that some banks were too small while others were still state-owned, thus bank reform had not kept pace with the liberalisation of capital flows. The fact that Argentina signed up for the Special Data Dissemination Standard could be evidence that there was inadequate transparency before the Tequila Crisis.

This 'closer examination' suggests that investors were rational in their concern about Argentina. Therefore, their withdrawal of funds from Argentina and the Tequila Effect was rational.

The Philippines

The Philippines was the Asian country most deeply affected by the Tequila Effect. The duration of speculative pressure on the peso was longer and the drop in stock prices greater – by April 1995, the stock indexed measured in dollars stood 16.7% its previous November level - than for any other country in Asia. Was the capital flight by small investors of US\$1 billion in the first quarter and the US\$500 million outflow of residents' portfolio investment justified on rational grounds?

Channels of Transmission

Similarity in macroeconomic fundamentals appears to be the most important rational factor in the Philippines' intoxication with the "Tequila Effect". Although Eichengreen et al found that trade links rather than macroeconomic similarities are the dominant channel for contagion this explanation is not adequate in the case of Mexico and the Philippines. Neither the level of trade between the two countries nor the degree of export competition between them is large enough. The 'good practice' argument, while plausible, is difficult to gauge.

Macroeconomic Climate

The Philippines had long been regarded as an economic pariah. Throughout the 1980s GNP increased by only 1.5% per annum, a pittance when compared to the double-digit growth rates of the neighbouring Southeast Asian tigers.

Table 2: Selected Economic Indicators (1990-94)	Philippines	Mexico			
Real Exchange rate % Change	-6.7%	-28.55			
Average (90-94)/(86-89)					
Current Account Average (% GDP)	-5.9%	-3.5%			
Rate of Growth (%GDP)	2.5%	3.0%			
Inflation	11.7%	16.95%			
Fiscal Deficit	-2.3%	-1.16%			
Source: Sachs et al (May 1996).					

In the early 1990s financial restructuring and reform began in earnest. These measures together with the Philippines' geographic location in Southeast Asia provoked a positive response from international capital markets. In 1993 the Philippines' stock market was the Far East's best performer with gains for the full year reaching 134%. As was the case for Mexico, however, the stock market gains were only marginally related to the performance of the domestic economy (see Table 2).

"Growth," said Mahathir Mohammad, the Malaysian Prime Minister, "is a wonderful buffer. Like a river in flood, it obscures the rocks below".

Mahathir may have been right about the camouflaging effect of Malaysian economic growth (8.7% as a percentage of GDP for 1989-94) but really the Philippines growth rate was more of a trickle than a river. Between 1989 and 1994 the economy grew an average of 2.5% per annum, just enough to keep per capita income steady given the equivalent yearly population growth rate of 2.5%. Indeed, in 1991 the Philippines experienced negative growth of 0.5%.

If high growth rates were not responsible for the large investment flows then what was? Perhaps investors were interested in the potential, as opposed to the actual, performance of the economy. This is rather unlikely given the short-term nature of most incoming investments. In addition, private and public provisions for future economic growth were not particularly worthy. The Philippines has a low rate of saving; meaning that most of the deficit on the current account (average of 4% for the period 1989-94) was financed using foreign capital. A large current account deficit financed from overseas is not necessarily pernicious provided borrowed funds are used for profitable ventures. Unfortunately, a large amount of public revenue was spent on public sector wages and the servicing of domestic and foreign debt, with little left over for capital spending.

The most likely explanation for the large capital flows into the Philippines is irrational positive contagion. The demonstration effect unleashed by the Mexican crisis thus provoked a rational outflow of funds.

Chile

In the series of financial crises in Latin America in 1982, Chile was one of the worst affected: output fell by 14% and unemployment rose to 20%. Yet in 1995, Chile was

largely unaffected by the Tequila Effect. Economic growth in 1995 was robust (real growth was 8.2%), and the nominal exchange rate actually appreciated by 10% in the first quarter of 1995, reflecting investors' sense of safety in the Chilean peso. Why did Chile fare so much better in 1995, especially when compared to Mexico and Argentina?

Different macroeconomic policies are cited as the main cause: Chile was one of the leading Latin American reformers after the 1982 crisis. The Chilean peso was floated within a sizeable band, of which the central rate was pegged to a basket of the yen, deutschmark and dollar. The central bank was made independent, with the aim of promoting export growth as well as reducing inflation. Consistent with the policy of export promotion, a series of devaluations in the 1980s helped maintain competitiveness (the peso fell 30% in real terms over 1982-1986).

Fiscal policy was tight, averaging a surplus of 1.7% of GDP in 1989-1994. This, in conjunction with radical reform of the pension system helped to raise domestic savings, which rose to 25% of GDP in 1995 (compared to Argentina's 15%). This enabled substantial investment to be financed by domestic money, and helped quash fears of 'over-reliance' on inflows. Some capital controls were imposed to keep the real exchange rate stable: foreign investors were obliged to keep their cash in the country for at least a year, and restrictions on foreign bond issues launched by Chilean companies were imposed. The result was large inflows of foreign investment of a long-term nature, thus dramatically reducing reliance on jittery short-term portfolio investment.

Chile maintained investor confidence in 1995 by pursuing economic policies consistent with a correctly valued real exchange rate, while the capital curfews arguably helped to avoid short-term investor panic from materialising into massive outflows. Chile's weak trade links with Mexico discounts this channel for rational contagion. The lack of macroeconomic similarities, as discussed above, discounts the other main rational channel. This suggests that the Tequila Effect was rational in avoiding Chile, adding more weight to our findings that the contagion was largely rational.

Colombia

Like Chile, Columbia was a Latin American nation little affected by Tequila. The Colombian stock market rose in January and February 1995 and then remained flat for the remainder of the first semester. Reserve levels actually rose in the first quarter.

Columbia has a strong and prudent tradition of macroeconomic management dating back to 1990. Liberalisation of trade, fiscal policy and foreign investment yielded increases in private investment inflows, albeit without the sharp fluctuations characteristic of other Latin American capital markets.

When the Tequila Effect kicked in, Columbia had little reason to be affected. The country did not have strong trading links to Mexico, and unlike the latter, its reputation with capital markets was unblemished. With the exception of high inflation (23.8% in 1994), Columbia's macroeconomic fundamentals were glowing. Moderate exchange rate appreciation, steady economic growth (4.1% of GDP for the period 1989-94), a sound banking system and oil reserves (discovered in 1993) all served to reassure anxious investors. With the reasons for investment still apparent there was no rational reason to reverse the flow.

Thailand

In early 1995, the Thai baht was attacked, despite Thailand's strong reserve position and high economic growth rate. The speculative attack was not sustained as the authorities intervened to ensure that the fixed exchange rate was maintained with reserve losses being restricted to only \$374 million. However we now know there *were* serious deficiencies in the Thai economy, particularly in the banking sector. One could conclude that the probing of investors was rational and that the pressure should have been sustained. An alternative conclusion is that a successful speculative attack was not the efficient outcome at the time, but was efficient in 1997. Thus the lack of contagion in 1995 may well have been rational.

Conclusion

The Managing Director of the IMF, Michael Camdessus, feared that the crisis in Mexico would provoke irrational contagion. Our analysis illustrates his fears were unfounded. The markets discriminated rationally across emerging markets. Countries with plentiful foreign exchange reserves and solid fundamentals did not suffer long downturns in capital inflows. In contrast, countries with weak fundamentals and low reserves endured prolonged capital withdrawals. The timing and magnitude of the capital outflows does suggest an element of self-fulfilling pessimism. Although their sense of panic may have been irrational, their targets were not, as none of the countries infected were innocent bystanders. All those affected by negative outflows of capital had previously enjoyed capital inflows over and above what their fundamentals warranted. Irrational positive contagion was countered with rational negative contagion.

According to Michael Bordo, an economic historian at Rutgers University, in every financial crisis he had ever studied, going back over centuries, when investors withdrew their capital they had had good domestic economy reasons for doing so. Although the Tequila Effect is just one example of a contagious financial crisis, its operation illustrates the rationality inherent in these outbreaks of contagion. Like any efficient market, the capital market will adjust to ensure equilibrium; if the capital flows to a particular country are excessive, the market will reduce or reverse the flow. Drinking Tequila on an empty stomach leads to dire results, so ingesting large amounts of capital without adequately preparing the economic groundwork is ill advised. As John Seldon so eloquently put it, "'tis not the drinking that is to be blamed, but the excess".

Bibliography

Brodie, Niamh (1996) "Speculative Bubbles, Irrationality and Chaos" in *Student Economic Review.*

Camdessus, Michael (May 1995) "Drawing Lessons from the Mexico Crisis: Preventing and Resolving Financial Crises - The Role of IMF".

Camdessus, Michael (27 May 1996) "Argentina and the Challenge of Globalization" in a *Speech to Academy of Economic Science, Buenos Aires*.

Council on Foreign Relations (1997) "Lessons of the Mexican Peso Crisis" in *Report of an Independent Task Force.*

The Economist (22/1/94) "Emerging, submerging¹/₄".

The Economist (30/1/94) "Money and Politics: Financial Crises in Mexico".

The Economist (8/4/95) "The Tequila Hangover".

The Economist (23/12/95) "Ten Lessons to Learn".

The Economist (31/8/96) "Are Crashes Catching?".

The Economist (26/7/97) "Just What the Doctors Ordered".

The Economist (22/8/98) "Emerging Market Measles: Contagion in Emerging Markets".

The Economist (3/10/98) "Reforming World Finance: Lessons from a Crisis".

The Economist (19/10/98) "The Bankers Take Cover".

The Economist (31/1098) "Is Financial Contagion a Myth?".

Eichengreen, Barry, Andrew K. Rose & Charles Wyplosz (July 1996) "Contagious Currency Crises" in *National Bureau of Economic Research Working Paper* 5681.

Francis, David (1 Sep 98) "Why Markets Tumble Together" in *Christian Science* Monitor.

Frankel, J. & K. Froot (May 1990) "Chartists, Fundamentals and Trading in the Foreign Exchange Market" in *American Economic Review*.

Fraser, Damian (11 Apr 1994) "Survey of Latin American Finance (3)" in *The Financial Times.*

Galang, Jose (23 Feb 1994) "World Stock Markets" in *The Financial Times*.

German, Clifford (4 Mar 1994) "The Stock Markets" in The Scotsman.

Grant, Jeremy (7 Sep 1998) "Latin America gets Dose of Reality" in *The Financial Times*.

Hermalin, B. & A. Rose (1978) *Risks to Lenders and Borrowers in International Capital Markets.*

IMF (95/18) (06 Apr 1995) Press Release.

IMF Survey (March 1998) Interview with Claudio Loser 27 (5).

IMF (1998) "Article IV Consultation with Chile".

Kindleberger, Charles (1978) Manias, Panics and Crashes. New York.

Krugman, Paul (1997) *International Economics: Theory and Policy.* Addison-Wesley: New York.

Krugman, Paul (1995) Dutch Tulips and Emerging Markets.

Krugman, Paul (1998) Currency Crises: MIT Press: Cambridge MA.

Krugman, Paul (1998) Curfews on Capital Flight.

Krugman, Paul (5 Oct 1998) "The Confidence Game" in The New Republic.

Mallet, Victor (3 Jun 1994) "Tiger Cub Starts to Find its Feet" in *The Financial Times*.

Martinez, Guillermo Ortize (June 1998) "What Lessons Does the Mexican Crisis hold for Recovery in Asia?" in *Finance & Development*.

Molinski, Michael (1996) "Mexico 'Tequila Effect' May Claim More Victims, Economists Say" in *Bloomberg Business News*.

OECD (1998) "Mexico Economic Survey"

OECD Statistics Quarterly GDP (November 1998) "Gross Domestic Product, Volume" in *Quarterly National Accounts Database*.

Prestridge, Jeff (8/5/94) in *Sunday Telegraph*.

Riding, John & James Kynge (13/1/98) in *Financial Times*.

Sachs, Jeffrey, Aaron Tornell & Andres Velasco, (May 1996) "Financial Crises in Emerging Markets: The Lessons From 1995" in National Bureau of Economic Research Working Paper 5576.

Seldon, John (1689) Table Talk.