

## Notes on Contagion Measures

Thomas Willett

One standard approach to measuring contagion is to look at the change in correlations before and after a crisis. See, for example, Baig and Goldfajn (1998) and (2000) and Forbes and Rigobon (2000). This is quite relevant for designing portfolio diversification strategies, but much less so for policy issues. In terms of harm to the victim what is most relevant is how much their borrowing costs are raised (or stock market declines) as the result of a foreign crisis (a level effect) not how much the correlation of their financial markets increases with respect to a foreign market. Of course increased volatility will also carry some costs so increased volatility in foreign markets would generate some imported instability, but this is likely to be of secondary importance. Simple comparisons of before and after correlations do not get at either effect directly. What one should do is investigate the two types of effects separately. To capture the level effect one would look at the change in levels over a fairly short time period surrounding the initiation of a crisis. Of course for each individual country some of this change could be driven by other factors. Looking at the average change over a group of countries would reduce this problem. The complication here is that we would not expect for all countries to be hit by the same amount. To deal with this we should control for underlying variables as in Bussière and Mulder (1999), Dell' Ariceia et al (2000), and Nitithanprapas and Willett (2000).

For the second effect one would look at the increased volatility of domestic markets to developments in either the ground zero country (area) or that plus the additional volatility generated by the increased volatility in other countries. This would be a function both of the increased variability in the ground zero area and the increased correlations. This would be measured starting immediately after the level adjustment period and last as long as there continued to be high variability in the ground zero country (Note: for the Asian crisis we probably need to deal with two ground zeros: Thailand and then Taiwan-Hong Kong).

Baig and Goldfajn (2000) also look at before and after impulse response functions from Russia and Brazil. I think this again confounds the level effect of the initial stock with whatever increase in interdependence comes after that.

## Main Definitions of Contagion

- I) “A gets in trouble because B does”  
Hernández and Valdes, “What Drives Contagion” WP/01/29
- II) Significant increase in correlation  
(before or after Forbes and Rigobon’s adjustments for significance).
- III) Bazdresch and Werner also use VARs to look at current and lagged effects of innovation abroad on domestic financial prices. Use daily data for 3-month span beginning 2 weeks before crisis and give charts of the impulse response function to for innovations.  
Effects from the Asian sovereign spreads “were small but long lasting” p.311. For Russia and Brazil the effects were much larger.
- IV) B&W also estimate Hamilton regime switching models for the Russian and Brazilian crises. They find evidence of some contagion coefficients for Russian and Brazilian rise substantially during the volatile periods (Brazilian stock market .025 to .30, sovereign debt .005 to .68).

Baig and Goldfajn raise questions about the Rigobon test arguing that they are not sure you should control for the increased variances since “volatility is an integral part of any crisis scenario” p.19 MS

- Pritsker “ A shock in one market or country, that is transmitted to another market or country, but it is not related to fundamentals”
- Calvo and Reinhart (1996) use term “fundamentals-based contagion”
- Claessens, Dornbusch and Park “Contagion is best defined as a significant increase in cross-market linkages after a shock.” p.36

*[What does this mean?]*

- Baig and Goldfajn “The Russian Default”  
“One can define contagion as co-movements in financial variables in excess of those that can be explained by co-movements of fundamentals.  
p.19

- Calvo Favero and Francesco Giavazzi “Looking for Contagion: Evidence from the 1992 ERM crisis”

“Contagion as a change in the way shocks are transmitted across countries that is not caused by a change in fundamentals, but rather by some specific ‘disease’. This is a shock of unusual magnitude.” p.2

### **Channels of Contagion**

Forbes and Rogobon (NBER WP7558, 2000)

Crises vs Non Crisis Contagion

#### Crisis Channels

- 1) Multiple equilibria
- 2) Endogenous liquidity
- 3) Political Economy (Drazen)

[We should discuss that (1) can but doesn't have to be arbitrary.]

- Panic  $\Delta$  in rules of game
- Wake up call

#### Non Crisis Channels

- 1) Trade
- 2) Policy Coordination
- 3) Country Reevaluation and learning
- 4) Common shock

They argue that after Russian crisis Brazil and Venezuela were the Latin American countries generally considered to be most vulnerable.

Stijn Claessens and Kirstin Forbes, “International Financial Contagion: An Overview of the Issues and the Book”

“Not only were the financial crises of the late 1990’s different from their precursors, but it quickly became apparent that the standard theories explaining and predicting crises were no longer applicable.” p. 5

*Is this true?*

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What We Learned:

Importance of being clear about definitions

“One of the most consistent results from the case studies is that real linkages and macroeconomic policies were critical in determining a country’s vulnerability to contagion” p.13

Directions for Future Research:

1. Empirical Analysis of the Financial Channels for Contagion

“Hedge funds are obvious candidates to blame for contagion.” p.14 but little research

2. Detailed Case Studies

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Well regulated markets like US were hit *so how important can better standards be in helping EM’s?*

*Could common standards and more transparency increase rather than reduce contagion?*

## Bazdresch and Werner Summary of Masson

- 1) Common shock
- 2) Interdependence
- 3) Shifts in market sentiment unexplained by macroeconomic fundamentals – pure contagion.

→ Note we should mention that financial and balance sheet problems need to be included under macroeconomic. I think the failure to do this was a major contributor to the view that many of the attacks in Asia were unjustified and hence the need for the CCL.

### Types of tests (continued)

Gelos and Sahay for transition economies is one of the few studies that looks at correlation among exchange market pressures as well as among financial markets.

For EMP they find the correlations can be partly explained by trade links but not by restrictions on portfolio flows, financial links, or the degree of macroeconomic similarity. (p.330 GK)

“High frequency data show that propagation mechanisms were weak during the Asian and Czech crises, but strong during the Russian crisis.” p.330 GK

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Francesco Caramazza, Lucca Ricci, and Raul Salgado “Trade and Financial Contagion in Currency Crisis” WP/00/55

For exchange rate market pressure they use detrended  $MO \Delta$  in R & Ex. R and a 6 month window and threshold of  $1.645 \sigma$ .

They have many more cases of crises than EWS.

For ERM -16, Mexico 9, Asia 10, and Russia -13

For pattern they find Mexico mainly LA, Asia mainly Asia, and Russia “mainly the Eastern European transition economies but also some Latin American countries,” p.8

They found common lenders correlation of the stock market with that of the first hit country to both be significant.

They also find “Emerging market crises do not appear to differ across time periods and regions once we control for the variables in the benchmark model,” p.27

“Each of the three crises was regionally concentrated,” p.27

However, where underlying variables are considered regional dummies are not significant.

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Hernández and Valdès “What Drives Contagion” WP/01/29

Def: “A gets in trouble because B does”
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They argue that “Isolating the relevant contagion channels is key from a policy perspective for appropriate prescriptions may vary depending on the nature of what drives contagion.” p. 3

[They test for several different types and conclude that the importance of channels vary across crises. For Russia the only significant channel was financial.]

**TW:** This is undoubtedly true but they don’t push it very far. The examples they give are that if the contagion is due to trade linkages, you have few alternatives other than diversifying trade or adopting a fixed rate to stop speculative attacks. The latter prescription has the problem, however, that if speculation behaves then it could be better to have flexible rates to help avoid having to deflate or inflate.

For financial linkages they suggest prudential capital account regulations.

Their results suggest diversifying trade will reduce susceptibility to contagion in stock markets but not bonds.

Chang and Majmoni make the same general point in their paper on “International Contagion: Implications for Policy” in the new book. They model two channels that proxy moonsonal and spillover channels.

I haven’t found yet a good fairly comprehensive discussion of appropriate types of policy responses to different channels and I suspect in some cases the appropriate response may be independent of the channel, especially if one considers rational and irrational herding as two different channels.

We might want to make some analysis along these lines, a major focus of section IV.

Chang and Majnomi argue that with 'pure contagion' international assistance is Pareto improving while for other types of contagion policy evaluation is more involved. They argue that no one policy is likely to archived a best insulation from contagion (p.22 of Manuscript) and that typically one would want to use different combinations of liability management, exchange rate policy and structural reforms.

Kaminsky and Reinhart "The Center and the Periphery" argue that unless the shock hits the financial centers it doesn't become systematic. LTCM and the Brazilian devaluation "had little impact on the markets."

They argue that following Russia, Columbia's deep crisis was primarily home grown as was the spike in interest rates in Greece. (Columbia, Zimbabwe, and Brazil are the only three currency crises immediately following Russia identified by the EWS group.]

De Gregorio and Valdes "Crisis Transmission" look at the 80s debt crisis, Tequila, and Asian crises using PI,  $\Delta$  in RER, and crisis indices.

They find that at 3 months neighborhood effects dominate while at 12 month fundamentals matter.

They find the Mexican devaluation at end of 94 "did not produce significant contagion." p.3 **Man**

They also don't find that capital controls reduce contagion (using a 0, 1, 2 dummy).

Forbes and Rigobon (2000) distinguish shift contagion from interdependence and argue that only with the first type can isolation strategies be effective.

[TW: I think there are some qualifications to this such as temporary shocks to fundamentals.]

Forbes and Rigobon (2000) emphasize shift contagion vs. interdependence. They argue the policy relevance of the former is that only when it occurs can isolation strategies be effective.

[TW: I think they miss that interdependence effect through financial markets could be worth trying to isolate if the external shock is temporary.]

Some argue only certain transmission mechanism constitute contagion, pure contagion (not based on fundamentals)

*Do fundamentals include learning?*

### **Crisis and Non Crisis Theories of Contagion**

Leonardo Hernández and Rodrigo Valdes WP/01/29

“A simple definition of contagion is that country A gets into trouble because country B gets into trouble.” p.3

Eichengreen et al. Crisis in one country increases probability of crisis in others.

H & V argue you need to know the channels of transmission in order to derive policy.

Baig and Goldfajn “Russian Default”

Sovereign spread correlations are much higher than those for stock markets.

They have high frequency data that suggests that it was Russia rather than LTCM that triggered the run on Brazil and that it was primarily foreign rather than domestic money that ran.

Kaminsky, Lyons, and Schmukler “Economic Fragility, Liquidity, and Risk”

After Mexico “capital inflows resumed for most countries within six months (p.3 MS).

“The Tequila crisis did not have any spillovers in Asia or the Transition Economies.”

In the Tequila crisis mutual fund withdrawals were greatest for Brazil and Venezuela “these were the only two countries in Latin American with vulnerable economies” (p.15).

[EWS has Columbia 95:08]

[Venezuela had one before in 94:05 and considerably later in 95:12 and 96:04.]

There were discussions of attacks on Argentina after Mexico, but are recorded as big ones. My paper with Nitithanprapas (“A Crisis Model that Works”) argues, however, that precision weights, like EWS uses, will understate unsuccessful attacks on pegged rate countries.

Claessens, Dornbusch, and Park “Contagion: Why Crises Spread and How This can Be Stopped”

“The exact causes of this (capital flow) volatility are not yet known,” p.20 GK

They refer to “the apparently high susceptibility of international capital markets to contagion” p. 20

“Since the exact causes of contagion are not known, neither are the precise policy interventions that can most effectively reduce contagion” p. 21

Empirical Evidence of Contagion

“Empirical tests for evidence of contagion have largely focused on co-movements on asset prices and less on “excessive co-movements of capital flows or disturbances in real markets” p.28.

### **Types of Tests**

1. Correlation of asset prices
2. Conditional probabilities

Trade channel appears to be more important for Latin American than East Asian.

“Tests... find strong evidence that contagion is related to trade links and has a regional nature.” p.32

3. Volatility Spillovers

GARCH - so it doesn't control for fundamentals.

4. Capital flows tests

“There have been few tests of the co-movements in capital flows, which can provide best insights into the channels of transmission for contagion” p.33

5. Other tests

Ahluwalia (2000) "Discriminating Contagion" IMF WP/00/12  
Importance of macroeconomic similarities

C, D, & P (continued)

"These findings suggest that much of the co-movement between markets is unavoidable since it reflects trade and other real linkages" p.34

"It is clear that, whatever reforms occur, liquidity crises will still arise" p.35

"It is difficult to separate, in theory and practice, rational from irrational investor behavior and whether irrational investor behavior is the sole source of contagion" p.36

[TW: I agree with the first part, but doesn't this quote from p.34 disagree with the second?]

Santiago Bazzdrusch and Alejandro Werner "Contagion of International Financial Crises: The Case of Mexico"

They argue that Asian crises first hit Latin America through effects on commodity prices.

Brazil's devaluation had little contagion effect because it was widely anticipated. "The contagion from the Russia crisis to Latin America was magnified by the general perception in the market that the situation in Brazil was unsustainable." P.5 MS

The depreciation for Mexico, Australia, Canada, and New Zealand helped diminish the real effects of the shocks and didn't undermine the credibility of the Monetary authorities.

Yung Chul Park and Chi-Young Song in "Financial Contagion in the East Asian Crisis" give an example of the "innocent victims" view.

They question "...how a country with strong fundamentals like Korea could become a victim to a currency crisis..." p.2 ms

They argue "the stock market crash of Taiwan and Hong Kong sparked off the exodus of institutional investors out of Korea" p.3 ms

They argue "The East Asian crisis should in a large measure be attributed to the panic reaction and herd behavior of foreign investors rather than a deterioration in fundamentals..." p.3 ms

Park and Song (Continued)

Their interpretation of the second phase of the Asian crisis is “When foreign banks and institutional investors saw that such a stable country like Taiwan with strong fundamentals was vulnerable to the crisis in Southeast Asia, they must have concluded that both Hong Kong and Korea would not be immune from the crisis.” p.2 ms

Kaminsky, Lyons, and Schmukler “Economic Liquidity, Fragility, and Risk”  
additional

“The Thai crisis engulfed –within days – Malaysia, Indonesia, and the Phillipines” p.1 ms

They argue that Taiwan, Singapore and Hong Kong were hit although “These economies did not show at that time any signs of fragility” p. 16 ms

“The Asian flu... triggered currency turmoils in Argentina, Mexico, and Chile”  
p.5 ms

[Note that none of these show up in the EWS list.]

“Until very recently, contagion was more of a regional character. The 1990s changed that.” p.5

Eichengreen, Hale, and Moody

“Research on Contagion is dominated by two approaches. One focuses on changes in the likelihood of a devaluation or currency crisis in a country when similar events occur in neighboring countries... The other looks for changes in the correlation of stock, bond, and exchange – market returns across countries in periods of financial turbulence” p.133

“...Both of these approaches...are...vulnerable to the common – unobservable – shocks – critique...” p.133

Rather than trying to model contagion,

Develops the distinction between fundamentals and market sentiment

“...Eastern Europe and Central Asia were disproportionately affected by the events of August 1998” p. 144

E, H, & M (continued)

Latin America tends generally to have more effects on spreads and less on quantities.

After the Mexican crisis increased spreads in Latin America decayed slowly – not fully going away until 1997.

After the Asian crisis “the quick recovery of sentiment is striking, given the severity of the crisis” p.146

“Contrary to much informal discussion, it would appear that high observed spreads in East Asia in the first half of 1998 reflected the deterioration in fundamentals more than any shift in market sentiment or flight to quality” p.146.

Models of complete information suggest spillover will generate through xxx while models of asymmetric info suggest will affect Q’s and both high and low quality borrowers “since it is difficult for investors to tell them apart”

“Collapse in the volume of new xxx in the works of each of the xxx of the 1990s” p.130

Chart p.131, Vol. of EM bonds

1. Suggests full recovery to Mexico after 1 q.
2. Asia never recovered to previous 2 q high, but back to high before that after 2 q’s.
3. Russia recovery after 2 q’s

Repercussions of Mexico were limited than Asian and Russian.

Changes in market sentiment largely limited to region for Mexico and Asia [*What about Russia?*]

↑ing share of sovereigns in borrowings.

Tilak Abeysinghe “Thai Meltdown and Transmission of Recession Within the ASEAN 4 and NIE 4”

“... a fairly large group of economists argue that the ‘instability and asymmetry’ of the global financial system was the prime cause of the Asian Crisis” p.226.

“Instability is a part of capital markets, which are subject to panic runs that are difficult to explain by logic alone” p.226

Asymmetry between center and periphery

“The rules of the game are biased toward the center. In bad times it is the periphery that ends up suffering” p.226

“The speed at which the Asian economies were impacted tells us that it was a result of direct shocks created by ‘pure contagion,’ which has little to do with fundamental linkages” p.237

Kee – Hong Bae, G. Andrew Karolyi, and René M. Stulz “A New Approach to Measuring Financial Contagion” Any 2000 (from WB Contagion Site)

They start “It has generally been perceived that the adverse currency and stock market shock that first affected Thailand in July 1997 propagated across the world with little regard for economic fundamentals in the affected countries” p.1

They argue “An important difficulty with investigations of contagion that focus on correlations is that they assume a linear propagation mechanism, where contagion is proportional to returns. None of these concerns expressed about contagion seem based on a linear propagation mechanism... one would expect large negative returns to be contagious in a way that small negative returns are not.” p. 2

They abandon correlations and look a large absolute value daily return.

[TW: This sounds a little like our level effects.]

They find there’s more contagion from big changes than linear models would predict.

They use a measure of joint occurrences of large returns, which they call “co-exceedances”

They argue that an approach from the epidemiology literature – the multinomial logistic model, is useful for studying financial contagion. It's similar to multivariate extreme value theory applications.

They find more contagion in Latin America than in Asia, and find negative returns more contagious in Latin America, while positive and negative are symmetric in Asia.

Use daily returns from the IFC

EM database for 17 countries

“The key presumption of our approach is that contagion is a nonlinear phenomenon’ p. 31

They also find that contagion from Latin America to other regions is greater than for Asia [which is surprising to me, TW] and that “Contagion is predictable conditional on prior information” p. 32

Glick and Rose “Contagion and Trade”

Regional nature of crises

“We have found strong evidence that currency crises tend to spread along regional links” p.298

“Our evidence is correlated with the hypothesis that the regional spread of currency occur through trade linkages” p.300

“This suggests the importance of enhanced international monitoring on a regional basis” p. 300

Mark Taylor “Capital flows also tend to have a strong regional bias” p. 307

Issue “Degree to which trade linkages were proxying for financial linkages through their common correlation with geographical proximity” p.309

Multicollinearity problem

Kirstin Forbes and Roberto Rigobon “Contagion in Latin America” NBER WP 7885, Sept 2000

Shift contagion sign  $\uparrow$  in cross-market linkages after shock. The standard tests are biased. There’s little evidence of contagion, it’s just interdependence.

Defines contagion as “propagation of shocks in excess of that which can be explained by fundamentals” p.1

After R crisis, Brazil and Venezuela were the two L.A. countries generally expected to be most vulnerable.

Does learning based on IMF behavior count as a fundamental?

The main stock market in L.A. had been falling before the R crisis

No noticeable effect of TH –not until HK was there a big effect.

Definition of shift contagion has a number of advantages (p.13)

1. Empirically useful simple test
2. “it is extreme valuable in drawing policy conclusions” p.13
3. Appealing based on intuition and preconception

Some argue only certain types of transmission mechanisms constitute contagion

Theories of Contagion: Crises and Non Crises Contagion

C.C.

- a. Multiple equilibria
- b. Endogenous liquidity
- c. Political Economy

- a. Crises as sunspots

Mullainathan (1998) memories correlated.

“This branch of theories can not only explain the bunching of crises, but also why speculative attacks occur in economies that appear to be fundamentally sound” p.16

Drazen (1998) one country devaluing takes political pressure off of others.

### Non Contagion Theories

1. Trade
2. Policy coordination
3. Country revaluation on learning
4. Common shock

[F & R, 1999] excess interdependence

Policy implication

If just shift contagion temporary channels only during crisis then SR isolation strategies can be effective.

If permanent channels – only delay adjustment

[But the shock could be temporary.]

“Evidence suggests most shocks are transmitted through non crisis contagional channels” p.33

Notes on Hernández and Valdes “What Drives Contagion” WP/01/29 IS3-1400735442

Uses definition “Country A gets into trouble because country B gets into trouble”

Investigate “the channels that explain cross-country co-movement during crisis period”

Alternative Definitions:

1. ↑ in co-movements
2. Co-movements unexplained by common shock

“Isolating the relevant contagion channels is key from a policy perspective, for appropriate presumption may vary depending on the nature of what drive contagion” p.3

If trade linkage is the cause you have few alternatives other than diversifying trade or adopting a fixed rate to stop speculative attack.

If financial linkages are the cause then perhaps prudential capital account regulation will help.

Financial indicators sovereign spreads and stock market returns

3 channels:

1. Direct trade competition
2. neighbor effect that could xxx financial linkages
3. Financial competition in banking center

Weekly indices for 3 month following T, R, & B

1. Direct trade: via competitive devaluation
2. Macroeconomic similarities – wake up call
3. Financial linkages
  - a. Direct cross country investments
  - b. Treated as complementary xxx based on rules of xxx  
Fixed wts, portfolio rebalancing
  - c. Liquidity – EM claims illiquid
  - d. Informational asymmetric and herd behavior  
Calvo (1999) margin calls and asymmetric info

Alt definition of contagion used by Glick and Rose based on degree of closeness to ground zero country.

Rudiger Dornbusch, Yound Chal Park, and Styn Claessen “Contagion: How it spreads and How it can be stopped”

“After the East Asian crisis and the spread to Russia and Latin America in 1998, the notion of excess volatility in international capital markets has become more widely accepted in policy circles” p.3

No uniform definition

“Spread of market disturbance” p.4

## 2 Categories:

1. Normal interdependence  
Fundamentals based contagion
2. Not linked to fundamentals “solely the result of the behavior of investors or other financial agents”

### Fundamental Causes

1. Common shocks
2. Trade Links and Competitive Devaluation
3. Financial Links

### Investor Behavior

1. Liquidity and incentive problems may be different problem across types of investors – leveraged investors
2. Information asymmetries and coordination problem

More diversified investors are less informed and it's more costly to establish reputation so more incentives to follow the herd

Kim & Wei in JIE (2002) focus on this:

Multiple Equilibria

Change in Rules of Game

“Empirical explanation on the evidence for contagion have largely focused on co-movements in asset price and much less on ‘excessive’ co-movements in capital flows or disturbances in real markets” p. 10

Conditional Probabilities

Evidence for trade channel

Importance seems more relevant for L.A. than Asia.

Volatility spillover – GARCH

## Capital flow tests

“These findings suggest that much of co-movements is unavoidable as they reflect trade and other linkages” p.16

“Much of current debate on reforming the international financial architecture is aimed at reducing the risks of contagion” p.17

“Contagion is best defined as a significant increase in cross-market linkages after shock to an individual country (or group of countries)” p.17

“The way in which shocks are transmitted do seem to differ... during times of crises” p.17

## Baig and Goldfajn “The Russian Default and Contagion to Brazil” WP/00/160

“One can define contagion as co-movements in financial variables in excess of those that can be explained by co-movements of fundamentals” p.19

## Re Rigobon Test

“We are not sure a study of contagion ought to control for the increased variance, as volatility is an integral part of any crises scenario. It could very well be that the factors behind the increased variance... are precisely what make up contagion, and controlling for the factors make the test for contagion lose power” p.19

They control for fundamentals with “news”

Need to pick tranquil period to compare with crises.

Used Jan 1 to May 30, 1997 for crises, use Jan 1, 1998 **xxx** for correlation and VAR analysis. For regression, used dummy from July 1, 1998.

## Stock Market

### Correlations rise

They find significant impulse responses in Brazil from Russia only during crisis period.

They don't test for whether all of this comes from the beginning of the crisis (i.e. the level effect).

Sovereign spread correlations are much higher than for stock markets. The IR ~ show mutually reinforcing response during the crisis period.

They have data for transactions that go through official or parallel market that allows them to proxy domestic versus foreign or capital flows. This suggests that it was foreign funds that were the primary cause of the run on the real.

They also have high frequency data that suggests that it was Russia, not LTCM that had the big impact.

For Asia crisis, they find that local players preceeded foreign investors.

Also found in Frankel and Schmukler (1996)

They refer to “the contagion for Russia” being “triggered by foreign investors panicking.” p.36

Don’t see anything in the new data to suggest domestic causes.

Garry Schinasi and R. Todd Smith “Portfolio Diversification, Leverage, and Financial Contagion” WP/99/131

Portfolio diversification and leverage may be enough to explain contagion without invoking market imperfections.

Contagion creating “market turbulence contagion selling of high risk assets

Most portfolio allocation rules, not just VAR, → ↑ increased volatility will generate rebalancing.

Calvo (1998, 1999) signal extraction problem. Informed investors are likely to be leveraged and hence subject to margin calls.

Volatility event or capital event

Mauro et al “Emerging Market Spreads: Then Versus Now” WP/00/190

Neither currency nor banking crises have been more frequent in 90s than 70s or 80s.

Consider number of sharp ↑ in spreads proportion of such changes that affect more than one country at a time.

The principal components analysis

M. (continued)

Level approximately 300 in pre 90s 800 now

Corr .77 now, then .4

More external causes of changes now

Their suggestion is that there was more individual investing then. Now more through investment funds. Tended to liquidate in many EM's.

“To maintain a given rich and liquidly profile” p.38

Kaminsky and Reinhart argue that the disturbance has to hit center country markets for the contagion to be strong.

Question: *Why did Thailand start a contagion of speculative attacks in Asia but the Czech float have a much smaller effect on the transition economies?* (See Gelos and Sahay – incidentally their paper is one of the few that looks at both speculative attacks and financial market contagion).

Kaminsky, Lyon and Schmukler suggest countries with liquid markets are hit with bigger portfolio outflows during contagion.

They argue Tequila crisis was short-lived – capital inflows resumed within 6 months – and limited to Latin America. Most serious hit by mutual funds were Brazil and Venezuela who were vulnerable.

[Argentina?]

Currency Crises during recent contagion episodes as calculated by EWS group:

#### Mexico

Columbia? (95:08), Mexico 94:12

Venezuela 95:12, 96:04 (also 94:05)

#### Asia

Indonesia (98:01 and :06), Korea (97:11 and :12), Malaysia (97:07, :08, :12, and 98:01), Philippines (97:12), Thailand (97:07, :08, :12 and 98:01), Zim (97:11 and 98:08)

Russia

Brazil (99:01), Columbia (98:09)

Turkey (2001:02)

Woochan Kim and Shang-Jin Wei “Foreign Portfolio Investors Before and During a Crisis” JIE 2002 77-96

no K data on individuals

“Foreign investors outside Korea are more likely to engage in herding than the branches/subsidiaries of foreign institutions in Korea or foreign individual living in Korea” p.77

Has review of feedback trading

Fw I	R (500)	$\sim e^{-K}$
Dec 27, 1996	4.0	7.9
Nov 29, 1997	5.9	4.4

Momentum trading

R no

$\sim R$  yes – increased during crisis

Individual investor displays some evidence of **xxx** to negative of G.

Positive feedback trading gave negative **xxx** adjusted **xxx contraction xxx**.

Except for the Korea subs 7 branches of Foreign Institutions engaged in **sign** hedging.

FI outside herd more than inside

Individual investor herd more than **xxx** info asymmetry.

Don't tend to profit consistently from herding

FI about 15%

Philippe F. Delhaise Asia in Crisis

John Wiley & Sons (Asia) Singapore 1998

Banker and Bank Analyst

“The panic that swept through the regions like a brush fire as a contagion epidemic devastated the region’s currencies and equities well beyond what was reasonable” p.2

“The panic did have its origins ... in a crisis of fundamentals” p.2

“The main reason why the banking system xxx is the quality of financial management. Most commercial banks of Asia are run like pawnshops” p.2

“...absent the panic, it would have been a string of domestic crises, not a regional collapse... inflicting xxx devastation to all” p.2

“The panic on currency and stock markets... represents merely the transmission belt that carried the contagion from one country to another” p.2

“The transmission belt of the crisis was perception...” p.12

“On the panic side, there were nervous lenders calling back their loans and nervous investors cutting down and then reversing the flow of funds. There were also Asian borrowers rushing to the exit... pp.14-15

On the fundamental side, there was corruption, cronyism, mat investment , and rotten banking systems. P15

... I would suggest that it is the panic side that inflicted the heaviest damage.” p.15

“... the Asian currencies and the stock markets... fell beyond reason, in turn affecting the ability of borrowers to meet their obligation. This created a vision xxx of negative perception leading to further deterioration” p.15

“The sheer size of money awaiting opportunities to partake in the phenomenon growth of Asia was vastly superior to what Asia could comfortably swallow... Asia was literally swamped with money” p.16

“The capital directed at Asia was never priced efficiently... Capital was divested from its most efficient uses” p.17

“Asian firms borrow too much. Financial intermediation is too high in Asia.

“Bank loans are, by definition, much less stable than other kinds of financing” p.27

“Currency and equity markets reacted wildly” p.30

“The panic that started in Bangkok on July 2, 1997 had more to do with sentiment than with fundamentals. It fed on itself to engulf the whole region” p.31

Ross H. McLeod and Ross Garnaut eds. East Asia in Crisis: From Being a Miracle to Needing One, Routledge 1998.

Garnaut “The East Asian Crisis”

3 sources of contagion

“One was the realization that presumed government guarantees of currency parities, and in various ways of bank solvency and the way profitability of other enterprises could not be taken at face value” p.14

“The second source of contagion was the realization by investors that they had a poor understanding of the workings more generally of the economies to which they were exposed” p.14

3<sup>rd</sup> Interdependence

McLeod “The new era of financial fragility”

“... ‘financial panic’ may be described as an episode in which large number of economic entities suddenly change their financial behavior... simply because they observe other entities doing so. This is often described as ‘herd behavior’, but it is not necessarily irrational” p.336

“...act in a manner that amplifies any initial disturbance” p.336

This would appear to be a large part of the East Asia crisis story.

“In Indonesia’s case... the sudden float and devaluation of the baht in neighboring Thailand, and then the ringgit in Malaysia, triggered a re-evaluation of risk exposure of all kinds which, in turn, brought on **pressing** the changes in asset and **xxx volumes** that investors feared” p.337

“The first such reevaluation in Indonesia related to exchange risk. Private sector foreign debt was of the order of US \$ 70 billion, 83% of it unhedged...

Borrowers began to rush to buy dollars in early July 1997, as did domestic and foreign entities holding rupiah-denominated deposits and other financial assets”

Business euphoria, or more precisely the lack of attention to risk, before crises.