Loan Flows, Contagion Effects, and East Asian Crisis

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Abstract

In this article, we assess the extent of contagion by examining international loan flows by banks reporting to the Bank for International Settlements (BIS). We find that contagion in the international loan market is not systematic or global in nature; rather it is limited to specific borrowing groups or geographic regions. While increased correlations among loan flows (contagion) are evident during periods of crisis for East Asian countries, such is generally not the case for Latin American countries. We also find that sharp reductions in loan flows to the countries during the crisis period are often unrelated to the economic growth of the countries over that time.

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Among the debates that regained interest after the East Asian financial crisis is the one concerning "contagion". The financial crises that followed the devaluation of the Thai baht in July 1997 subsequently spread to other countries in East Asia.[1] Undisciplined foreign lending and volatility in the inter-bank loan market aggravated the inherent weaknesses of these countries, such as overvalued currencies and inflated asset prices. Asian countries experienced a substantial decline in bank lending, from net *inflows* of $40 billion in 1996 to net *outflows* of over $30 billion, amounting to seven percent of GDP.[2]

At a time of financial crises, reversal of capital flows from one country may lead to a similar withdrawal from other countries, a phenomenon known as contagion. A small shock in one country can spread by contagion to an entire region as banks reduce lending to *all* borrowers in a region. Kaminsky and Reinhart (1998b) suggest that financial sector linkages, either through the inter-bank market or through international capital markets, are largely responsible for propagating shocks in recent crisis episodes. Corsetti, Pesenti and Roubini (1999a) also emphasize the role of the inter-bank loan market in the recent Asian crisis. Since banks account for a significant portion of firms' financing needs in many (especially emerging market) countries,[3] a breakdown in the mechanism of inter-bank fund transfer may adversely impact the global economy.

In this paper, we assess the extent of contagion by examining international loan flows by banks reporting to the Bank of International Settlements (BIS) over the period 1984-1998. We ask whether there is evidence of increased correlation (contagion)

among loan flows from BIS reporting banks to various borrowing groups during periods of financial crises. We find that contagion in the international loan market is not systematic or global in nature; rather it is limited to specific borrowing groups or geographic regions. While increased correlations among loan flows are evident during periods of crisis for East Asian countries, such is generally not the case for Latin American countries. Also, for both East Asian and Latin America, there is little evidence of contagion in loan flows with countries outside the region.[4] Finally, we find that sharp reductions in loan flows to countries during a crisis period are often unrelated to the economic growth of the countries over that time.

1. The Inter-Bank Loan Market and Contagion

Inter-bank loan flows represent a substantial portion of capital flows---including total bank flows, portfolio flows, and direct investment (figure 1).[5] For East Asia, in particular, more than half of all capital flows has historically originated from banks. In addition, bank flows exhibit substantial volatility, both in Latin America and East Asia. Periods of known financial crises, such as the recent Asian crisis and the Latin American crisis of 1994-96, appear to coincide with volatile loan flows.

The inter-bank loan market encompasses over 1,000 banks representing several countries around the world. Even though the largest amount of transactions in the inter-bank markets occurs in US dollars, a sizable inter-bank market exists in Yen, Sterling, Euro, and other foreign currencies. The primary role of the inter-bank market is to provide an efficient mechanism for reallocating funds from surplus countries to deficit countries. In addition, the inter-bank market provides liquidity to cover a temporary

shortfall of funds domestically or internationally. It also provides a mechanism through which financial institutions can optimally hedge their foreign interest rate and exchange rate risk. Finally, it helps minimize the costs of domestic regulations and taxes (Saunders, 1987).

The inter-bank market is characterized by strong interdependence among banks in the market for uncollaterized claims. This market is fragile due to a diversity of players, the high costs of monitoring borrowers and obtaining information about them, and the absence of an international agency to enforce international debt contracts.

Contagion in the inter-bank market can occur for various reasons. Whatever the causes, however, contagion implies that loan flows to different borrowing groups are highly correlated during a financial crisis. In the simplest case, several countries may be affected by a common economic shock, leading to a correlation in their economic performance over the period of the crises. The extent of contagion depends on the way the different countries in a region are inter-connected, as shown by Allen and Gale (1999). In their model, banks hold claims against banks in other regions. A small liquidity shock in one region can spread by contagion throughout the economy as banks liquidate claims against each other to accommodate the shock.

Another source of contagion is the difficulty of monitoring borrowers in the inter-bank market, according to Rochet and Tirole (1996). These authors demonstrate that a shock to a bank's operations may reduce its incentive to monitor other banks. This can hurt the performance of neighboring banks so that, in extreme circumstances, the inter-bank loan market breaks down.

A shock in one country may be propagated to another country for no fundamental reasons. For example, contagion can develop through a run on an individual bank in the inter-bank market, leading to a systemic bank run due to the close pyramiding of inter-bank transactions (Saunders, 1987). As Sachs and Radelet (1998) and Chang and Velasco (1998a, 1998b) show, such runs need not be triggered by fundamental economic factors. During a crisis, foreign creditors may refuse to roll over the short-term loans to domestic banks, causing domestic depositors to panic and run on the banks. The extent of contagion is larger with greater financial liberalization, which increases the maturity mismatch between assets and liabilities that is typical of commercial banks.

In addition to international bank runs, contagion may also occur when imperfectly informed investors exhibit 'herding behavior' by reacting to a rumor (Calvo and Mendoza (1998)). In the context of the international loan market, Kamin (1999) argues that in the 1994-95 crisis affecting Mexico, many other emerging markets lost their access to international funding and/or faced an increase in spreads over LIBOR.

Finally, contagion in interbank transactions may take place when a bank does not meet its settlement commitments. Settlement risk arises when a major bank does not settle borrowing/lending dollar transactions in the international interbank market at the end of the day. For example, if one bank does not deliver the promised funds at the end of the day, its counterparty may be technically insolvent if its debit position exceeds its capital and reserves. This could potentially have contagious effects on other participating banks in the inter-bank market.

2. Data and Methodology

We analyze contagion in the inter-bank market using data on quarterly loan flows for the period 1984 to 1998. Contagion implies a greater correlation in the loan flows to different countries in crisis times, relative to normal times. For empirical analysis, we identify a country's crisis periods by selecting the 10 quarters with the largest negative loan flows to that country. To make the flows comparable across time, we normalize a country's quarterly loan flows by dividing by the total flows to *all* countries for that quarter. As an example, the ten crises periods identified for S. Korea are *1987:1-3, 1992:4, 1997:3-1998:4*. These periods include the recent East Asian crises, generally thought to have lasted from July 1997 through the end of 1998.

3. Empirical Evidence

Table 1 summarizes the quarterly loan flows for crisis and non-crisis periods from the BIS reporting banks to bank borrowers in different Latin American and Asian debtor countries. The average quarterly loan flows are generally higher for Asian than for Latin American countries, with East Asia and Japan having the highest average loan flows over the 1984-1998 period. For all countries, the standard deviation of loan flows is higher during the crisis periods.

Table 2 shows correlations in bank flows during the crisis (the first cell number) and non-crisis periods (number in parentheses) for Mexico, Brazil, Argentina and Venezuela. Overall, the evidence for contagion is weak in Latin America. There is some evidence of within-region contagion for Mexico and Venezuela, but none for the other countries. For example, when Mexico is in crises, the correlation between Mexico and Venezuela increases from 0.08 in the non-crises periods to 0.61 in the crises periods. For

Venezuela, the correlation with the rest of Latin America is 0.68 in crises periods and only 0.12 in non-crises periods. There is no evidence of across-region contagion, with the sole exception of loan flows between Argentina and East Asia.

Table 3 shows correlations in bank flows for East Asian countries during crisis and non-crisis periods. The evidence for contagion within the region is much stronger than for Latin American countries. For example, when Hong Kong is in crisis, the correlation with Korea, Thailand and Indonesia is much higher in crisis than non-crisis periods. However, contagion across regions is not greatly evident. There is some contagion between the East Asian countries and Japan and between East Asia and Mexico, but not with other Latin American countries.

Our results depend upon the particular way we identify the crisis quarters. To evaluate whether our method of defining crises is reasonable, we repeat our analyses for the recent East Asian crises of 1997 and 1998 (Table 4). These results are broadly consistent with our earlier conclusions. There is even stronger evidence of contagion among the different East Asian nations than before. For example, there was no evidence of contagion among Hong Kong, Singapore and Taiwan previously, but there is now. Interestingly, these three countries suffered least in the recent Asian crisis, as documented by Corsetti, Pesenti and Roubini (1999b). Consistent with the results in Table 2, there is contagion between East Asia and Mexico, but not with any other Latin American countries.

For the Mexico/Argentina crisis of 1994 to 1996 (Table 5), there is little evidence of contagion either within or outside the region, as in our earlier analysis.

Contagion and boom

While contagion is generally associated with crises, a period of high economic expansion may also cause uncertainty for lenders if, for example, the causes of growth are not well understood. Consequently, when there is prosperity in one country, banks may increase lending to an entire region. To test this conjecture, we identify the ten quarters with the largest *positive* loan flows for the Asian countries and compare the correlation in bank flows for these *boom* periods and the remaining quarters. As before, we normalize flows by dividing by the total flows for the quarter.

The results are in Table 6. While there is some evidence for *positive* contagion within the region, the extent of contagion is considerably less than for crisis periods. Evidence for positive contagion is most pronounced for Korea, Singapore and Thailand. Unlike the crisis periods, there is no evidence of contagion between the East Asian countries and Mexico during the boom quarters. Apparently, the increase in lenders' uncertainty is more emphatic during periods of crisis, rather than during periods of strong economic expansion.

Contagion and Common Economic Shocks

To what extent is the increase in correlation during crisis periods (contagion) due to common changes in the underlying economic factors for these countries? We find that the percentage of crises quarters common to the various country pairs is generally less than 40 percent. Since a very high percentage would mean that the various crisis episodes occurred almost simultaneously in the two countries, our results may indicate that contagion is not driven mostly by common economic shocks.

To further examine the role of common economic shocks in creating contagion, we calculate correlations in the real GDP growth of the countries for 1984 to 1997, and for their crisis years.[6] In some cases, country pairs experience large reductions in loan flows even though GDP growth was *above average* in *both* countries. For these countries, GDP growth will be highly correlated in the crisis years even though the economies are *not* in crisis, and so we exclude them when calculating the *crisis* correlations.

Table 7 shows the results. We find that the crisis correlations are generally lower than the sample correlations, implying that contagion occurs when economic growth in the two countries is *dissimilar*. The exceptions, where real GDP growth is highly correlated in the crisis years, are Hong Kong and Indonesia, Singapore and Hong Kong, Thailand and Korea, Thailand and Taiwan, Indonesia and Thailand. This could indicate that, for these country pairs, contagion in bank flows is related to fundamental economic causes. Alternatively, contagion may have led to an initial reduction in bank flows and subsequently *induced* deterioration in economic growth. This is all the more likely since the GDP correlations are yearly, whereas the loan flow correlations are quarterly. Unfortunately, our data does not allow us to distinguish between these contrasting hypotheses.

4. Conclusion

Contagion in the inter-bank market implies that reduction in loan flows to one country is quickly followed by similar reductions in other countries, whether due to common economic shocks or for reasons unrelated to fundamental economic factors. In

the wake of an international financial crisis, the risk of contagion is heightened due to high uncertainty among creditors regarding the true cause of the crisis and the creditworthiness of borrowers.

In this article, we have looked at evidence of contagion in the inter-bank market by examining the BIS data on loan flows to various borrowing country groups. We find that contagion in the international loan market is not systematic or global in nature; rather it is limited to specific borrowing groups or geographic regions. While increased correlations among loan flows (contagion) are evident during periods of crisis for East Asian countries, such is generally not the case for Latin American countries. For both East Asian and Latin America, there is little evidence of contagion in loan flows with countries outside the region. Finally, we find that sharp reductions in loan flows to two countries during a period are often unrelated to the economic growth of the countries over that time.

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[1] For example, the currency contagion "Asian Flu", which began with the flotation of the Thai baht in July 1997, spread to Malaysia, the Philippines, Indonesia, Korea and Hong Kong. Later, it spread across the Pacific to Latin American countries (Glick and Rose, 1998).

[2] World Economic Outlook May 1998. A survey by the staff of the International Monetary Fund, World Economic and Financial Surveys (Washington).

[3] Rojas-Suarez and Weisbrod (1995) show that banks account for between 50 and 90 percent of the financing needs of firms in Latin America.

[4] Other studies supporting the view that contagion is more regional than global are Calvo and Reinhart (1996), Schmuckler and Frankel (1996), and Glick and Rose (1998).

[5] We use data on exchange adjusted flows that augment gross assets of banks in the BIS reporting area. We do not net this increase in assets with the increase in liabilities of these banks, since we assume that when banks make credit decisions, they do so through the asset side of their balance sheet.

[6] We do not include 1998 since figures are not yet available.

Table 1: Summary Statistics

	Full Sample		Crisis		Non-Crisis	
	mean	s.d	mean	s.d	mean	s.d
Mexico	6	1233	0.1546	1848	316	784
Brazil	400	2320	-2568	3250	994	1544
Argentina	89	694	-759	678	259	565
Venezuela	-62	340	11.34	294	301	150
Hong Kong			-23143	19833	9269	12179
Korea			-4060	4362	1525	1946
Singapore			-10969	9084	5768	6263
Taiwan			-1572	888	634	1513
Thailand			-4009	3508	1718	2694
Indonesia			-1271	1141	578	631
India			-286	207	255	320
Latin America (excluding Mexico)	476	2906				
Latin America (excluding Brazil, Argentina, Mexico, Venezuela)	48	653				
Asia	2830	7896				
East Asia	8739	28351				
Japan	7055	32885				

Table 2: Correlation in Bank Flows During Crises and Non-crises Periods: Latin America

	Within Region Contagion						Across Region Contagion		
	Mexico	Brazil	Argentina	Venezuela	Latin America (excluding Brazil, Argentina, Mexico, Venezuela) [3]	Latin America (excluding crisis countries)	East Asia [4]	Asia [5]	Japan
Mexico		0.172	-0.131	0.607	0.359	0.284	-0.191	0.011	-0.010
		(-0.068)	(0.308)	(0.082)	(0.338)	(0.101)	(-0.126)	(-0.028)	(-0.282)
Brazil	-0.327		-0.238	-0.217	-0.228	-0.392	0.105	-0.347	0.084
	(-0.232)		(0.200)	(0.089)	(0.328)	(0.081)	(-0.469)	(0.016)	(-0.475)
Argentina	0.166	0.301		-0.024	0.201	0.301	0.819	-0.010	-0.134
	(0.131)	(0.204)		(0.097)	(0.441)	(0.322)	(-0.228)	(-0.070)	(-0.140)
Venezuela	0.452	0.136	0.434		0.317	0.681	-0.241	0.001	-0.265
	(-0.032)	(0.111)	(0.022)		(0.159)	(0.115)	(-0.135)	(-0.059)	(-0.287)

Source: Bank for International Settlements

Notes:

1. A country's crisis periods are the 10 quarters with the largest negative flows. The flows are normalized by dividing by the total cross border flows for that quarter.
2. Numbers in parentheses refer to correlations in non-crisis quarters. Numbers not in parentheses refer to correlations in crisis quarters.
3. Group includes of Belize, Bolivia, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Falkland Islands, French Guiana, Guatemala, Guyana, Honduras, Nicaragua, Paraguay, Peru, Suriname, Uruguay.
4. Group includes Hong Kong, Korea, Singapore, Taiwan, Thailand, Indonesia.
5. Group includes East Asia, Afghanistan, Bangladesh, Bhutan, British Overseas Territories(includes British British Indian Ocean Territory, Chagos and Pitcairn Island), Brunei, Myanmar, China, Fiji, French Antarctic Territory, Polynesia(includes Clipperton, Gambier, Masquesas, Society, Tuamotu Archipelago and Tubuai), French southern Antarctic(includes Kerguelen Islands, Crozet Islands, Amsterdam Islands, Saint-Paul Island and Terre Adlie, India, Kampuchea, Kiribati, North Korea, Laos, Macao, Malaysia, Maldives, Mongolia, Naurau, Nepal, New Caledonia, Pakistan, Papua New Guinea, Philippines, Solomon Islands, Sri Lanka, Tonga, Tuvalu, US Pacific Islands(includes Canton and Enderbury, Carolines, Howland and Baker, Kingman Reef, Mariana Marshall Islands, Palmyra and Jarvis and Johnston), Vanuatu(offshore center), Vietnam, Wallis and Futuna, Western Samoa.

Table 3: Correlation in Bank Flows During Crises and Non-crises Periods: East Asia

	Within Region Contagion								Across Region Contagion			
	Hong Kong	Korea	Singapore	Taiwan	Thailand	Indonesia	East Asia (excluding crisis countries) [3]	Remaining Asia [4]	Japan	Latin America [5]	Mexico	Brazil
Hong Kong		0.809	0.532	-0.016	0.739	0.734	0.716	-0.926	0.185	0.087	0.347	0.012
		(0.097)	(0.496)	(0.282)	(0.182)	(0.292)	(0.513)	(-0.907)	(0.616)	(-0.053)	(0.011)	(-0.054)
Korea	0.570		0.598	0.235	0.534	0.798	0.667	-0.619	0.415	-0.507	0.182	-0.583
	(-0.020)		(-0.048)	(0.059)	(0.595)	(0.426)	(0.074)	(0.071)	(-0.286)	(0.354)	(-0.005)	(0.262)
Singapore	0.834	0.829		-0.145	0.719	0.790	0.855	-0.910	0.529	-0.550	0.201	-0.542
	(0.219)	(0.030)		(0.065)	(0.093)	(0.018)	(0.214)	(0.484)	(0.428)	(-0.175)	(0.227)	(0.012)
Taiwan	-0.200	-0.372	0.094		-0.539	-0.210	-0.360	0.087	-0.164	-0.589	-0.083	-0.612
	(0.261)	(0.295)	(0.225)		(0.231)	(0.322)	(0.312)	(-0.291)	(0.179)	(0.006)	(-0.078)	(0.054)
Thailand	0.388	0.632	0.352	0.219		0.224	0.462	-0.470	0.266	-0.505	-0.051	-0.341
	(-0.052)	(0.594)	(-0.031)	(-0.180)		(0.224)	(0.005)	(0.043)	(-0.154)	(0.183)	(-0.010)	(0.193)
Indonesia	0.647	0.858	0.823	0.277	0.825		0.819	-0.723	0.558	-0.418	0.178	-0.337
	(0.041)	(0.492)	(0.018)	(0.133)	(0.108)		(0.118)	(-0.045)	(-0.245)	(0.284)	(0.098)	(0.233)
India	0.143	0.059	0.243	-0.333	0.081	-0.262	0.139	-0.105	0.219	-0.525	-0.068	-0.570
	(-0.064)	(0.095)	(-0.129)	(-0.088)	(-0.046)	(0.257)	(-0.094)	(0.103)	(-0.177)	(0.437)	(0.123)	(0.352)

Source: Bank for International Settlements

Notes:

1. A country's crisis periods are the 10 quarters with the largest negative flows. The flows are normalized by dividing by the total cross border flows for that quarter.
2. Numbers in parentheses refer to correlations in non-crisis quarters. Numbers not in parentheses refer to correlations in crisis quarters.
3. Group includes Hong Kong, Korea, Singapore, Taiwan, Thailand, Indonesia.
4. Group includes East Asia, Afghanistan, Bangladesh, Bhutan, British Overseas Territories(includes British British Indian Ocean Territory, Chagos and Pitcairn Island), Brunei, Myanmar, China, Fiji, French Antarctic Territory, Polynesia(includes Clipperton, Gambier, Masquesas, Society, Tuamotu Archipelago and Tubuai), French southern Antarctic(includes Kerguelen Islands, Crozet Islands, Amsterdam Islands, Saint-Paul Island and Terre Adlie, India, Kampuchea, Kiribati, North Korea, Laos, Macao, Malaysia, Maldives, Mongolia, Naurau, Nepal, New Caledonia, Pakistan, Papua New Guinea, Philippines, Solomon Islands, Sri Lanka, Tonga, Tuvalu, US Pacific Islands(includes Canton and Enderbury, Carolines, Howland and Baker, Kingman Reef, Mariana Marshall Islands, Palmyra and Jarvis and Johnston), Vanuatu(offshore center), Vietnam, Wallis and Futuna, Western Samoa.
5. Group includes of Belize, Bolivia, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Falkland Islands, French Guiana, Guatemala, Guyana, Honduras, Nicaragua, Paraguay, Peru, Suriname, Uruguay.

Table 4: Correlation in Loan Flows during the East Asian Crisis

Panel A: Within Region Contagion

	Hong Kong	Korea	Singapore	Taiwan	Thailand	Indonesia	Remaining Asia
Hong Kong		0.668	0.712	0.361	0.279	0.736	-0.951
		(-0.054)	(0.299)	(0.179)	(0.101)	(0.026)	(-0.922)
Korea			0.647	0.568	0.591	0.813	-0.695
			(-0.123)	(0.015)	(0.664)	(0.376)	(0.105)
Singapore				-0.108	0.480	0.621	-0.889
				(0.208)	(-0.039)	(-0.034)	(-0.607)
Taiwan					0.496	0.321	-0.118
					(-0.205)	(0.166)	(-0.235)
Thailand						0.177	-0.392
						(0.209)	(-0.084)
Indonesia							-0.701
							(-0.064)

Panel B: Across Region Correlations

	Latin America	Japan	Mexico	Brazil
East Asia	-0.122	0.566	0.498	
	(0.085)	(0.607)	(-0.036)	
Hong Kong	0.125	0.454	0.447	0.057
	(0.021)	(0.569)	(0.065)	(-0.066)
Korea	-0.462	0.227	0.291	-0.485
	(0.444)	(-0.361)	(0.028)	(0.305)
Singapore	-0.358	0.838	0.609	-0.432
	(-0.086)	(0.595)	(-0.233)	(-0.062)
Taiwan	-0.009	-0.536	-0.228	0.082
	(-0.074)	(0.201)	(0.111)	(-0.078)
Thailand	-0.534	0.128	0.128	-0.427
	(0.361)	(-0.199)	(-0.053)	(0.250)
Indonesia	0.010	0.230	0.068	-0.076
	(0.284)	(-0.168)	(0.102)	(0.288)

Source: Bank for International Settlements

Notes:

1. The crisis period is 1997:2 to 1998:3.
2. Numbers in parentheses refer to correlations in the non-crisis quarters. Numbers not in parentheses are correlations in the crisis quarters.
3. Remaining Asia refers to Asia excluding East Asia and India.

Table 5: Correlation in Loan Flows during the Mexico - Argentina Crisis

Panel A: Within Region Contagion

	Brazil	Argentina	Venezuela	Latin America excluding Mexico	Latin America excluding Brazil, Argentina, Mexico, Venezuela
Mexico	-0.508	0.203	-0.477	-0.100	0.795
	(-0.001)	(0.169)	(0.335)	(0.132)	(0.252)
Argentina	-0.586		-0.784	-0.466	-0.171
	(0.169)		(0.192)	(0.516)	(0.558)

Panel B: Across Region Correlations

	Asia	East Asia	Asia (excluding East Asia)	Japan
Mexico	0.050	0.264	-0.279	0.371
	(0.141)	(0.067)	(-0.036)	(.0.037)
Argentina	-0.474	-0.357	0.324	0.147
	(-0.106)	(-0.009)	(-0.021)	(0.011)

Source: Bank for International Settlements

Notes:

1. The crisis period is 1994:4 to 1996:1.
2. Numbers in parentheses refer to correlations in non-crisis quarters.
   Numbers not in parentheses refer to correlations in crisis quarters.

Table 6: Correlation in Bank Flows During Boom and Non-Boom Periods: East Asia

	Within Region Contagion								Across Region Contagion			
	Hong Kong	Korea	Singapore	Taiwan	Thailand	Indonesia	East Asia (excluding crisis countries)	Remaining Asia	Japan	Latin America	Mexico	Brazil
Hong Kong		-0.411	0.404	0.396	-0.345	0.252	0.292	-0.931	0.736	0.160	-0.311	0.300
		(0.213)	(0.606)	(0.380)	(0.243)	(0.374)	(0.650)	(-0.906)	(0.633)	(-0.034)	(0.029)	(-0.123)
Korea	-0.107		0.394	0.393	0.578	-0.075	0.288	-0.009	0.119	0.209	-0.415	0.176
	(0.034)		(-0.117)	(0.050)	(0.524)	(0.645)	(0.074)	(0.016)	(-0.237)	(0.448)	(0.039)	(0.438)
Singapore	0.510	0.039		0.244	0.084	0.488	0.474	-0.688	0.630	-0.138	-0.224	0.022
	(0.199)	(-0.023)		(0.018)	(0.052)	(-0.041)	(0.176)	(-0.448)	(0.426)	(-0.084)	(-0.144)	(0.093)
Taiwan	0.189	-0.097	0.165		0.055	0.138	0.192	-0.321	0.387	0.432	-0.005	0.372
	(0.348)	(0.364)	(0.244)		(0.248)	(0.404)	-0.381	(-0.344)	(0.175)	(0.097)	(0.061)	(0.103)
Thailand	0.189	0.378	0.615	-0.099		0.263	0.532	-0.525	0.813	0.321	-0.332	0.246
	(-0.106)	(0.595)	(-0.328)	(-0.048)		(0.364)	(-0.142)	(0.198)	(-0.223)	(-0.027)	(-0.045)	(0.038)
Indonesia	-0.287	-0.146	-0.174	-0.009	-0.382		-0.568	0.622	0.291	0.489	-0.172	0.571
	(0.095)	(0.606)	(0.114)	(0.202)	(0.258)		(0.227)	(-0.135)	(-0.238)	(0.225)	(0.126)	(0.152)

Source: Bank for International Settlements

Notes:

1. Numbers in parantheses refer to non-boom quarters. Numbers not in parentheses are for boom quarters.
2. Boom quarters for a country are the 10 quarters with the largest positive flows. The flows are normalized by dividing by the total cross border flows for that quarter.
3. Remaining Asia is Asia excluding the group of East Asian countries.

Table 7: Correlation in Real GDP Growth During Crisis and Non-Crisis Years

	Hong Kong	Korea	Singapore	Taiwan	Thailand	Indonesia	Mexico	Venezuela
Hong Kong		-0.397	0.106	0.920	0.267	0.406	0.653	-0.312
		(0.43)	(0.314)	(0.792)	(0.410)	(-0.268)	(0.362)	(-0.258)
Singapore	0.927	NA		0.908	NA	NA	NA	-0.487
	(0.314)	(0.62)		(-0.107)	(0.790)	(0.649)	(0.217)	(0.140)
Taiwan	0.382	0.071	-0.006		-0.068	-0.398	-0.028	-0.501
	(0.792)	(0.40)	(-0.107)		(0.178)	(-0.604)	(-0.160)	(-0.411)
Thailand	-0.035	0.983	0.302	0.689		0.926	-0.304	-0.996
	(0.410)	(0.83)	(0.790)	(0.178)		(0.554)	(-0.052)	(-0.124)
Indonesia	-0.323	0.287	0.452	-0.432	0.579		-0.257	-0.825
	(-0.268)	(0.27)	(0.649)	(-0.604)	(0.554)		(0.143)	(0.182)
Mexico	0.359	-0.597	0.035	-0.212	0.038	-0.342		-0.843
	(0.362)	(-0.05)	(0.217)	(-0.160)	(-0.052)	(0.143)		(-0.144)
Venezuela	-0.381	-0.700	-0.652	-0.189	-0.542	-0.537	-0.637	
	(-0.258)	(-0.12)	(0.140)	(-0.411)	(-0.124)	(0.182)	(-0.144)	

Source: Bank for International Settlements

Notes:

1. Numbers not in parentheses refer to correlations in crisis years. Numbers in parentheses refer to correlations in all years.
2. For crisis years, we exclude observations where both countries had above-average real GDP growth rates.
3. NA indicates there were too few observations to calculate correlations.