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Was China the First Domino? Revisiting Asian Currency Crisis

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ABSTRACT

Link of baht devaluation to crisis identifies Thailand as the first domino in the Asian crisis. Others assign responsibility to 1994 Chinese devaluation. Establishing first domino needs further academic scrutiny. We find Chinese devaluation presaging the crisis through export slow-down from her Asian partners.

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Introduction

Currency crises transcend victims' national boundaries and pose major obstacle to smooth economic growth. It is quite possible that an autopsy might reveal a close link between action(s) taken in an economy and the onset of the crisis. Identifying the 'triggerman', known as the first domino can be intriguing. The Tequila crisis saw Mexico clearly as the first domino. Admittedly, the 1997 Asian crisis was set off with the abandonment of the baht/US dollar peg. This apparent 'coincidence' has been advanced as an argument to portray Thailand as the first domino. Krugman (1998) concludes that competition from China was responsible for the slowdown of export growth in the region, and even may have set the ground for her Asian trading neighbors to the slide into the eventual crisis. As we approach a decade of that crisis, the debate over who was the first domino continues.

Krugman's point merits scrutiny. China reaped significant exports advantage against her Asian neighbors after the devaluation (1/1/1994), something corroborated by Radelet and Sachs (1998). Bergsten (1997) and Balla (1998) show that the Chinese devaluation was a major factor leading to the East Asian currency devaluations three years later. By contrast, Fernald et al (1999) argue that the Chinese devaluation was not economically important. So, they argue, China was not the first domino.

The failure of the prevailing literature to produce conclusive evidence points to the need for additional empirical research in the area. This research contributes by providing further evidence to the Asian crisis and thus fills an important gap in knowledge. The findings should help policymakers better understand currency crises. We find statistically significant results suggesting that export competition with China in a third market makes the crisis more severe

among the sample countries.

Section II outlines the empirical methodology and data sources. Section III presents the main results. Section IV offers conclusion.

II. Methodology

Following the Glick and Rose (1999) methodology, we empirically test whether the 1994 Chinese devaluation contributed to slow-down in export growth of her East Asian trading partners that ultimately pushed them into the crisis. The benchmark regression is:

$$Crisis_j = \alpha_0 + \sum \beta_i Trade_{ij} + \sum \delta_i Macro - controls_{ij} + \varepsilon_j \quad (1)$$

Where, $Crisis_j$ is a continuous measure of exchange market pressure calculated as the weighted average of the percentage depreciation of nominal exchange rate against US dollar and the percentage decline in foreign reserves for six months following the start of the crisis.[1] The weights are chosen to equalize the volatility of the components. We calculate the inverse of the variances for each variable with three years of monthly data prior to each crisis. The weight of each variable is the inverse of the variance over the sum of the inverses of the variances.[2]

We calculate $TMEC_j$(Third Market Export Competition) index as follows:

$$TMEC_j(share) \equiv \sum_r \left\{ \left[\left(x_{0r} + x_{jr} \right) / \left(x_0 + x_j \right) \right] \bullet \left[1 - \left| \left(x_{jr} / x_j - x_{0r} / x_0 \right) \right| / \left(x_{jr} / x_j + x_{0r} / x_0 \right) \right] \right\} \quad (2)$$

Where, 0 represents ground zero country (first victim) and r a common third market in which both ground zero and country j compete for exports. x_{jr} refers to country j's export to a third market r. x_j denotes export from country j to world export market. The first component of the

[1] Changes at 6/30/1997.

[2] Indices by Sachs, Tornell and Velasco (1996), Tornell (1999), Eichengreen, Rose and Wyplosz (1996) are calculated similarly.

equation measures overall importance of a third market to country j and 0. The second component captures the extent to which country j and the first victim compete for trade share in a third market. We divide the World export market into five separate regions: Africa and Middle East, Latin America, U.S. and Canada, Europe, and Asia and Oceania, and calculate export competition of country j with the first victim in each of the five markets. The *TMEC* index for any country is the sum of *TMEC* for all five markets.

Using the absolute value of exports to a third market (not share) we calculate a variant measure of third market trade competition.

$$TMEC(absolute) \equiv \sum_r \left\{ \left[\left(x_{0r} + x_{jr} \right) / \left(x_0 + x_j \right) \right] \bullet \left[1 - \left| \left(x_{jr} - x_{0r} \right) \right| / \left(x_{jr} + x_{0r} \right) \right] \right\} \quad (3)$$

Cross-sectional trade data are taken from *Direction of Trade Statistics*.[3] We use 1993 trade data to find trade links between China and our sample countries. China devaluated on January 1, 1994. So, the choice of 1993 data appears reasonable to assess trade links with China and also to estimate competitive pressure on other countries.

Several macro-economic and financial variables can explain the contagious nature of a crisis. Countries with macro-economic and financial imbalances invite speculative attacks. The control variables are: *lending boom, real exchange rate appreciation, current account balance as a percentage of GDP, the government budget as a percentage of GDP, and the level of M2 over international reserve.* They are chosen for their empirical relevance to currency crises.[4] Our aim is to assess whether trade variables can explain contagion above and beyond the affects of these control variables.

The data relate to two cross-sections for 25 emerging markets: Argentina, Brazil, Mexico, Chile, Colombia, Peru, Venezuela, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Sri

[3] Taiwanese Trade data from Monthly Statistics for Exports and Imports, Taiwan Area, Ministry of Finance.
[4] Kaminsky, Lizondo and Reinhart (1998), surveys 28 papers.

Lanka, Thailand, Jordan, South Africa, Turkey, Zimbabwe, Poland, Czech Republic, Hungary, Singapore, China, and Taiwan. We use 1994 macro data for the Mexican crisis and 1996 data for the Asian crisis.

III. Results

Table-1 presents export growth of selected Asian countries. As China's export growth flourished during 1994-1996 in the crucial Asian regions, Oceania, USA and Canadian markets, many Asian economies (Asia-5) experienced the opposite.

Interestingly, after the Chinese devaluation, her imports from every market collapsed, import growth for most of the Asia-5 countries accelerated (Table-2). As Chinese trade surpluses ballooned, trade deficits for Asia-5 countries nose dived (Table-3). Thai export growth collapsed following Chinese devaluation. It was a classic case of beggar-thy-neighbor policy in which trade surplus accrues not only through large gains in exports, but also through contraction in imports. Therefore, we argue: Chinese devaluation affected its neighbors, especially Thailand.

Table-4 ranks trade competitors of China in our sample. Higher rank means greater competition with China in a third country export markets. All top seven countries experienced currency crisis in 1997-98. Regression results for Equation 1 (Table-5) suggest that China was the first domino. *TMEC* is significant at the 1% level and has a positive effect on crisis index. Trade links with China increased the severity of a currency crisis.

When China is considered ground zero, our results suggest that trade competition (with China) worsens crisis. To test whether the choice of ground zero matters in linking trade variable to crisis propagation, we choose Czech Republic as a "dummy" country which does not have substantial trade link in terms of competition for exports in a third market with the crisis hit Asian countries. Equation 2 (Table-5) tests the significance of *TMEC* with Czech Republic as a

ground zero country. The statistically insignificant *TMEC* (and even wrong sign) suggests that the choice of ground zero country matters.

We test the robustness of our benchmark cases by using different sets of macro control variables, by applying different measures of the dependent variable, and by using different variants as measures of trade variable. China is the first domino in the Asian crisis, passed these different sensitivity tests.

IV. Conclusion

Evidence presented here suggests that China was the first domino in the Asian crisis. China's exports grew fast, so did the trade balance as imports shrunk after the 1994 devaluation, and her export competitors faced the opposite outcome. Beggar-thy-neighbor policies made them vulnerable to shocks. Thai export growth nearly collapsed after the devaluation establishing her as the first domino. Identifying Thailand as the first domino masks the search for the real cause. Using China as a ground zero country within the Glick-Rose (1999) model, we find that devaluation made crisis worse due to export competition in a third market.

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Table-1: Export growth: Asian countries in regions 1)US/Canada 2)Europe 3)Asia/Oceania[a]

Country	Regions (1,2,3)	Export			Growth	
China	1990	1993	1994	1996	90-93	94-96
	15.7	18.2	22.8	28.3	6.42	9.38
	9.3	16.5	19.8	24.4	24.9	9.07
	43.3	50.7	71.8	89.2	6.85	9.42
Indonesia						
	3.5	5.5	6.5	7.2	19.62	4.44
	3.3	5.8	6.8	8.4	24.49	9.17
	17.8	23.2	23.5	31.4	11.5	12.58
Korea						
	21.2	19.5	21.9	22.9	-3.63	1.93
	10.9	11.7	12.9	19.1	3.07	17.04
	25.2	39	45.8	67.1	18.96	16.58
Malaysia						
	5.2	10	13	14.8	17.31	5.63
	4.9	7.3	8.9	11.4	18.32	10.75
	18.1	27.6	34.1	48.6	14.80	15.38
Philippines						
	3.2	4.5	5.4	7.2	14.61	12.49
	1.5	2.1	2.4	3.7	13.18	18.79
	3.1	4.2	5.2	9.1	18.90	24.30
Thailand						
	5.5	8.5	10.1	10.6	18.90	2.98
	5.8	8.7	8.3	10	17.60	8.01
	9.4	17.4	23.9	30.8	26.74	11.01

[a] Source: IMF:*Direction of Trade Statistics*

Table-2: Import Growth: Asian countries in regions: 1) US/Canada 2) Europe 3) Asia/Oceania[a]

Country	Regions (1,2,3)	Export			Growth	
China	1990	1993	1994	1996	90-93	94-96
	8.1	12	15.8	18.7	17.06	7.32
	13	24.1	25.5	27.8	26.81	3.75
	29.7	61.7	67.9	81.7	31.75	8.03
Indonesia						
	2.9	3.7	3.9	5	10.58	10.79
	5	7.3	6.8	10.6	16.43	19.27
	12.2	15.5	18.3	24.6	10.40	12.84
Korea						
	18.4	19.6	23.6	36	2.74	18.33
	9.9	13	16.5	25.6	11.83	19.07
	29.4	38	46.1	63.6	11.14	13.97
Malaysia						
	5.2	7.9	10.1	12.6	18.16	9.60
	5.2	6.6	10.3	13.3	10.35	11.10
	17.6	29.7	37.4	49	22.72	11.73
Philippines						
	2.7	3.6	4.3	6.5	12.49	17.94
	1.7	2.3	3	4.6	13.13	18.56
	6.6	9.7	13	17.4	16.72	12.66
Thailand						
	4	5.7	6.8	9.8	15.38	15.87
	6.4	9.5	10.4	13.2	17.15	10.35
	20.1	27.3	33.3	42.7	13.29	10.79

[a] Source:IMF:*Direction of Trade Statistics*

Table-3: Trade Balance (%*GDP*) [a]

Country	1993	1994	19995	1996
China	-1.92	1.39	1.68	2.10
Indonesia	1.48	.72	-.76	-1.14
Malaysia	-.11	-1.59	-3.75	.58
Korea	.06	-1.22	-1.63	-4.36
Philippines	-8.53	-8.95	-8.80	-9.44
Thailand	-4.56	-5.18	-7.09	-6.65

[a] Source: IMF:*IFS*

Table-4: Third Market Trade Competition with China

Rank	Country
1	Malaysia
2	Singapore
3	Indonesia
4	Thailand
5	Korea
6	Philippines
7	Taiwan
8	India

Table-5: Coefficients and |t| statistics: OLS estimates[a]
Dependent variable: *Crisis index*: six-months horizon

Asian Crisis 1997-1998.		
Variable	Eq. 1	Eq. 2
Constant	-11.287 (3.474)**	10.523 (2.074)**
Lending Boom	-.016 (1.513)	.018 (1.264)
Real Appreciation	.717 (2.865)**	.598 (1.30)
Current Account	-.528 (2.0)*	-1.153 (3.313)**
M2/Reserve	-.113 (1.448)	-.038 (.637)
Budget	-.063 (.121)	.858 (1.693)
TMEC	.332 (4.604)**	-9.955 (1.024)
R^2	.504	.249

[a] Heteroskedasticity consistent t-statistics in parentheses
* Significance at 10% level
** Significance at 5% level or better

Figure-1: Asian CurrencyCrisis Index