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Solving the Current Account Puzzle: Capital Flows and the contagion effect of financial crises.

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Abstract

This paper is a follow up on an earlier study "Financial Crises, Panic and Contagion" (Balit Moussalli, 2007).The study was done under two time frames that enabled the analysis of the Russian and Brazilian crises in addition to the Asian crisis. The research however ended with a puzzling result: The change in sign of the Current Account variable from positive in time frame 1 (Asian crisis), to negative in time frame 2 (Russian and Brazilian crises). After an analysis of the main differences that occurred in Eastern Europe and Latin America between the two time periods, this study finds that the capital account is a key factor in solving the current account puzzle. In addition, this study provides evidence of the contagious effect of the Asian crisis on what will later be known as the Russian crisis, and the Brazilian crisis.

Introduction

Many studies have been written on the importance of institutions in general to world economic and financial development (Choi, 2002;Chowdhury,1999; La Porta, Lopez-de-Silanes, Shieffer & Vishner,1998; Rajan, & Zingales, 2003; Rodrik,1999; Shackman , 2003; Woo, 2000a). One study in particular (Balit Moussalli, 2007), focused on two main institutional variables (rule of law and corruption), in addition to exchange rates and capital controls, and examined their effects on financial crisis as measured by two variables Depreciation and Stock Market prices. The study concluded that loss of confidence and panic, tend to increase the severity of a crisis. In addition, the study focused on the Asian crisis under two time frames, which enabled the analysis of the Russian and Brazilian crises in addition to the Asian crisis, and led to a puzzling result from the regressions: The change in sign of the Current Account from positive in time frame 1, to negative in time frame 2 for the two measures of the crises.

This study analyses the main differences that occurred in Eastern Europe and Latin America between the two time periods, and finds that the capital account is a key factor in solving the current account puzzle. In addition, the analysis of the capital account variable under both time frames provides evidence of the contagious effect of the Asian crisis on what will later be known as the Russian crisis, and the Brazilian crisis. The following sections start with a literature review followed by an explanation of the current account puzzle. Then the paper focuses on the changes in Eastern Europe and Latin America, leading to the theory behind the capital account being the solution to the puzzle. This is followed by a methodology leading to the conclusion.

Literature Review

Studies on the Asian crisis and contagion, such as Aggarval (1999), show that the Asian crisis was primarily caused by two factors. First, the crisis was caused by those nations' weakening international competitive positions as a result of the 1994 Chinese devaluation and the 1990s recession in Japan. Second, their poorly developed domestic financial systems, and the resulting lack of transparency accentuated the problems. Aggarval found that the key determinant of Asian recovery was the reform of domestic financial systems to deal with low disclosure levels, high debt ratios, positive feedback circles, and high political influence in credit decisions.

Caramazza, Ricci, and Salgado (2004) used panel probit regressions on 41 emerging countries to examine the role of financial linkages in the propagation of emerging market crises during the 1990s. After controlling for the role of domestic and external fundamentals, trade spillovers, and financial weaknesses, they found that financial linkages played a significant role in the spread of the Mexican, Asian, and Russian crises.

A study by Fratzscher (2003) used a nonlinear Markov-switching model to evaluate three causes of currency crises: contagion, weak economic fundamentals, and unobservable shifts in agents' beliefs. This study concluded that contagion, or the high degree of real integration and financial interdependence among

countries, are crucial not only in explaining past crises, but also in predicting the transmission of future financial crises.

A study by Cartapanis, Dropsy, and Mametz (2002) looked at the importance of macroeconomic unsustainability, financial vulnerability and crisis contagion in explaining the Asian crisis. Using out of sample forecasts based on 2-stage panel and logit regressions, they provided evidence that a pure contagion effect significantly worsened the crises. Only Indonesia was in an unsustainable economic situation, while the other nations were only vulnerable to a currency crisis.

Looking at data from 32 nations in three different regions of the world (Asia, Eastern Europe, and Latin America), the study by Balit Moussalli (2007) focused on two main institutional variables (rule of law and corruption) and their effect on reducing panic and thus the severity of the Asian crisis. The study also examined the importance of the choice of an exchange rate regime on the severity of the crisis, especially when institutions are lacking. In addition, it looked at the interaction between three variables (institutions, capital controls, and exchange rates) and their effect on the severity of the crisis (as measured by depreciation and changes in stock prices) using two different time frames. Those variables were found to be important in explaining not only the severity of the Asian crisis (time frame 1: Asian crisis), but also the severity of financial crises in general (time frame 2: Asian, Russian & Brazilian crises).

Balit Moussalli's main conclusion was that the lack of institutions, when combined with capital liberalization and a fixed exchange rate system, can lead to a loss of confidence and panic. This loss of confidence and panic tend to increase the severity of financial crises. But studying the Asian crisis under the two time frames led to a puzzling result: For the two measures of the crises (depreciation and changes in stock prices), the Current Account coefficient sign changed from positive in time frame 1, to negative in time frame 2. The next section focuses on explaining this result.

Table 1
Dependant Variables

Dependant Variables	Description	Sources
Depreciation	% currency depreciation	OANDA.com: FX History
Stock prices	% decrease in stock market prices	Morgan Stanley and WSEF

Table 2
Control Variables: Macroeconomic Variables
Deficits, Money Growth, Current Accounts, Reserve Adequacy, Debt

Control Variables	Description	Sources*
Deficits	Budget deficits as a % of GDP	The ICRG Taiwanese data from the Central Bank of China (www.cbc.gov.tw)
Money Growth	% of Money growth per year.	IMF *International Financial Statistics Yearbook*, line 351
Current Accounts	Current Accounts as % of GDP	The ICRG. Laos data was available from the IMF *International Financial Statistics Yearbook*
Reserve Adequacy	The ratio of M2 (money +quasi money) divided by reserves	IMF *International Financial Statistics Yearbook*, line 351 divided by line 1lid
Debt	Foreign debt as a % of GDP	The *ICRG*

*Taiwanese data was available from the Central Bank of China (www.cbc.tw)

Explaining the Current Account Puzzle

Several regressions were run on the two different dependant variables measured, Depreciation, and Stock Prices, using different independent variables each time; institutional variables, capital controls, exchange rate regimes, ITV1 and ITV2, with the same macroeconomic control variables; deficits, money growth, current accounts, reserve adequacy, and debt. Those regressions were repeated under two different time frames (Balit Moussalli, 2007). Since those same variables will be part of the methodology described below, a description and source of all the variables is provided in Tables 1, 2 and 3. The differences between the two time frames are summarized in Tables 4 and 5.

The hypothesis predicted that the relationship between the current account and the severity of crises should be positive. This is consistent with economic theory. A current account deficit (imports greater than exports) should lead to a decrease in the value of a currency, and a decrease in stock prices. While all the regressions under time frame 1 confirmed the hypothesis predictions, all the regressions under time frame 2 showed a negative relationship between current accounts and the severity of crises. This result was puzzling.

Table 3
Independent Variables
Institutional Variables: Corruption and Law & Order
Other Variables: Capital controls, exchange rate regimes, regions, ITV1&ITV2

Independent Variables:	Description	Sources:
Corruption	Measured on a scale of 0-6. Low numbers indicate weak institutions	The *ICRG*
Law & Order	Measured on a scale of 0-6. Low numbers indicate weak institutions	The *ICRG*
Capital Controls	Measured on a scale of 0-10. Low numbers indicate less capital control	Cato Institute's *Report on Economic Freedom of the World*
Fixed exchange rate dummy	Dummy variable, where "1" is assigned to flexible exchange rates, "0" to fixed exchange rates	IMF *International Financial Statistics Yearbook*
Asia dummy variable	"1" is assigned to Asian countries and "0" to all the others	
ITV1	Capital controls divided by (corruption + Law and order)	
ITV2	1/(capital controls + law and order + corruption) and "0" for countries with fixed exchange rates	

Table 4
Dependant Variables Time Frame Differences

Dependant Variables	Time Frame 1: *The Asian Crisis*	Time Frame 2: *The Asian, Russian, and Brazilian Crises*
Depreciation	June 1997- Jan 1998 For all countries	June 1997-Jan 1998 for Asian countries July 1998-Feb 1999 for Eastern European countries Nov.1998-May1999 for Latin American countries
Stock Prices	June 1997-Jan 1998 For all countries	June 1997-Jan 1998 for Asian countries July 1998-Feb 1999 for Eastern European countrie Nov.1998-May1999 for Latin American countries

In order to analyze the current account puzzle, the next section will look closely at the main changes that occurred in the second time period in Eastern Europe and Latin America. This will lead into a discussion of the Capital Account as the main possible explanation to the puzzle. After providing a solution to the current account puzzle, the rest of the study examines the differences in time frames as related to the new capital

account variable added, which leads to a major finding: the contagion effect of the Asian crisis.

Table 5

Independent Variables Time Frame Differences

Independent Variables	Time Frame 1: *The Asian Crisis*	Time Frame 2: *The Asian, Russian, and Brazilian Crises*
Macroeconomic variables	1996 for all countries	1996 for Asian countries 1997 for Eastern European countries 1998 for Latin American countries
Institutional Variables	1996 for all countries	1996 for Asian countries 1997 for Eastern European countries 1998 for Latin American countries
Capital Controls	1995 for all countries	2000 for all countries
Exchange Rate Regime	IMF specification as of June of 1995	IMF specification as of March of 1998

Changes in Eastern Europe and Latin America

The second time period involves the years in which the Russian crisis and the Brazilian crisis occurred, in addition to the Asia crisis years described in time period 1. Thus, a closer look at what exactly changed in Eastern Europe and Latin America between the two time periods might help in clarifying the reason behind the current account reversal in sign. Looking first at the mean statistics for the entire sample, it is clear from Table 6 that the dependant variable that changed the most is the capital flow variable. The sample average percentage change in capital flows reversed from a positive 8.13% (ie. an inflow) to a negative 92.45% (an outflow), a 1235 % decrease in capital flows.

Table 6

Mean Statistics For the Entire Sample

	TIME FRAME 1		TIME FRAME 2		Mean % Change
	Mean	SD	Mean	SD	
Depreciation	-25.34	58.08	-36.04	73.84	-42.8
Stock prices	-39.52	25.45	-29.39	29.7	25.6
Capital Flows	8.13	130.96	-92.45	192.6	-1237
Deficits	-0.75	3.81	-1.15	3.93	-53.3
Money Growth	23.8	15.24	21.9	17.87	-7.9
Current Account	-2.5	5.34	-3.47	4.72	-2.5
Reserve Adequacy	4.4	2.68	4.6	2.63	4.5
Debt	32.8	22.11	33.5	20.14	2.1
Law & Order	4.46	1.04	4.46	1.04	0
Corruption	3.5	0.87	3.3	1.06	-5.7
Capital Controls	4.06	2.7	4.25	2.27	4.6
Fixed exchange rate dummy*	9		9		0

*Number of countries with flexible exchange rates

Looking closely at Eastern Europe (Table 7) shows a 133.6% decrease in capital flows between the two time periods for the region, mainly for Russia, with a reversal in capital flows from a positive 70.45 to a -157.8, a decrease of 323.9 %.. This result is expected because of the Russian crisis, which also affected some of its neighbors, such as Slovenia, Romania, and UkraineThe Eastern European region as a whole experienced a worsening current account deficit of 11.8 % from period 1 to period 2. Russia, in particular, had a current account surplus of 2.8 in time period 1 that went down to 0.5 in time period 2. The surprisingly healthy current account surplus did not help the country because of the accelerating amounts of capital outflows. The mean statistics comparison between the two periods for the region shows a 11.8% deterioration in the current account deficit, a 422.3% worsening of depreciation, and finally a 133.6% reversal in capital flows from a 46% inflows to a 15% outflows. The reversal in sign of the current account coefficient for the sample as a whole might be explained by the one significant change that happened, in term of the reversal in capital flows between time period 1 and time period 2 in Eastern Europe.

Table 7
Mean Statistics for Eastern Europe and Russia

	MEAN EASTERN EUROPE			RUSSIA		
	Time Frame 1	Time Frame 2	% Change	Time Frame 1	Time Frame 2	% Change
Depreciation	-8.18	-42.73	-422.3	-4.76	-273	-5635.2
Stock prices	-40.26	-17.18	57.3	-42.53	-75.67	-77.9
Capital Flows	46.28	-15.56	-133.6	70.45	-157.8	-323.9
Deficits	-2.77	-2.26	-18.4	-6.9	-6.1	11.5
Money Growth	28.67	14.32	-50	29.6	28	-5.4
Current Account	-4.29	-4.8	-11.8	2.8	0.5	-82.14
Reserve Adequacy	3.43	3.38	-1.45	2.2	2.2	0
Debt	25.53	27.79	8.85	29.9	38	27.09
Law & Order	4.7	4.7	0	4	4	0
Corruption	3.9	3.7	-5.1	3	2	-33.3
Capital Controls	4.57	4.44	-2.8	6.45	7.15	10.8
Fixed exchange rate dummy*	2	0		0	0	

*Number of countries with flexible exchange rates

Looking closely at Latin America (Table 8), there was a reversal in sign from a positive 89.2 to a -160.82, a 280.29 % decrease in capital flows, showing that the inflows of capital in time 1 turned into an outflow in time 2. However, there was also an improvement in depreciation from -8.26 to -7.8 of 5.56%, as well as an improvement of 29.34 % in the percentage change in stock prices from -20.38 to -14.4. Brazil, however, experienced a worsening in all three measures between the two time periods, as might be expected since this reflects the time frame of the Brazilian crisis.

The Latin American region shows a worsening of 130% in the current account deficit between the two time periods, while Brazil shows a deterioration of 43.3 %. The mean statistical comparison for the region between the two time periods shows a130% deterioration in current account deficits, a 5.56% improvement in depreciation, and finally a 280% reversal from capital inflows to capital outflows. Again, the reversal in sign of the current account coefficient for the sample as a whole might be explained by the one significant change that happened in terms of the reversal in capital flows between time period 1 and time period 2 in Latin America.

Table 8
Mean Statistics for Latin America and Brazil

	MEAN LATIN AMERICA			BRAZIL		
	Time Frame 1	Time Frame 2	% Change	Time Frame 1	Time Frame 2	% Change
Depreciation	-8.26	-7.8	5.56	-4.9	-4.5	-1018.4
Stock prices	-20.38	-14.4	29.34	-29	-42.1	-45.2
Capital Flows	89.2	-160.82	-280.29	-29.7	-50.7	-21.21
Deficits	-0.98	-2.73	-17.8	-5.9	-7.9	-33.8
Money Growth	26.69	34.97	31	12.2	10	-18
Current Account	-1.99	-4.58	-130	-3	-4.3	-43
Reserve Adequacy	3.43	3.97	15.7	4.3	4.73	10
Debt	41.1	39.1	-4.8	22.4	30.5	36.1
Law and Order	3.5	3.5	0	3	3	0
Corruption	2.9	2.6	-10.34	3	3	0
Capital Controls	3.12	3.96	26.9	10	9.2	-8
Fixed exchange rate dummy*	4	4		0	0	

*Number of countries with flexible exchange rates

The Theory behind the Capital Account Explanation

The statistics shown above point to a remarkable change in capital flows among all three regions between the two time periods, which indicate that the capital account might be the key to the puzzle.

Thus, the following theory is proposed as an explanation to the puzzle: In a hypothetical situation where countries face current account surpluses, there should be an appreciation of the currency in the long run, since the increase in exports over imports lead to an increase in the demand for the currency, and thus an appreciation of the currency. This explanation however, does not take into account the effect of the capital account on the currency. If the capital account balance is greater than the current account balance, the surplus in the current account might be counter balanced by a deficit in the capital account, due to a greater outflow of capital. This would then lead to a decrease in the demand for the currency, and thus a depreciation rather than an appreciation of the currency.

In this particular case, the capital account acts as an intervening variable and distorts the relationship between the current account and depreciation. Thus, although it looks as if the current account surplus might lead to a depreciation of the currency and a negative coefficient, this only occurs because of the negative effect of a greater capital account deficit on the relationship. Also, a current account deficit might seem to lead to an appreciation of the currency and a negative relationship, because of the intervening effect of a greater surplus in the capital account. So the negative sign of the current account coefficient is only a reflection of the effect of the capital account. The positive relationship between the current account and depreciation holds only when other things are constant, especially the capital account, in this particular case.

The negative coefficient between current accounts and percentage changes in the stock prices can be explained following the same logic. If the current account surplus, because of greater capital outflows, leads to a depreciation of the currency this will decrease the demand for stocks, thus will decrease stock prices. In

other words, under time frame 2, the relationship between the current account and the severity of the crisis might have been affected by an intervening variable: the volume of capital outflows. As explained above, the mean statistics for % change in capital flows indicates a big reversal between time frame 1 and time frame 2, from an average of +8.13 (capital inflows) under time frame 1 to a complete reversal of -92.45 (capital outflows) under time frame 2.

Solving the Puzzle: Methodology

The above discussion leads to the conclusion that adding a capital account control variable might provide the explanation to the conflicting results between the two time frames. A capital account variable can be derived by calculating the capital and financial flows as a percentage of GDP for the years before the crises (table 11).

Again, using the same methodology as in the previous study (Balit Moussalli, 2007), but with the addition of the new capital account variable, OLS regressions are used including all the macroeconomic variables, for both dependant variables, under both time frames (variables described in tables 1,2,3,4 and 5). The bootstrap method is also used in order to address the issue of small sample size without having to deal with OLS regression assumptions such as homoscedasticity, normality, and independence of the error terms. This method will be used to check for the robustness of the standard errors of the regression coefficients.

Table 9

The Effect of the Capital Account on Depreciation: Comparison between Time 1 and Time 2

	TIME FRAME 1		TIME FRAME 2	
Independent variables	OLS Standard Errors	Bootstrap Standard Errors	OLS Standard Errors	Bootstrap Standard Errors
Debt	-0.84 (0.60)	-0.84** (0.63)	-1.64 (1.03)	-1.64 (1.54)
Current Account	3.40 (4.8)	3.40 (4.42)	1.08 (4.95)	1.08 (6.04)
Money Growth	-0.78 (0.75)	-0.78** (0.88)	-1.04 (0.78)	-1.04 (1.86)
Reserve Adequacy	-7.5 (5.40)	-7.5 (6.83)	2.04 (6.13)	2.04 (7.92)
Deficit	-1.38 (3.48)	-1.38 (3.36)	2.78 (4.00)	2.78 (4.58)
Asia Dummy Variable	-56.90 (35.48)	-56.90** (31.88)	-37.67 (37.12)	-37.67 (42.00)
Capital Account	0.024 (4.88)	0.024 (3.85)	7.12* (4.34)	7.12* (4.38)
Constant	74.64 (37.80)	74.64 (53.70)	28.06 (56.67)	28.06 (93.39)
Adjusted R2	0.233*	0.233*	0.164	0.164

*Significant at 10%; **Significant at 5%; ***Significant at 1%.

To check for multicollinearity, the VIF test was used Usually, VIF numbers less than 20, or a tolerance of 0.05 or more, indicates no significant multicollinearity problem. The highest VIF numbers on those variables went only up to 2.5, a very good indication that there are no highly correlated variables in the study. The Cook-Weisberg test results indicated that stock prices in both time periods showed no heteroscedasticity problems at all, with p-values much greater than 0.1. However, depreciation in time frame 1 had some heteroscedasticity problems. When the White test was used, the p-values were above 0.1 for most of the independent variables used, indicating no major problem.
The results are reported in Tables 9 & 10.

Focusing on time frame 2, when the capital account is added, one out of the two measures of the crises indicate that the current account does actually change signs and turns positive. The reversal in signs gives evidence that, when controlling for the effect of the capital account, the current account has a positive relationship with depreciation as predicted by economic theory. We can now conclude that the answer to the puzzle does indeed lie in the capital account effect on the crises. The capital account also has a positive coefficient as predicted in the discussion earlier. A positive balance (inflows greater than outflows) indicates an increase in the demand for the currency, thus it leads to appreciation. A negative balance (outflows greater than inflows) indicates a decrease in the demand for the currency, thus depreciation.

Table 10
The Effect of the Capital Account on Stock Prices: Comparison between Time 1 and Time 2

	TIME FRAME 1		TIME FRAME 2	
Independent variables	OLS Standard Errors	Bootstrap Standard Errors	OLS Standard Errors	Bootstrap Standard Errors
Debt	0.15 (0.27)	0.15 (0.33)	-1.27** (0.3)	-1.27*** (0.37)
Current Account	2.11 (2.06)	2.11 (2.77)	-2.95** (1.37)	-2.95* (1.92)
Money Growth	-0.66 (0.32)	-0.66 (0.43)	-0.34 (0.21)	-0.34 (0.31)
Reserve Adequacy	3.19 (2.24)	3.19 (3.01)	-1.06 (1.72)	-1.06 (2.06)
Deficit	-0.27 (1.44)	-0.27 (2.27)	2.26 (1.10)	2.26 (1.79)
Asia Dummy Variable	-40.68*** (11.13)	-40.68*** (14.85)	-45.58*** (10.12)	-45.58*** (14.84)
Capital Account	0.42 (2.11)	0.42 (3.06)	-0.87 (1.24)	-0.87 (1.71)
Constant	-24.53 (15.93)	-24.53 (22.61)	33.62 (16.23)	33.62 (18.49)
Adjusted R2	0.30**	0.30**	0.60***	0.60***

*Significant at 10%; **Significant at 5%; ***Significant at 1%.

While previously the current account variable was not found to be statistically significant in explaining any of the two measures of the crises in time frame 2, when the capital account control variable is added, the statistical significance changes too. It is the capital account that is found to be a lot more significant than the current account. The capital account is 90% significant in explaining depreciation even with the bootstrap method, while the current account is not.

Economic versus Statistical Significance

Similar to the previous study written (Balit Moussalli, 2007), the analysis of results is not limited only to statistical significance, but also takes into account the economic significance of variables as indicated by the size of the coefficients. The size of the coefficient of the capital account variable, when compared to the size of the current account is another indication of its economic importance in explaining financial crises. The capital account coefficient is 7.12, while the current account coefficient is about 1 in predicting depreciation. This means that a 1% change in the capital account leads to about 7% change in depreciation, while a 1% change in the current account leads to only about 1% change. The explanation lies in the immediate effect of the capital account on currency depreciation, while the effect of the current account is more long term in nature.

The importance of the capital account variable is obvious from the above discussion. The variable was a clue in solving the current account puzzle in time frame 2, and in predicting the severity of the crises. How important is the capital account variable in predicting the spread (contagion effect) of financial crises? How do the results compare under both time frames? This leads us to the next part of this paper, which takes into account the additional variable, and its effect on the two measures of the crises in the two time frames involved.

Comparison Between the Two Time Frames With the New Variable

Table 9 shows the effect of the capital account on depreciation in the two time frames. While the variable does not reach statistical nor economic significance in time frame 1, it is both statistically significant at the 10% level in time frame 2. In addition, the size of the coefficient in time frame 2 indicates its economic significance. While the coefficient for the capital account is 0.024 in time frame 1, it increases to 7.12 in time frame 2. This means that a 1% change in the capital account, changes depreciation by about 7% in time frame 2, as opposed to only 0.02 in time frame 1.The debt variable on the other hand, as well as the Asia dummy variable is more statistically significant in time frame 1 than in time frame 2.

Table 10 shows the effect of the capital account on stock prices under both time frames. In time frame 1 and time frame 2, the variable fails to reach statistical significance. In addition, the size of the capital account coefficient is 0.428 in time frame 1, and 0.87 in time frame 2, which indicates that the variable is not economically significant in predicting stock prices. On the other hand, both the debt variable and the Asia dummy variable are highly significant at the 1% level.

The Contagion Effect

In order to study the contagion effect of the capital outflows from the Asian crisis on the other countries, as well as the contagion effect of the capital outflows from the Russian crisis, on the other countries, the new variable was measured differently under each time frame. The time frame differences for the new variable are summarized in Table 11.

Under time frame 1, 1996 is used for the capital account variable in order to study the effect of the capital inflows and outflows that occurred before the Asian crisis on all the countries in the sample. Under time frame 2, 1997 (the Asian crises year) was used for Asian countries and 1998 (the Russian crisis year) was used for all the other countries to calculate the capital account variable.

Table 11
The New Variables: Time Frame Differences

Contagion Effect	Time Frame 1 *The Asian Crisis*	Time Frame 2 *The Asian, Russian, and Brazilian Crises*
Capital Account	Capital & Financial Account as a % of GDP in 1996 for all countries (Source: IMF *IFSY*)	Capital Account as a % of GDP in 1997 for Asian Countries Capital Account as a % of GDP in 1998 for all other countries.

The high statistical significance, as well as the size of the coefficients of the capital account in time frame 2 indicates its importance in explaining the crises. However, its low statistical significance and the size of the coefficients in time frame 1 indicate that the variable was not significant in explaining the Asian crisis. Because the capital account has a high explanatory power in time frame 2 but not in time frame 1, we can conclude that the study of time frame 2 shows the contagion effect of the outflow of capital from Asia on the other countries in the sample.

Conclusion

A comparison between the events underlying the two time frames enabled us to find the solution to the current account puzzle. While under time frame 1 the current account had a positive relationship with the severity of the Asian crisis consistent with economic theory, under time frame 2 the sign of the regression coefficient was negative. The descriptive data comparing both time frames suggested that the huge capital outflows in time frame 2 could be the answer to the puzzle. At this time, an additional control variable was added to the study: the capital account.

Adding the capital account variable completely reversed the sign of the current account coefficient from negative to positive, similar to time frame 1 and as predicted by economic theory. That variable provided a solution to the current account puzzle in time frame 2, by showing that the capital account can mediate the effect of the current account on financial crises.

Adding the capital account variable and comparing its effects in time frame 1 and time frame 2, provided evidence showing the contagion effect of the Asian crisis. For the two measures of the crises, depreciation and stock prices, the capital account does not reach statistical nor economic significance in time frame 1. That means that capital flows before the crisis did not play a very important role in explaining the severity of the Asian crisis. This is to be expected, since Asian countries experienced an inflow of capital before the crisis, which under normal circumstances should not lead to a financial crisis.

The results were very different for time frame 2. The capital account variable reaches very high statistical significance at the 1% level, as well as high economic significance when predicting depreciation. This means that the capital account variable measured in the years preceding the Russian and Brazilian crises played a very important role in predicting those crises. In fact, since the year preceding the Russian crisis is the Asian crisis year, and the year preceding the Brazilian crisis is the Russian crisis year, we can say that this result is a very strong indication of the contagion effect of the Asian crisis. Because capital outflows that occurred during the Asian crisis are highly significant both statistically and economically in predicting depreciation in time frame 2, during the Russian and Brazilian crises, we can conclude that this is a strong indication of contagion.

In addition, the bootstrap method used previously (Balit Moussalli, 2007) was repeated again, and confirmed the importance of the capital account in explaining the severity of crises under time frame 2. We can conclude that the results are robust and the bootstrap method confirmed the contagion effect of capital outflows and panic on financial crises in general.

Policy Implications

This study confirms and adds evidence to the earlier one (Balit Moussalli, 2007), showing that panic aggravated financial crises that were due to weak macroeconomic fundamentals The process of developing financial markets and overcoming financial crises is not an easy one. Industrialized nations with now large, stable, and developed financial markets also had to face financial crises in the past. Most of those countries enjoy now strong institutions, open capital markets, and flexible exchange rates. Institutions such as the IMF can guide developing countries in that direction. With time, free market forces will also lead those developing nations to strengthen their legal system, and develop the right institutions that will ensure investors' confidence and thus reduce panic and sudden massive capital outflows. All those variables working together will help countries in the future overcome financial crises and reduce their severity and spread.

Future Research

Including the capital account helped in explaining the current account puzzle and in showing the contagion effect of financial crises. However, the study leads to interesting results as far as stock prices are concerned. First, it is noticed that in time frame 2, when the capital account variable is included, the sign of the current account remains negative in predicting stock prices but is only 10% significant. Why does the

current account remain negative in predicting stock prices in time frame 2, even when the capital account is included while it is positive in time frame 1?

The second interesting result relates to the importance of the capital account in predicting stock prices. Under both time frames, the capital account is neither statistically nor economically significant in predicting stock prices. The regression coefficient for the capital account is 0.428 in time frame 1, and 0.87 in time frame 2. On the other hand, the debt variable is highly significant at the 1% level, as well as the Asia dummy variable, that reaches high statistical significance at the 1% level, even in time frame 2. Why is the capital account variable not significant in predicting stock prices under both time frames?

The capital account does not seem to play an important role in predicting stock prices, but it is very important in predicting depreciation under time frame 2. The contagion effect through the outflow of capital seems to affect more depreciation than stock prices. On the other hand, Stock prices seem to be a lot more affected by the region variable (an indication of panic) and by foreign debt. The value of currencies and stock prices are not always affected by the same variables and in the same way. This is an intriguing question that would benefit from further investigation.

In addition, a deeper study of the effect of depreciation on stock prices might further indicate the effect of panic on financial crises. Looking at the effect of depreciation on stock prices in time frame 1, and comparing it to the effect of depreciation on stock prices in time frame 2, might reinforce the conclusion about the panic effect of financial crises. If depreciation leads to a decrease in stock prices (positive relationship) this could be used as an indication of the beginning of a crisis, as it shows panic and thus the expectation of further deterioration. If depreciation leads to an increase in stock prices (negative relationship), this could be used as an indication of the end of a crisis, as it shows the gain in investors' confidence and thus the expectation of a recovery. This will be the focus of further studies, shedding more light on the variables that help predict the severity and spread of financial crises in the future.

References:

Aggarval, R. (1999a). Causes of the recent Asian economic crises. *Thunderbird International Business Review, 41,* 721-728.

Aggarwal, R. (1999b). Role of financial system reforms in restoring growth in Asia. *Emerging Markets Quarterly, 2,* 15-23.

Asian Development Bank (1998). *Key indicators of developing Asian and Pacific countries, 1998,* Vol. XXIX. Manila: Asian Development Bank.

Balit Moussalli, C. (2007). Financial crises, panic and contagion: Evidence from a cross-country comparison using two time frames. *Journal of Business and Public Affairs,1,* 1-17.

Banz, R. & Clough, S. (2002). Globalization reshaping world's financial markets. *Journal of Financial Planning, 15,* 72-80.

Caramazza, F. Ricci, L., & Salgado, R. (2004). International financial contagion in currency crises. *Journal of International Money and Finance, 23,* 51.

Cartapanis, A., Dropsy, V, & Mametz, S. (2002). The Asian currency crisis: Vulnerability, contagion, or unsustainability. *Review of International Economics, 10,* 79.

Chakraborty, D. (1999). Macroeconomic conditions and opening up-Argentina, Chile and India: A comparative study. *International Journal of Social Economics, 26,* 298.

Choi, S. J. (2002). Law, finance, and path dependence: Developing strong securities markets. *Texas Law Review, 80*, 1657-1727.

Chowdhury, A. (1999). Political economy of macroeconomic management: The need for institutional change. *International Journal of Social Economics, 26,* 389-427.

Corsetti, G. Pesenti, P. & Roubini, N. (1998). Paper tigers? A model of the Asian crisis. *European Economic Review, 43,* 1211-1236.

Cumby, R., & Glen J. (1990). Evaluating the performance of international mutual funds. *The Journal of Finance, 45,* 497-521.

Davis, G., & Kanago, B. (1998). High and uncertain inflation: Results from a new data set. *Journal of Money, Credit, and Banking, 30,* 218-230.

Efron, B. (1979). Bootstrap methods: Another look at the jackknife. *The Annals of Statistics,* 7, 1-26.

Efron, B. (1981). Nonparametric estimates of standard error: The jackknife, the bootstrap and other methods. *Biometrika*, 63, 589-599.

Efron, B. (1982). The jackknife, the bootstrap, and other resampling plans. *Society of Industrial and Applied Mathematics CBMS-NSF Monographs*, 38.

Efron, B., & Tibshirani, R. J. (1993). *An introduction to the bootstrap.* New York: Chapman & Hall.

Eiteman D., Stonehill A., & Moffett M. (2001). *Multinational business finance.*(9 th ed.). New York: Pearson Addison Wesley.

Fan, X., & Wang, L. (1996). Comparability of jackknife and bootstrap results: An investigation for a case of canonical correlation analysis. *Journal of Experimental Education*, 64, 173-189.

Fratzscher, M. (2003). On currency crises and contagion. *International Journal of Finance & Economics, 8,* 109.

Grier, K. B., & Grier, R. M. (2001). Exchange rate regimes and cross-country distribution of the 1997 financial crisis. *Economic Inquiry, 39*, 139-148.

Hartwell, C. A. (2001). The case against capital controls: Financial flows, crises, and the flip side of the free-trade argument. *Cato Policy Analysis, 403,* 20.

Jeong, J., & Maddala, G. S. (1993). A perspective on application of bootstrap method in econometrics. In G.S. Maddala, C. R. Rao & H.D. Vinod (eds.), *Handbook of statistics: Econometrics,*Vol 11 (pp. 573-610). Amsterdam: North-Holland.

Johnson, S., Boone, P., Breach, A., & Friedman, E. (1999). *Corporate governance in the Asian financial crisis.* Unpublished manuscript.

Krugman, P. (1979). A model of balance-of-payments crisis. *Journal of Money, Credit, & Banking, 11,* 311-325.

Krugman P. (1998a). What happened to Asia? Retrieved from http://web.mit.edu/Krugman/www/DISINTER.html

Krugman, P. (1998b). Will Asia bounce back? Retrieved from http://web.mit.edu/Krugman/www/suisse.html

La Porta, R., Lopez-de-Silanes, F., Shieffer R., & Vishner R. (1997). Legal determinants of external finance. *The Journal of Finance, 52,* 1131-1151.

La Porta, R., Lopez-de-Silanes, F., Shieffer R., & Vishner R. (1998). Law and finance. *Journal of Political Economy, 2,* 1113-1156.

Lai, K.S., Lee, D., Loo, J. & Yi, J. (1998). Asian financial crisis shows globalization can promote risks as well as opportunities. *Business Forum, 23,* 5-13.

MacKinnon, J. (2002). Bootstrap inference in econometrics. *Canadian Journal of Economics, 35,* 615-645.

McCloskey, D. & Ziliak, S. (1996). The standard error of regression. *Journal of Economic Literature, March 1996,* 97-114.

McCloskey, D. & Ziliak, S. (2003) Size matters: The standard error of regressions in the American Economic Review. *Forthcoming in the Journal of Socio-Economics.*

Mooney, C. Z. & Duval, R. D. (1993). *Bootstrapping: A nonparametric approach to statistical inference.* Newbury Park, CA: Sage Publications.

Nidhiprabha, B. (1998). Economic crises and the debt-deflation episode in Thailand. *Asian Economic Bulletin, 15*, 309-318.

Park, J. (2002). Globalization of financial markets and the Asian crisis: Some lessons for Third World developing countries. *Journal of Third World Studies, 19*, 141-164.

Pynnonen, S., & J. Vataja. (2002). Bootstrap testing for cointegration of international commodity prices. *Applied Economics, 34,* 637-647.

Rajan, R., & Zingales, L. (2003). The great reversals: The politics of financial development in the 20th Century. *Journal of Financial Economics, 69*, 5-46.

Rochon, L., & Vernengo, M. (2000). Exchange rate regimes and capital controls. *Challenge, 43*, 76-92.

Rodrik, D. (1999). The Asian financial crisis and the virtues of democracy. *Challenge, 42*, 44-60.

Shackman, J. (2003). *The equity premium: A global phenomena?* Unpublished manuscript.

Shackman, J (2004). *The equity premium and market segmentation: Evidence from international data.* Unpublished manuscript.

Tornell, A. (1999). *Common fundamentals in the Tequila and Asian Crises.* Unpublished manuscript.

Tornell, A., & Velasco, A. (1995) *Fixed versus flexible exchange rates: Which provides more fiscal discipline?* Unpublished manuscript.

Wade, R., & Veneroso, F. (1998). The gathering support for capital controls. *Challenge,41*, 14-26.

William, G. C. & Kiser, S. (1999). Why Brazil devalued the real. Retrieved from http: //www.dallasfed.org/eyi/global/9907real.html.

Woo, W. T. (2000a). The Asian financial crisis: Hindsight, insight, foresight. *ASEAN Economic Bulletin, 17*, 113-119.

Woo, W. T. (2000b). Coping with accelerated capital flows from the globalization of financial markets. *ASEAN Economic Bulletin, 17*, 193-204.

Woo, W. T., Carleton, P. D., & Rosario, B. P. (2000). The unorthodox origins of the Asian Currency crisis: Evidence from logit estimation. *ASEAN Economic Bulletin, 17*, 120-134.

Zainal-Abidin, M. (2000). Implications of the Malaysian experience on future international financial arrangements. *ASEAN Economic Bulletin, 17*, 135-147.