

# Currency Crises And Export Behavior Of Foreign Affiliates

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## ABSTRACT

*This paper argues that following a currency crisis, foreign firms may increase their exports and reduce their local sales to mitigate the effect of the crisis. In so doing, foreign firms escape the effect of the crisis on local demand and capitalize on increased competitiveness due to currency devaluation and lower domestic input prices. Using data on sales by US majority owned affiliates in 41 countries spanning over 19 years, we show that US firms redirect their sales from domestic markets to exports. We also find that currency crises have a positive effect on developing countries merchandise exports.*

## INTRODUCTION

**T**his paper argues that following a currency crisis, foreign firms may switch from local sales to exports to mitigate the effect of the crisis on domestic demand. In so doing, they capitalize on increased competitiveness due to devaluation, lower domestic asset prices and lower factor costs. This behavior, switching to exports, explains why foreign firms may survive currency crises, and lends support to the literature that views foreign direct investment (FDI) as a safer mode of financing. This analysis yields valuable policy implications as the increase in exports following a currency crisis may alleviate balance of payments pressures and reduce foreign exchange bottlenecks.

Exporting behavior of foreign firms has been central to the research on FDI activity. There is a growing literature suggesting that foreign firms are more export oriented than domestic firms in developing countries and arguing that FDI activity has a positive effect on host countries exports. For instance, Fry (1996) finds a positive effect of FDI activity on exports of six Asian economies. Moreover, Aitken, Hanson and Harrison (1994) find that FDI activity generates export spillovers and works as catalysts for exports.

Despite the ample literature on currency crises there is only very little research on the behavior of foreign firms following crises. For instance, Lipsey (2001) looks at raw data on US firms abroad and compared their sales before and after three different currency crises in Latin America and in South East Asia to show that American firms tend to increase their exports and reduce their local sales following currency crises. These findings, however, are not based on any formal empirical investigation. Similarly, UN (1998) gives specific cases in which leading multinational corporations increase their exports from countries that are hard hit by currency crisis like Mexico in 1994 and Thailand in 1997. This is done by either relocating their plants to these countries or shifting orders across factories to increase exports from the crisis economies.

This paper contributes to the literature in two ways. First it offers a formal investigation to the export performance of foreign affiliates following currency crises. Second, it examines the effect of currency crises on the affected countries merchandise exports. This behavior of foreign firms has crucial policy implications as it lends support to the literature that argues that FDI activity has a positive effect on the balance of payments of the host country. It also points to a possible stabilizing role played by foreign firms during currency crises.

The paper proceeds as follows. Section 2 introduces a simple theoretical model and develops some hypotheses concerning the behavior of exports of foreign firms. Section 3 describes the data and section 4 explains the empirical model and the main findings of our investigation. Section 6 gives some concluding remarks.

**THEORETICAL MODEL**

We begin with a simple model of a foreign firm that serves both the host country's domestic market and its home country's market. The firm uses domestic inputs and some fixed inputs from its home country and maximizes its profits in its home country's currency. In the spirit of the work of Brander (1981) we assume that the firm is a monopolist that maximizes the following profit function:

$$Max \Pi = P^*(X^*)X^* + eP(X)X - eC(X(.)+X^*(.), W) - F. \tag{1}$$

$X, X^*$

Where  $X$  and  $X^*$  represent total sales in local and export market,  $P$  and  $P^*$  are local and exports prices and  $P(X)$  and  $P^*(X^*)$  are the inverse domestic and exports demand functions. These have the normal conditions, i.e. continuous and twice differentiable and the law of demand holds. The exchange rate,  $e$  is the home country currency per host country currency unit. A host country's currency devaluation, therefore, appears as a decline in  $e$ .  $C$  is the cost function and is assumed to be continuous and twice differentiable. Marginal cost is assumed to be increasing.  $F$  represents the fixed foreign inputs. The first order conditions are:

$$X^*: \quad P^{*'}X^* + P^* - eC' = 0 \tag{3}$$

$$X: \quad eP'X + eP - eC' = 0 \tag{4}$$

$$X: \quad P'X + P - C' = 0 \tag{4'}$$

Where  $P'$  and  $P^{*'}$  are the derivatives of the inverse demand with respect to quantity. Totally differentiating 3 and 4 with respect to  $X, X^*$  and  $e$  and using Cramer's rule we obtain:

$$dX^*/de = \{(-C') (P''X + 2P' - C'')\} / |D| > 0 \tag{5}$$

$$dX/de = -\{(-C') (-C'')\} / |D| < 0 \tag{6}$$

Equation 6 readily shows that the effect of currency crises on local sales is negative, since  $|D|$ , the determinant of the Hessian of the model, is positive by the second order condition and given the assumption of increasing marginal cost. The sign of (5) depends on the sign of the second term in the numerator ( $P''X + 2P' - C''$ ). For the second order condition to hold, we need  $d_{11} < 0$ , and  $|D| > 0$  and  $(d_{11}d_{22}) > (d_{12}d_{21})$  which means

$$d_{11} = P^{*''}X^* + 2P^{*' - eC''} < 0 \tag{7}$$

$$d_{11}d_{22} = (P^{*''}X^* + 2P^{*' - eC'') (P''X + 2P' - C'') > eC''^2 \tag{8}$$

$$|D| = \{(P^{*''}X^* + 2P^{*' - eC'') (P''X + 2P' - C'') + eC''^2\} > 0 \tag{9}$$

This implies that  $(P''X + 2P' - C'') < 0$  and therefore the sign of equation (5) is positive. Hence the above model predicts that a currency crisis may have a positive effect on the exports and a negative effect on the domestic sales of foreign affiliates in the affected economy.

Note that the switching behavior may be captured by observing changes in the shares of exports and local sales. To see this note that equations 3 and 4 can be solved explicitly for  $X = f(P', C', e)$  and  $X^* = g(P^{*'}, C', e)$  and therefore the share of exports may be expressed as:

$$R^* = q(P', P^{*'}, C', e) \tag{10}$$

Equation 10 implies that the exports share is a function of local demand, world demand, the cost function expressed for by the marginal cost and the exchange rate.

**DATA**

Data on sales by US majority owned affiliates (MOA) in 22 developing countries and 19 developed countries spanning over 18 years (from 1983 through 2000) is obtained from the Bureau of Economic Analysis BEA website. Data covers total sales, local sales, sales to the US and sales to other foreign countries. Data on RGDP and per capita RGDP is obtained from the World Bank's world development indicators CD ROM. The rest of the world variables (RWGDP and RWGDPCAP) are created by excluding the US and the host country from world RGDP and RGDP per capita data. All FDI and sales variables are converted into real US dollars using US GDP deflator obtained from the Economic Report of the President. Data on real wages in host countries is obtained from the Bureau of Labor Statistics website.

The key explanatory variable in this paper is that of currency crisis. Krugman (2000) acknowledges that “there is no generally accepted formal definition of currency crises, but we know them when we see them” (p.1). Different definitions of currency crises may actually fall into three classes. An example of the first class of definitions appears in the work of Frankel and Rose (1996) who define a currency crisis as a nominal depreciation of a currency of at least 25 percent and at least a 10 percent increase in the rate of depreciation. The second class of definitions is based on changes in the real exchange rate and foreign reserves. For example, Eichengreen et al (1995) define a currency crisis to include both the large depreciation and also speculative attacks that are successfully warded off by the authorities. A similar definition is introduced by Glick and Hutchison (1999). The third class, like in Kaminsky and Reinhart (1996), identifies currency crises when the affected country itself and \ or international financial institution, and reputable financial agencies report that there is indeed a currency crisis. This definition spares the effort of arbitrarily setting a limit for devaluation or currency pressure index.

In this paper we mainly follow the definition of currency crises introduced by Glick and Hutchison (1999, 2005) where a comprehensive currency crisis indicator is constructed based on changes in an index of the weighted average of monthly real exchange rate changes and monthly percent reserve losses. The weights are inversely related to the variance of changes of each component over the sample for each country. This measure presumes that any nominal currency changes associated with exchange rate pressure should affect the purchasing power of the domestic currency, i.e. result in a change in the real exchange rate at least in the short run. This condition excludes some large depreciations that occur during high inflation episodes, but it avoids screening out sizable depreciation events in more moderate inflation periods for countries that have occasionally experienced periods of hyperinflation and extreme devaluation. Large changes in exchange pressure are defined as changes in the pressure index that exceed the mean plus 2 times the country specific standard deviation. (Glick and Hutchison (1999)). While this definition is adopted in this paper, other definitions are used to conduct a sensitivity test.

Data from the Bureau of Economic Analysis on manufacturing sales of US majority owned foreign affiliates reveal some further instances that support the switching markets behavior. During the recent crises in Asia, exports by US majority owned affiliates in Malaysia, Thailand and Indonesia increased in relative and absolute terms and the decline in local sales was more than offset by the increase in exports.

The share of exports in total sales grew from 0.69 to 0.85 in Malaysia. In Philippines and Thailand, the share of exports in total sales rose to 0.54 and 0.72 respectively following the crisis. In Korea, however, exports declined slightly following the crises. The decline in local sales was large enough for the share of exports to recover shortly after the crisis. This increased to almost 20 percent in 1998.

A similar picture can be seen in Latin America. For instance, in the two crises in Mexico, 1985 and 1994-1995, sales to the US and to other foreign countries increased in absolute terms as well as the share of exports in sales. The share of exports to total sales increased to 0.24 in 1985. Similarly, in 1994 export growth outpaced local sales growth yielding a higher share of exports to total sales. In 1995, exports continued to increase while local sales declined. By 1996 exports more than doubled relative to 1993 level and exports share in manufactured sales recorded an all time high of 0.53.

**THE EMPIRICAL ANALYSIS**

Our empirical analysis starts with a gravity equation augmented by real wages to capture host country's competitiveness. Gravity models are widely used in examining bilateral trade and FDI as in Brainard (1997) where foreign firms' sales are determined by the involved countries' real GDP, real GDP per capita and distance between the two countries as a measure of trade frictions. Markusen and Maskus (1999, 2002) use gravity equations to examine local sales and exports by US affiliates abroad and control for host and home country characteristics. Note that the above theoretical model suggests that sales by foreign affiliates depend largely on host country and world income, price levels, and costs of production. Accordingly we break sales of foreign firms into domestic sales and exports and estimate the following equations:

$$\text{SALES}_j = f(\text{RGDP}_j, \text{RGDP}_w, \text{RGDPCAP}_j, \text{RGDPCAP}_w, \text{RWAGE}_j, \text{CCRISIS}_{jt}, \text{CCRISIS}_{jt-1}, \text{CCRISIS}_{jt-2}) \quad (1)$$

$$\text{SALES}_w = f(\text{RGDP}_j, \text{RGDP}_w, \text{RGDPCAP}_j, \text{RGDPCAP}_w, \text{RWAGE}_j, \text{CCRISIS}_{jt}, \text{CCRISIS}_{jt-1}, \text{CCRISIS}_{jt-2}) \quad (2)$$

Where  $j$  denotes host country and  $w$  denotes the rest of the world. RGDP and RGDPCAP are real GDP and real per capita GDP. CCRISIS $_j$  is a dummy variable that takes the value of "1" in one the year the crisis occurs and zero otherwise. CCRISIS $_{jt-1}$  and CCRISIS $_{jt-2}$  are the one and two year lags of currency crisis. RWAGE $_j$  is the annual real wage. In this specification income in the host country and the rest of the world is represented for by GDP and GDPCAP, while real wages proxy costs of production in the host country. The gravity specification suites country level data and is widely used in examining trade flows. Indeed, Markusen and Maskus (1999) use a semi gravity model to examine local sales and exports of foreign affiliates.

Although the theoretical model includes the exchange rate as the variable of interest, the empirical analysis uses both the exchange rate and currency crises dummies as two alternative ways of capturing the effect of currency crises. The currency crisis dummy represents the currency crisis as a major exchange rate devaluation that takes part in a specific time during the year and may not necessarily reflect on the year average exchange rate. The exchange rate, given the annual data we use, may understate currency crises, especially when the crisis is followed by a speedy recovery.

We observe different patterns in the behavior of FDI activity in developing and developed host countries in terms of the volume and the propensity to export. Indeed, US MOA operating in developing countries are more export oriented than those operating in developed countries. Therefore, and to avoid aggregation bias that forces the coefficients to be the same for the two groups, our data is split into two sub samples for developing and developed countries, as we believe that foreign firms have different motivations and may follow a different behavior in different groups. In addition, we control for the country pair fixed effects to account for unobserved country specific factors. This is particularly required since variables like distance, which is an original control variable in the gravity specification, is omitted because the rest of the world is the trading partner in our specification. In the pooled estimates these unobserved country pair effects or individual effects are assumed to be uncorrelated with other regressors, which may not be the case and therefore OLS estimates are biased. The fixed effects formulation introduces country dummy variables that allow different intercepts for each country. In doing so it drops all time invariant effects, whether observed or unobserved, and yields unbiased estimates of the coefficients on other explanatory variables. The fixed effects estimates are therefore robust to the omission of any relevant time invariant regressor like distance.

Table 1 shows the fixed effects estimates of the above equations for both developed and developing countries. Data seems to fit the model reasonably well and the fit is better in developing countries than in developed countries. In LDCs, currency crises have a positive effect on both local sales and exports, one year lagged negative effect on local sales, and a two year lagged positive effect on exports. In industrial countries group, the effect of currency crises on local sales and exports is not statistically significant.

To account for the interdependence between local sales and exports, equations 1 and 2 are estimated while holding sales to the other destinations constant. Table 2 shows the effect of currency crises in this case. Again,

currency crises have a positive effect on local sales but then have a larger negative lagged effect for two periods. This is matched with a positive lagged effect of currency crises on exports that also lasts for two periods. Notably, in the year following the crisis the magnitude of the coefficients is strikingly close in a way that lends support to the switching argument. In industrial countries group, however, the effect of currency crises on exports is still insignificant.

One major concern with the above specification is that local sales and exports may as well be endogenous. An alternative specification that is less likely to suffer these problems is to examine the effect of currency crises on the share of exports to total sales of foreign affiliates<sup>1</sup>. The above theoretical model may well motivate such a specification as in equation 10. Moreover, previous studies, Markusen and Maskus (1999) for instance, use a gravity type of specification to examine the ratio of exports to sales of foreign affiliates.

Table 3 shows the OLS and the fixed effects estimates when the share of exports to total sales is used as the dependent variable. As before, we continue to see a positive effect of currency crises on exports. This is manifested in the positive lagged effect of currency crises on the share of exports in total sales in LDCs and in developed countries. These results suggest that a currency crisis increases the share of exports in total sales of manufacturing US MOA in LDCs by some 3 percentage points in the year following the crisis and in the year after. This is a substantial increase if compared to the mean of export share in total sales in the sample, which is 0.31. In industrial countries, the magnitude of the effect is comparable but it takes two years following the crisis for that effect to materialize.

Intra firm trade represents an increasing component of international trade and a major aspect of FDI activity. BEA data show that this is true for US trade with US affiliates abroad where exports from US affiliates to parent or affiliated bodies in the US represent more than 80 percent of US affiliates exports to the US. Trends in affiliates' exports to the US, therefore, reveal a close picture to trends in intra-firm trade. The effect of currency crises on intra-firm trade is examined via the effect of on affiliates' sales to the US. Table 4 shows that currency crises have a positive effect on the share of exports to the home country in total sales by foreign affiliates in developing countries. Particularly, the magnitude of the coefficients suggests that a currency crisis brings about some 2.7 percentage point increase in sales to the US by manufacturing US MOA. The effect of currency crises on the share of exports to other foreign countries is found to be insignificant which further underlines the importance of intra-firm trade. For developed countries the effect of currency crises on the share of home country exports to total sales is insignificant. These results are intuitive if we think of developing countries as hosts of more vertical than horizontal FDI activity.

One should note that the above results may still hide some heterogeneity and may not apply to all firms at all locations. For instance, when exports levels are minimal it may be the case that firms have little experience in exporting or it is hard for the firm to export. This may be particularly true for some LDCs who yet to open up for trade and where costs of exporting are high. In order to account for this factor, the sample is divided into two groups; one includes observations where exports share is above the mean, which is 0.30 and the low group includes other observations. Results suggest that the positive effect of currency crises on export share holds only for the high group, i.e. where the share of exports is above the mean. In the low export group, however, the effect of currency crises on exports is not significant or even negative.<sup>2</sup>

The above results are robust to various sensitivity tests such as applying different measures of currency crises and the inclusion of the real exchange rate as an additional explanatory variable. Table 5 shows the latter where LOGREX is the log of the real exchange rate. Note that the inclusion of that additional variable did not have any substantial effect on the previous results and the same findings still qualitatively hold. The coefficient on the exchange rate itself is not statistically significant. When LOGREX is included as the sole control variable for currency crises, i.e. without currency crises dummy variables, the coefficient on LOGREX remains insignificant. This result may justify the use of dummy variables to control for currency crises as major events that extends beyond mere exchange rate devaluation. This becomes more important given that annual data may hide large exchange rate movements, which are liable to dilution when the year average or year-end exchange rate is used. This is particularly true when a devalued currency makes some speedy recovery.

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<sup>1</sup> We estimated the two equations with SUR and the results are qualitatively similar.

<sup>2</sup> Results are available upon request.

Finally we test the sensitivity of host countries exports to currency crises using the same specification with host countries merchandise exports being our dependent variable. Surprisingly we obtain a similar pattern as shown in table 6 where currency crises generate two year lagged positive effect on merchandise exports in developing countries. Once again the effect on merchandise exports in developed countries is not significant.

## CONCLUSION

The effect of currency crises on export behavior of foreign affiliates has hardly been examined before. Previous literature documents some links between currency crises and an increasing level of exports by foreign affiliates in the affected countries. This relationship, however, has been subject to little formal empirical investigation. This paper argues that following a currency crisis, foreign firms may increase exports to avoid loss of revenues due to local sales declines and to capitalize on lower domestic input prices and increased competitiveness following currency devaluation.

We examine the effect of currency crises on the export behavior of US majority owned affiliates in 22 developing countries and 19 developed countries. Our main findings suggest that currency crises may have a positive effect on exports while hurting local sales. Currency crises may lead to an increase in the share of exports to total sales by foreign affiliates in LDCs by some 3 percentage points in the year following the crises and the second year after. In industrial countries, the magnitude of the effect is comparable but it only materializes after two year lag. Intra-firm exports may account for the bulk of the increase in exports. A currency crisis may lead to 2.7 percentage point increase in the share of sales to the home country in the year following the crisis. This is true for LDCs but in developed countries the effect is not significant.

Nevertheless, as one may suspect, the ability to switch to exports differs across firms and across locations. The switching behavior is found to be true for countries where the share of exports to total sales is above the mean suggesting that expertise, spillover, and learning by exporting issues really matter. This paper also finds that host countries exports seem to receive a boost following currency crises, and this is found to be the case for merchandise exports by LDCs while the effect of currency crises on exports of industrial countries is insignificant.

While this paper attempts to make a significant step by examining a relatively unexplored area, further testing is needed at a more disaggregated data. Particularly, firm level data can be of a great help to closely examine how firms react or rather internalize currency crises.

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**Table1: Fixed Effects Estimates of the Effect of Currency Crises on Local Sales and Exports by Manufacturing US MOA**

Regressors	LDCs		Industrial Countries	
	Local sales	Exports	Local sales	Exports
RGDP <sub>w</sub>	.61E-11*** (.18E-10)	.74E-11** (.37E-11)	-6.78e-12 (5.55e-12)	2.40e-11** (8.08e-12)
RGDP <sub>i</sub>	.19E-09*** (.61E-10)	-.51E-10 (.84E-10)	2.02e-10*** (1.78e-11)	5.68e-11** (2.33e-11)
RGDPCAP <sub>w</sub>	-.62E-01*** (.19E-01)	-.47E-01 (.33E-01)	.16*** (.05)	-.065 (.071)
RGDPCAP <sub>i</sub>	.38E-02*** (.87E-03)	.79E-02*** (.27E-02)	.001 (.002)	.0014 (.004)
RWAGE <sub>i</sub>	-.50E-06* (.27E-06)	.25E-06 (.44E-06)	2.41** (1.15)	-3.20** (1.52)
CCRISIS <sub>i</sub>	85.6** (35.9)	75.3** (37.8)	-65.1 (78.9)	13.2 (98.4)
CCRISIS <sub>it-1</sub>	-86.1** (37.9)	20.9 (73.5)	-115.0 (83.1)	-85.6 (105.0)
CCRISIS <sub>it-2</sub>	34.7 (35.2)	206.2** (93.4)	-64.3 (80.9)	23.1 (103.8)
Adj. R-squared	.94	.87	0.60	0.44
F-Statistic	75.57***	25.80***	35.84***	16.01***
Sample Size	155	122	215	192

Robust standard errors are in parentheses with \*\*\*, \*\*, \* denote 1, 5 and 10 percent significance levels.

**Table 2: Fixed Effects Estimates of the Effect of Currency Crises on Local Sales and Exports by Manufacturing US MOA (Interdependence)**

Regressors	LDCs		Industrial Countries	
	Local sales	Exports	Local sales	Exports
Localsale		.78*** (.09)		.61*** (.076)
Exports	.49*** (.06)		.46*** (.057)	
RGDP <sub>w</sub>	3.05e-12 (2.00e-12)	3.07e-12 (2.53e-12)	-2.53e-11*** (5.03e-12)	2.48e-11*** (5.92e-12)
RGDP <sub>j</sub>	2.92e-10*** (6.58e-11)	-2.59e-10*** (8.68e-11)	1.68e-10*** (1.74e-11)	-6.27e-11** (2.47e-11)
RGDPCAP <sub>w</sub>	-.04** (.02)	.0006 (.026)	.23*** (.049)	-.13** (.06)
RGDPCAP <sub>j</sub>	-.001 (.001)	.005*** (.001)	.001 (.002)	-.001 (.003)
RWAGE <sub>i</sub>	-7.46e-07 (8.58e-07)	6.96e-07 (1.09e-06)	3.21*** (1.14)	-3.94*** (1.31)
CCRISIS <sub>j</sub>	80.1** (39.1)	-0.28 (50.3)	-70.8 (72.7)	68.2 (83.9)
CCRISIS <sub>it-1</sub>	-130.9*** (37.8)	147.4*** (48.2)	-105.4 (77.3)	19.4 (89.6)
CCRISIS <sub>it-2</sub>	-74.6* (39.5)	164.2*** (48.0)	-98.2 (76.7)	91.0 (88.5)
Adj. R-squared	0.75	0.65	0.70	0.83
F-Statistic	23.91***	22.84***	49.60***	27.33***
Sample Size	133	133	190	190

Robust standard errors are in parentheses with \*\*\*, \*\*, \* denote 1, 5 and 10 percent significance levels

**Table 3: Estimates of the Effect of Currency Crises on the Share of Exports in Total Sales by US Manufacturing MOA**

Regressors	LDCs		Industrial Countries	
	Pooled	Fixed Effects	Pooled	Fixed Effects
RGDP <sub>w</sub>	1.47e-14* (8.32e-15)	-7.13e-16 (8.37e-15)	7.18e-14*** (2.70e-14)	6.53e-14*** (1.07e-14)
RGDP <sub>j</sub>	-2.53e-13*** (8.12e-14)	-9.40e-13*** (2.87e-13)	-1.30e-13** (2.01e-14)	4.95e-14 (3.60e-14)
RGDOCAP <sub>w</sub>	-.00006*** (.00001)	.0001 (.00009)	-.0008** (.0003)	-.0003*** (.0001)
RGDPCAP <sub>j</sub>	.00002*** (2.36e-06)	-.00002*** (4.31e-06)	-.00002*** (7.35e-06)	-.00004*** (6.05e-06)
RWAGE <sub>j</sub>	-1.26e-08*** (2.62e-09)	-2.06e-09 (1.59e-09)	1.12 (.35)	.13 (.23)
CCRISIS <sub>j</sub>	-.074 (.056)	-.007 (.016)	-.16*** (.04)	-.016 (.015)
CCRISIS <sub>it-1</sub>	.00002 (.057)	.029* (.016)	-.07** (.037)	-.003 (.016)
CCRISIS <sub>it-2</sub>	-.017 (.057)	.030* (.017)	-.08** (.03)	.034** (.016)
Adj. R-squared	0.37	0.40	0.36	0.27
F-Statistic	38.81***	8.82***	9.17***	7.63***
Sample Size	133	133	190	190

Robust standard errors are in parentheses with \*\*\*, \*\*, \* denote 1, 5 and 10 percent significance levels

**Table 4: Fixed Effects Estimates of the Effect of Currency Crises on Exports to the US by US Manufacturing MOA**



Regressors	LDCs	Industrial Countries
RGDP <sub>i</sub>	1.80e-14 (5.71e-14)	-1.13e-14 (1.91e-14)
RGDP <sub>j</sub>	-7.56e-13*** (2.21e-13)	-2.52e-14** (1.07e-14)
RGDOCAP <sub>i</sub>	2.70e-06 (.00002)	.00001 (6.19e-06)
RGDPCAP <sub>i</sub>	-.00002*** (3.61e-06)	-4.04e-06** (1.87e-06)
RWAGE <sub>i</sub>	-2.36e-11 (9.06e-11)	-.002*** (.0007)
CCRISIS <sub>i</sub>	.006 (.014)	.008 (.005)
CCRISIS <sub>it-1</sub>	.027** (.014)	.007 (.005)
CCRISIS <sub>it-2</sub>	.021 (.015)	.004 (.005)
Adj. R-squared	0.44	0.20
F-Statistic	12.03***	5.22***
Sample Size	145	194

Robust standard errors are in parentheses with \*\*\*, \*\*, \* denote 1, 5 and 10 percent significance levels

**Table 5: Sensitivity test. Estimates of the Effect of Currency Crises on the Ratio of Exports to Total Sales by US Manufacturing MOA (Log of the Real Exchange Rate is Added)**

Regressors	LDCs		Industrial Countries	
	Pooled	Fixed Effects	Pooled	Fixed Effects
RGDP <sub>w</sub>	1.61e-14* (8.56e-15)	-4.19e-15 (9.17e-15)	7.04e-14*** (2.67e-14)	6.39e-14*** (1.34e-14)
RGDP <sub>j</sub>	-3.60e-13*** (1.25e-13)	-1.00e-12*** (2.96e-13)	-1.24e-13*** (2.38e-14)	4.99e-14 (3.61e-14)
RGDOCAP <sub>w</sub>	-.00006*** (.00001)	.0002* (.0001)	-.0008*** (.0003)	-.0003*** (.0001)
RGDPCAP <sub>i</sub>	.00002*** (2.39e-06)	-.00002*** (4.50e-06)	-.00002*** (7.69e-06)	-.00004*** (6.61e-06)
RWAGE <sub>i</sub>	-1.95e-08*** (5.09e-09)	-2.25e-09 (1.60e-09)	1.15*** (.36)	.20 (.48)
CCRISIS <sub>i</sub>	-.079 (.057)	-.006 (.016)	-.160*** (.041)	-.02 (.02)
CCRISIS <sub>it-1</sub>	-.008 (.058)	.030* (.016)	-.071* (.037)	-.003 (.016)
CCRISIS <sub>it-2</sub>	-.026 (.059)	.029* (.016)	-.08** (.04)	.033** (.016)
LOGREX	-.009 (.006)	.003 (.003)	-.005 (.006)	.015 (.087)
Adj. R-squared	0.38	0.41	0.36	0.27
F-Statistic	32.42***	8.23***	7.65***	6.74***
Sample Size	133	133	190	190

Robust standard errors are in parentheses with \*\*\*, \*\* and \* denote 1, 5 and 10 percent significance levels.

**Table 6: Fixed Effects Estimates of the Effect of Currency Crises on Merchandise Exports by the Affected Country**

<b>Regressors</b>	<b>LDCs</b>	<b>Industrial Countries</b>
RGDP <sub>w</sub>	.00003*** (9.55e-06)	.00001 (.00002)
RGDP <sub>j</sub>	.0001** (.0003)	.001*** (.00008)
RGDOCAP <sub>w</sub>	-18.8e-06* (10.2e-06)	29.38e-06 (21.55e-06)
RGDPCAP <sub>j</sub>	91.6e-06*** (57.1e-07)	-88.10e-6 (11.77e-05)
RWAGE <sub>j</sub>	-.06 (.47)	102.50** (43.5)
CCRISIS <sub>j</sub>	21.5 (19.2)	-39.09 (32.5)
CCRISIS <sub>it-1</sub>	27.3 (19.9)	-24.5 (33.3)
CCRISIS <sub>it-2</sub>	38.1** (19.2)	48.5 (32.1)
Adj. R-squared	0.79	0.84
F-Statistic	80.43***	112.53***
Sample Size	194	228

Robust standard errors are in parentheses with \*\*\*, \*\*, \* denote 1, 5 and 10 percent significance levels

**Table 7: Countries in the Sample**

<b>Developing Countries</b>		<b>Developed Countries</b>	
Argentina	Nigeria	Australia	Luxembourg
Brazil	Panama	Austria	Netherlands
Chile	Peru	Belgium	New Zealand
Ecuador	Philippines	Canada	Norway
Egypt	Singapore	Denmark	Spain
Hong Kong	South Africa	Finland	Sweden
India	South Korea	France	Switzerland
Indonesia	Thailand	Germany	United Kingdom
Israel	Turkey	Ireland	
Malaysia	Venezuela	Italy	
Mexico		Japan	