



IMF STAFF POSITION NOTE

March 11, 2009

SPN/09/04

Financial Crises and Emerging Market Trade

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INTERNATIONAL MONETARY FUND

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March 11, 2009

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¹ The views expressed herein are those of the author and should not be attributed to the IMF, its Executive Board, or its management.

EXECUTIVE SUMMARY

Estimates presented in this note suggest that the combination of zero net private capital flows to emerging markets and a domestic banking crisis could lower import volume growth by between 5 and 6 percent on impact (consistent with earlier work at the Fund), with a slightly lower effect on export volumes. These results support the view that general credit market conditions, including for working capital and long-term investment financing, as well as trade finance, have an important impact on international trade over and above the concurrent impact on foreign and domestic output. Although significant, the impact is less than suggested by anecdotal evidence in the current global financial crisis.

I. INTRODUCTION

The current global financial crisis and the sharp reduction in trade flows have raised questions about the extent to which access to capital affects the ability of companies to produce and sell exports and to buy imports. There is a clearly identified channel between a crisis and a fall in export and import volumes, namely the concurrent impact on foreign and domestic output. This paper looks at whether banking and financing crises have an additional impact over and above the impact of output.

Although trade credits are self-liquidating, typically backed by receivables, with low transfer and convertibility risks, they often collapse during banking crises. One reason may be that trade credits often involve only a limited relationship between the company and the bank. In the height of a crisis, banks typically reduce overall country exposure following a decision to cap an institution's country limit.² Since trade credit lines are usually short-term, can be redeemed at par, and involve limited reputational risks, they are an easy asset class to cut in times of crisis. Indeed, trade credits declined by as much as 50 percent during the peak of the recent crises in Argentina and Brazil, and fell by a comparable magnitude during the Korean crisis of 1997–98.

Surprisingly, given these magnitudes, the economic literature on the linkages between trade volumes and financing is very thin. One of the few papers written on the issue is by Ronci (2004), who considers the effects of constrained trade finance on trade flows for 10 emerging market countries experiencing financial crises. He considers three years before and after the crisis year and finds that the change in financing (defined as outstanding short-term trade credit for each country) has a significant positive effect on domestic export volumes even after controlling for changes in world export volumes and relative prices. Similarly, the

² A recent survey for bank trade financing was conducted by the IMF and the Bankers' Association for Finance and Trade and is discussed in the March 2009 issue of *Finance and Development*.

change in financing has a significant positive effect on domestic import volumes even after controlling for domestic growth and relative import prices.

This note expands the analysis of Ronci by including a larger set of countries for a longer time period to assess whether the linkages between external trade finance and trade volumes remains robust in less distressed times and for a wider sample. It also assesses whether distress in domestic financial markets adds additional stress based on a database developed by Laeven and Honohan (2005). The country sample used in this paper is the same one that was used in the IMF book entitled *Exchange Rate Analysis in Support of IMF Surveillance* (2008) except that oil exports are excluded (as they are generally thought to be financed by retained earnings). It comprises 36 emerging market economies (classified as middle-income countries according to the World Bank's World Development Indicators) and two low-income countries (India and Pakistan, chosen for their importance in world trade and their access to market financing).³

II. ECONOMETRIC ANALYSIS

The analysis starts from a standard trade equation that relates import/export volumes to a measure of relative prices and domestic/foreign income. The relative price used for imports is the import deflator divided by the domestic consumer price index, while the income term is domestic real GDP. Both coefficients are expected to be positive. For exporters a distinction is made between exporters of manufacturers and of commodities. For manufactures the relative price is the export deflator divided by the unit labor cost of trading partners, and is expected to be negative since the relationship is assumed to be demand determined. For non-oil commodity exporters a supply relationship is estimated, with the relative price defined as the world non-oil commodity price index divided by the CPI, and the coefficient is expected to be positive. In both cases, activity is measured as the real GDP of trading partners. The regressions are estimated on annual data over 1980–2005.

The standard trade regressions, reported in Ghosh and others (2008), include a lagged dependent variable, plus the contemporaneous and first lags of income and relative prices. The innovation in this work is to add the contemporaneous and first lags of both a country-specific variable (defined as zero if the country is stable and one if it is experiencing a financial crisis) and total net financial flows to emerging markets as a proxy for the availability of external finance. To take account of potential endogeneity, instrumental variables (in the form of generalized method of moments estimation) were used, with the instruments being lags two to five of the dependent variable and income and relative price terms.

³ Transition economies are excluded because of the significant structural changes they experienced during the 1990s.

In the regression for imports, the short-run relative price elasticity is -0.5 while the short-run income elasticity is 1.65 (Table 1). Both coefficients are significant at conventional levels, with long-run elasticities of around -1 and $1\frac{1}{2}$, respectively. These are comparable to those found in the earlier study.

For this paper, the most interesting issue is the results for the financial crisis/trade finance variables. Both the crisis dummy and private capital flows ratio are significant at or above the 90 percent level of confidence. The coefficient on the banking crisis is -0.021 so that when a country experiences a banking crisis, import volume growth declines by over 2 percent immediately, all else equal. Given the size of the lagged dependent variable and small

Table 1. Volume of Imports: Coefficient Estimates and Implied Elasticities

	Coefficient estimates	Long-run elasticities
Import volume		
First lag	0.83 ***	
Relative price for import demand 1/		
Contemporaneous	-0.50 ***	-0.94
First lag	0.34 ***	
Real GDP		
Contemporaneous	1.65 ***	1.47
First lag	-1.40 ***	
Banking crisis dummy		
Contemporaneous	-0.021 *	-0.12
First lag	0.00	
EM private capital flows (in percent of EM GDP)		
Contemporaneous	0.95 ***	7.35
First lag	0.30	
Error correction term		-0.17
Diagnostic Statistics		
# observations	895	
# countries	38	
R squared	0.8	
Tests		
Hansen test	33.10	
A-B test for AR(1)	-3.98 ***	
A-B test for AR(2)	-0.13	

Source: IMF staff estimates.

Note: * = 10% significance; ** = 5% significance, *** = 1% significance.

1/ Using CPI as the deflator.

coefficient on the lagged crisis term, this effect rises rapidly over time. The short-run coefficient on the private capital flows ratio is around unity. The private capital flows ratio has fluctuated between -0.2 and 3.1 percent of GDP over the historical period (Figure 1), with the trough occurring in the mid-1980s and late 1990s. Therefore the coefficient suggests that at its trough, when net private capital flows were slightly negative, import volumes were some 3 percent less than at its peak, with the effect again growing rapidly over time.

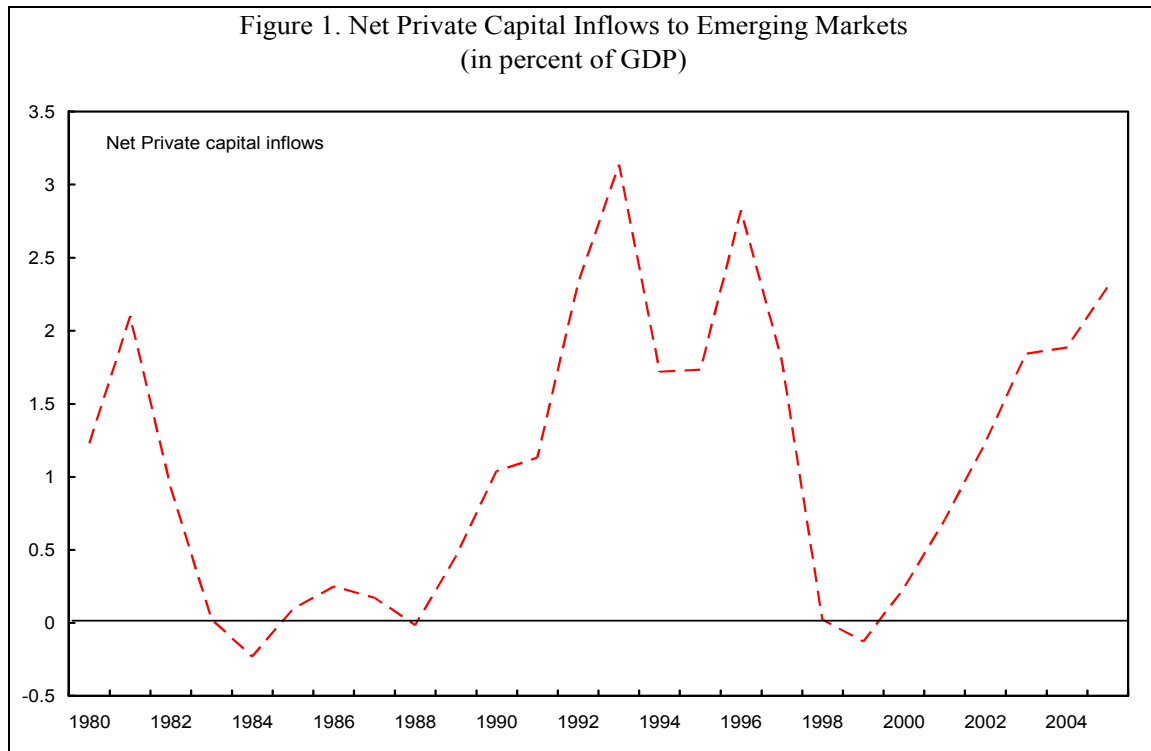
Robustness tests that include the financing variables in separate regressions yield similar coefficient estimates for the crisis dummy and private capital flows variable (see Table A1). The addition of a squared output term does not affect the coefficient estimate for the financing variables but the significance of the banking crisis coefficient is slightly below the 90 percent threshold (tables available on request). Interestingly, the results are about half as strong again using OLS with the banking crisis dummy coefficient rising to -0.032 and the private capital flow variable rising to 1.45 .

For exporters of manufactures, the relative price is negative with a short-run export price elasticity of -0.17 , while the relative income term is positive with a short-run income elasticity of 1.39 (Table 2). Both coefficients are significant at conventional levels, with long-run elasticities of around -0.5 and $+2$, respectively. Again, these results are comparable with those of the earlier study.

The crisis variable is again significant and suggests that export volumes for manufacturers fall by about 1.3 percent when countries experience domestic banking crises, and this effect rises over time. Private capital flows to emerging markets again have strong and significant effects on trade volumes with a short-run coefficient similar to that for imports. However, unlike imports, the impact happens with a lag.

For non-oil commodity exporters, the relative price term is positive, but the coefficient is extremely small. The foreign income term is significant with similar elasticities to those found for manufactures ($1\frac{1}{2}$ in the short run and 2 in the long run). Again, both these results are comparable to those found in the earlier study. The coefficient on the financial crisis dummy is again significant, with a short-run impact of -4 percent—some three times the size for manufactures. The coefficient on lagged private capital flows is again slightly above unity and significant in the model.⁴

⁴ We focus on the short-term effects in this paper because while the long-run coefficients are large for both the banking crisis dummy and private capital flows, full adjustment to the long-run equilibrium is unlikely to take place since crises are short and the lagged dependent variable is large.



Robustness tests that include the financing variables in separate regressions yield similar coefficient estimates for the crisis dummy and private capital flows variable (see Table A2). The only difference is that the banking crisis coefficient in the equation of exports of manufactures is significant at slightly below the 90 percent threshold. As for imports, the addition of a squared output term does not affect the coefficient estimates of financing variables but does affect the significance: the banking crisis coefficient has a level of significance slightly below 90 percent. In contrast to the finding for imports, the OLS method of estimation weakens the results for exports of manufactures with the banking crisis dummy coefficient much smaller at -0.007 (private capital flows at 1.37) although the coefficients for commodity exporters are comparable at -0.037 for the crisis dummy and 0.97 for private capital flows.

Table 2. Export Volumes: Coefficient Estimates and Implied Elasticities

	Manufacturing exporters (demand)		Non-oil commodity exporters (supply)	
	Coefficient estimates	Long-run elasticities	Coefficient estimates	Long-run elasticities
Volume				
First lag	0.85 ***		0.89 ***	
Relative price				
Contemporaneous	-0.17 ***	-0.47	0.01	0.00
First lag	0.10 *		-0.01	
Income effects				
Contemporaneous	1.39 ***	2.20	1.51 ***	1.91
First lag	-1.06 **		-1.3 ***	
Banking crisis dummy				
Contemporaneous	-0.013 *		-0.039 *	
First lag	0.00		0.01	
EM private capital flows (in percent of GDP)				
Contemporaneous	0.03		0.28	
First lag	1.48 ***		1.27 ***	
Error correction term		-0.15		-0.11
Diagnostic statistics				
# observations	523		279	
# countries	22		12	
R squared	0.98		0.97	
Tests				
Hansen test	10.3		3.34	
A-B test for AR(1)	-3.43 ***		-2.21	
A-B test for AR(2)	-2.38 **		0.8	

Source: IMF staff estimates.

Note: * = significant at 10% level, ** = significant at 5% level, *** = significant at 1% level

1/ World non-oil commodity prices divided by CPI for non-oil commodity exporters;
export deflator divided the ULC of trading partners for manufacturing exporters.

For commodity exporters, the relative price is a 3-year moving average.

2/ Real GDP of trading partners for all export equations.

How do the results on trade finance compare with those of Ronci? In his export equation, he finds a significant coefficient of 0.039 on the change in short-term credits in U.S. dollars and a coefficient of about 0.1 for the same variable in the import equation.⁵ Since trade credits

⁵ Estimates based on the same GMM methodology.

fell by about 50 percent in Brazil and Korea and by about 30 percent in Argentina, these coefficients imply a fall of about 2 percent in export volumes and 5 percent in import volumes on account of the drying up of trade finance. Therefore while the export figure is in the ball park of the estimates obtained from this paper, the import figure estimated by Ronci is considerably larger. On the effects of a domestic banking crisis, Ronci estimates an insignificant effect on exports using the same GMM methodology as used in this paper but a large effect of 5–7 percent using GLS or IV estimates. For imports, his coefficients are more consistent across the various econometric methodologies but are extremely large, ranging from 9–11 percent a year.

III. CONCLUSION

The results presented here imply that financial conditions play a significant but not dominant role in stimulating trade volumes among emerging market countries. The estimates presented in this paper suggest that the combination of zero net private capital flows to emerging markets and a domestic banking crisis could lower import volume growth by between 5 and 6 percent immediately, with a slightly lower effect on export volumes. This is less than suggested by anecdotal evidence in the current global financial crisis, and likely reflects the fact that the initial withdrawal of financing eases relatively quickly as alternative sources of financing are discovered.

It is also important to recognize that trade finance is not the only form of credit with implications for trade volumes. Conditions in credit markets more generally, including for working capital and long-term investment financing also have an impact on international trade, including through their impact on industrial production more generally. As such, it is probably sensible for policymakers to support credit flows in general rather than to focus specifically on increasing trade finance in particular.

Table A1. Import Volumes: Coefficient Estimates and Implied Elasticities

	Coefficient estimates	Long-run elasticities	Coefficient estimates	Long-run elasticities
Volume				
First lag	0.82 ***		0.84 ***	
Relative price				
Contemporaneous	-0.52 ***	-0.89	-0.50 ***	-1.00
First lag	0.36 *		0.34 *	
Income effects				
Contemporaneous	1.75 ***	1.39	1.71 ***	1.44
First lag	-1.50 **		-1.48 **	
Banking crisis dummy				
Contemporaneous	-0.019 *	-0.12		
First lag	0.00			
EM private capital flows (in percent of GDP)				
Contemporaneous			1.02 ***	7.81
First lag			0.23	
Error correction term		-0.18		-0.16
Diagnostic statistics				
# observations	895		895	
# countries	38		38	
R squared	0.8		0.8	
Tests				
Hansen test	33.3		33	
A-B test for AR(1)	-3.92 ***		-3.94 ***	
A-B test for AR(2)	0.09		-0.12	

Source: IMF staff estimates.

Note: * = significant at 10% level, ** = significant at 5% level, *** = significant at 1% level.

Table A2. Export Volumes: Coefficient Estimates and Implied Elasticities

	Manufactures				Non-oil commodities			
	Coefficient estimates	Long-run elasticities	Coefficient estimates	Long-run elasticities	Coefficient estimates	Long-run elasticities	Coefficient estimates	Long-run elasticities
Volume								
First lag	0.85 ***		0.84 ***		0.88 ***		0.89 ***	
Relative price								
Contemporaneous	-0.17 ***	-0.47	-0.15 ***	-0.50	0.01	0.00	0.01	0.00
First lag	0.10 *		0.07 *		-0.01		-0.01	
Income effects								
Contemporaneous	1.39 ***	2.20	1.24 ***	2.19	1.5 ***	1.92	1.52 ***	2.00
First lag	-1.06 **		-0.89 **		-1.27 ***		-1.3 ***	
Banking crisis dummy								
Contemporaneous			-0.010				-0.039 *	
First lag			-0.01				0.003	
EM private capital flows (in percent of GDP)								
Contemporaneous	0.12				0.45			
First lag	1.42 ***				1.25 ***			
Error correction term		-0.15		-0.16		-0.12		-0.11
Diagnostic statistics								
# observations	523		523		279		279	
# countries	22		22		12		12	
R squared	0.98		0.98		0.97		0.97	
Tests								
Hansen test	10.3		10.3		3.34		4.21	
A-B test for AR(1)	-3.39 ***		-3.37 ***		-2.21 **		-2.24 **	
A-B test for AR(2)	-2.39 **		-2.33 **		0.8		0.8	

Source: IMF staff estimates.

Note: * = significant at 10% level, ** = significant at 5% level, *** = significant at 1% level. Estimation with intercept.

1/ World non-oil commodity prices divided by CPI for non-oil commodity exporters;
export deflator divided the ULC of trading partners for manufacturing exporters.

For commodity exporters the relative price is a 3-year moving average.

2/ Real GDP of trading partners for all export equations.

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