The impact of trade finance on international trade: Does financial development matter?

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ABSTRACT

Approximately 80 percent of global trade relies on some version of trade finance. This paper seeks to further the understanding of the relationship between trade flows and the availability of trade finance, while accounting for the development of the sample countries' financial sectors. The model also controlled for additional established variables that significantly influence trade patterns, such as import/export demand and exchange rates. The results indicate that trade finance is a positive correlate with export and import volumes. However, we also find that trade finance becomes even more important in determining trade volumes when countries have a higher level of financial development.

Keywords: Financial Development, Trade Finance, Exports, Imports

INTRODUCTION

Approximately 80 percent of global trade relies on some version of trade finance. The financing options may vary between open accounts, interfirm trade credit, or bank-intermediated trade finance (Chauffour and Malouche, 2011). During the latest financial recession, short-term trade finance fell precipitously. However, the decline in trade finance was slightly more pronounced in countries with less-developed financial sectors. For example, during the first quarter of 2009, international bank lending to non-OECD member countries fell by 14 percent, compared to 10 percent for OECD member countries (Korinek et al., 2009).

The literature supports the view that trade finance, in addition to other factors, is an important determinant of trade flow patterns (Love and Zicchino, 2006; Levchenko et al., 2009; Thomas, 2009; Korinek et al., 2009; Chor and Manova, 2011). The literature, however, fails to examine the role a country's level of financial development plays in influencing the relation between trade finance and trade flow patterns. As a result, the primary goal and contribution of this paper is to quantitatively assess the impact of trade finance on trade flows, while accounting for countries' level of financial development. Specifically, the relative impact of trade credit on trade flows for less financially developed versus more financially developed countries was compared. In addition, the model controls for two other well established variables that are known to significantly influence trade flow patterns – import/export demand and exchange rates.

Covering a long span and using relatively recent (from 1990 to 2010) country-level panel data on trade volumes, gross domestic product , real exchange rates, trade finance, and a measure of financial development, trade volume equations using various panel data methods (pooled least squares, fixed effects GLS, and random effects GLS) were estimated. Similar to prior studies, the results suggest that trade finance is a significantly positive correlate with export and import volumes (Love and Zicchino, 2006; Levchenko et al., 2009; Thomas, 2009; Korinek et al., 2009; Chor and Manova, 2011). However, this study shows that the importance of trade finance in determining import and export volumes becomes even more important as a country's level of financial development increases. From a policy standpoint, the results underscore the rationale for policies that lead to the improvement of financial infrastructures.

The remainder of this paper is organized as follows. Section 2 briefly discusses the prior literature. Section 3 describes the data and methodology employed in the econometric analysis. Section 4 presents the empirical methods used to examine the data. Section 5 discusses the results and Section 6 concludes.

LITERATURE REVIEW

There are few studies that specifically examine the long-term relationship between trade financing and trade flows. Moreover, the majority of these studies prefer to concentrate on this relationship in the context of financial or banking crises. For example, Ronci's (2004) results indicate that trade finance is only slightly positively correlated with export and import volumes in the short run. However, he further notes that in periods of financial turmoil, there exists a significantly larger positive relationship between these two variables.

The recent global financial crisis has triggered renewed interest on the determinants of trade flow patterns (Korinek et al., 2009; Freund, 2009; Evennett, 2009; Kee et al., 2010; Eaton et al., 2010; Levchenko et al., 2010; Chor and Manova, 2011). Many of these studies, however, focus on how trade finance might have led to the large observed decreases in trade flows during the crisis. For example, Korinek et al. (2009) examined (pre- and post-crisis) the effects of both the availability and the costs of short-term trade finance on imports for 43 different countries. Their findings indicate that both of these factors played a significant role in decreasing trade. Levchenko et al. (2010) studied imports and exports to the U.S. during the latest recession using disaggregated quarterly and monthly data and found that trade credit did not significantly contribute to the reduction in imports. Chor and Manova (2011) examined international trade flows for the latest global financial crisis using monthly, high frequency data on US imports. In contrast to Levchenko et al. (2010), Chor and Manova find that credit conditions during the financial recession did have a significant impact on import volumes.

Overall, the aforementioned literature supports the view that trade finance, in addition to other factors, is an important determinant of trade flow patterns. The literature, however, does not take a long-term view of this relationship and it fails to extensively examine the role a country's level of financial development plays in the relation between trade finance and trade flow patterns. In this paper, it is argued that a country's level of financial development is an important factor that influences how trade finance impacts trade flows. Some authors argue that financial development is an indicator of the degree of financing constraints faced by firms (Love and Zicchino, 2006). For instance, Love and Zicchino (2006) find that financing constraints are larger for firms in countries with less developed financial systems. In particular, their findings support the view that it is easier for firms to obtain access to external financing in countries where the financial sector is highly developed. Therefore, it is reasonable to assume that the impact of trade finance on trade flow patterns might be different between countries with very different levels of financial development.

DATA SOURCES AND MEASUREMENT TECHNIQUE

The empirical analysis is conducted using annual data for each country. The data are retrieved from various sources: the International Monetary Fund's (IMF) World Economic Outlook and International Financial Statistics (IFS) databases and the World Bank's World Development Indicators. The sample spans from 1990 to 2010, for a total of 21 annual observations per country.[1] The variables included in the export and import volume equations are real exports ($exports_{t,j}$), real imports ($imports_{t,j}$), real gross domestic product ($GDP_{t,j}$), export demand ($EXDEM_{t,j}$), real exchange rates ($RER_{t,j}$), trade finance ($FIN_{t,j}$), and a dummy variable ($DUMMY_{t,j}$) that takes the value of 1 if a country is financially developed and zero otherwise.[2] Several researchers have used these variables

[1] Due to data availability, the sample begins in 1990. Table 1 presents the descriptive statistics for all the variables included in the study, while Table 2 shows the correlation matrix.

[2] A financial development (FD) index was constructed by combining three standardized measures: foreign direct investment, market capitalization, and stocks traded; all three measures are scaled by GPD. The assignment of a "1" or "0" is determined by comparing each country's FD value to the median of the FD index.

as predictors of international trade patterns (Love and Zicchino, 2006; Thomas, 2009; Korinek et al., 2009; Freund, 2009; Evennett, 2009; Kee et al., 2010; Eaton et al., 2010; Levchenko et al., 2010; Chor and Manova, 2011). Export and import volumes are measured in constant 2000 U.S. dollars and sourced from the World Bank's World Development Indicators. For the export volume equation, export demand represents market share and is computed as the ratio of imports to total exports, specifically

$$EXDEM_{t,j} = \frac{\Sigma(imports_{i,t,j})}{\Sigma(exports_{t,j})}, \quad (1)$$

where $imports_{i,t,j}$ is considered total imports into country *i* from countries *j* at time *t.* $Exports_{t,j}$ represents total exports to *all* countries for country *j* at time *t.*

Similar to Thomas (2009), the measure of external trade finance ($FIN_{t,j}$) is constructed by dividing net portfolio inflows to the *j*th country by the *j*th country's gross domestic product.[3] There is evidence which suggests that a country's lack of financial development might be compensated by foreign portfolio flows (Manova, 2008a; Antras et al., 2009; and Manova et al., 2009).

The real exchange rate and portfolio flow data are obtained from the IMF's International Financial Statistics. Real exchange rates are used to account for relative prices. While many papers utilize relative export and import prices as an explanatory variable of trade flows, this paper used real exchanges rates due to their convenient ability to be implemented in large sample set studies. Numerous empirical studies support measuring the direct impact of real exchange rates on trade flows (De Gregorio and Wolf, 1994; Boyd et al., 2001; and Bussière et al., 2009).

EMPIRICAL MODEL

To examine how financial development and trade finance influence trade flows, econometric models similar to those found in Arize (1996), Asafu-Adjeye (1999), and Ozturk and Kalyoncu (2009) were estimated; specifically, panel data models. The export volume specification is as follows:

$$\log(exports_{t,j}) = \alpha_0 + \alpha_1 \log(EXDEM_{t,j}) + \alpha_2 RER_{t,j} + \alpha_3 FIN_{t,j} + \alpha_4 FIN_{t,j} * DUMMY_{t,j} + u_{t,j}, \quad (2)$$

where $exports_{t,j}$ are real exports for the *j*th country at time *t*, $EXDEM_{t,j}$ is a proxy for export demand, $RER_{t,j}$ is the real exchange rate index, $FIN_{t,j}$ is the trade finance proxy , and $DUMMY_{t,j}$ is the binary variable equal to 1 if a country is considered financially developed and zero otherwise.

Imports are modeled as follows:

[3] Net portfolio inflows are downloaded from the International Financial Statistics database. This variable is defined as external liabilities minus external assets. Negative values are indicative of net portfolio outflows, whereas positive values indicate a capital inflow.

$$\log(imports_{t,j}) = \alpha_0 + \alpha_1 \log(GDP_{t,j}) + \alpha_2 RER_{t,j} + \alpha_3 FIN_{t,j} + \alpha_4 FIN_{t,j} * DUMMY_{t,j} + v_{t,j}, \quad (3)$$

where $imports_{t,j}$ are real imports for the *j*th country at time *t* and $GDP_{t,j}$ is the real gross domestic product for the *j*th country. All other variables are defined as before.

Finally, this paper utilizes panel data to test for correlations between trade volumes and the explanatory variables already discussed. The equations are estimated using pooled least squares, cross-section fixed effects (FE) GLS which accounts for the presence of cross-section heteroskedasticity, and cross-section random effects (RE) GLS. The FE model should be used if one suspects that the error terms may be correlated with the individual effects among the regressors. If the error terms are assumed to be uncorrelated with the regressors, then the RE model should be selected. To determine whether the FE or RE estimation methodology is appropriate, the Hausman specification test is used. This test will determine whether there is a significant correlation between unobserved country-specific random effects and the regressors. If the test finds no correlation, then the RE model should be used. However, if correlation is found, then the use of the RE model is inappropirate, and the FE model should be used. The Hausman test is a type of Wald chi-squared (χ^2) test with *k-1* degrees of freedom, where *k* is the number of regressors. The selection of the FE or RE model is determined by the value of the Hausman test statistic *m*. If *m* is larger than the critical χ^2, then the null hypothesis that random effects are uncorrelated with the regressors can be rejected and the FE model should be selected.

RESULTS

Tables 3 – 8 contain econometric results based on pooled, fixed effect GLS, and random effect GLS testing.[4] All the tables contain a base model, which includes regressors that are commonly used to explain export and import volumes. For the export volume equations, this includes export demand (*EXDEM*) and real exchange rates (*RER*). For imports, it includes real gross domestic product (*GDP*) and real exchange rates (*RER*). The base models are augmented by including trade finance (*FIN*), as well as the dummy variable (DUMMY), which accounts for each country's level of financial development. Furthermore, trade finance is interacted with the dummy variable.

Tables 3-5 report the results from estimating the export volume equations using pooled, fixed effects, and random effects methods. The base model generally shows that export demand (*EXDEM*) has a positive and significant influence on exports. Furthermore, the results show that the proxy for relative prices (*RER*) is inversely related to exports. That is, as relative prices go up a country loses exports. Next, the trade finance proxy (*FIN*) is added to the base model. Across all three specifications, the trade

[4]All tables are located in the Appendices. Export volumes are shown in Tables 3 – 5 and import volumes are in Tables 6 – 8.

finance proxy has a positive and significant impact on exports. For example, Table 4, Model 4.2 shows that the estimated coefficient for trade finance is 2.202, and is statistically significant at the 1 percent level. This indicates that as countries gain access to external trade financing, they are able to export more.

Finally, the interaction of the trade finance proxy with the financial development dummy (*FIN*DUMMY*) is added to Model 4.2. Across all three specifications, the estimated coefficient on the interaction term is positive and significant. For example, Table 4 Model 4.3 shows that the estimated coefficient for trade finance and financial development interaction term is 2.197, and is statistically significant at the 1 percent level. This indicates that countries with greater financial development tend to benefit more (have higher exports) from trade finance, than do countries with lower financial development. In general, export volume estimations show that trade finance and financial development are important determinants of exports.

All the export tables indicate a strong positive correlation between export volume and export demand. This correlation was expected based on the large amount of empirical work that establishes strong economic relationships between many of the countries in the sample as well as between countries with relatively high GDPs. However, strength of significance relationship differences emerged when comparing the pooled vs. fixed GLS tables. The pooled models in Table 3 contained significantly stronger correlations between the export volume and export demand.

The impact of real exchange rates on exports was expected to be negative. A negative *RER* would suggest that as a nation's currency depreciated against the dollar, the result would be higher demand for its exports. This expected relationship was successfully established based on Tables 3 – 5. While the correlation between *RER* and exports was generally very weak, still the negative direction of the relationship, as well as its statistical significance, was affirmed.

The import tables also contained a positive and significant relationship between import volumes and domestic demand, as shown in the base models. Moreover, the impact of real exchange rates on import volumes was positive, suggesting correctly that as the currency of domestic nations strengthens, their level of imports tends to increase. The strength of *RER* on import volumes was weak yet significant, which is similar to RER's relationship with export volumes.

The impact of portfolio flows (*FIN*) on export and import volume was, in most cases, positive and significant at the 1- and 5-percent levels, indicating the clear role trade finance has in determining trade flows, which has been recently re-established by Chauffour and Malouche (2011). Furthermore, when interacting *FIN* with the dummy financial development variable, an interesting finding was confirmed. Nations at higher levels of financial development very consistently had a stronger relationship between trade finance and trade volume. For the pooled Model 3.3, the elasticity of export volume with respect to trade finance was 0.180. However, when interacted with the financial development dummy variable, the relationship strengthened to 2.43 and increased in level of significance. Similar elasticity improvements were found in the fixed and random effects export tables. On the import side, the pooled, fixed effect, and random effect interaction coefficients were relatively smaller than the export interaction coefficients; however, the import coefficients were still robust and significant. These

findings suggest that countries with stronger financial infrastructures are able to better utilize trade finance dollars to positively impact their trade positions.

The results of the Hausman test indicate that the FE model is preferred due to the *m* values (Hausman test statistics) being relatively higher than the critical χ^2 values. The results of the majority of the Hausman tests confirm that differences in the coefficients are systematic; therefore, the preference is in favor of the FE models, which have more robust parameter values and R^2s.

CONCLUSION

The goal of this paper was to assess the relationship between trade volume and trade finance. Using country-level panel data on trade volumes, gross domestic product, real exchange rates, trade finance, and a measure of financial development, the results indicate that trade finance is a significantly positive correlate with export and import volumes. However, it is found that trade finance becomes even more important in determining import and export volumes when countries have a higher level of financial development.

The specifications were estimated based on pooled least squares, fixed effects GLS, and random effects GLS modeling techniques. The Hausman test confirmed that the more robust FE model was preferred. From a policy standpoint, the results underscore the rationale for policies that lead to the improvement of financial infrastructures. Therefore, a logical next step of the analysis should be researching: 1) what specific aspects of financial development have the most impact on trade volumes and 2) if specific sets of countries (for example, developed vs. developing) have shared characteristics of financial development that influence trade volumes.

APPENDIX

Figure 1: Total Exports and Export Percent Change (Low)

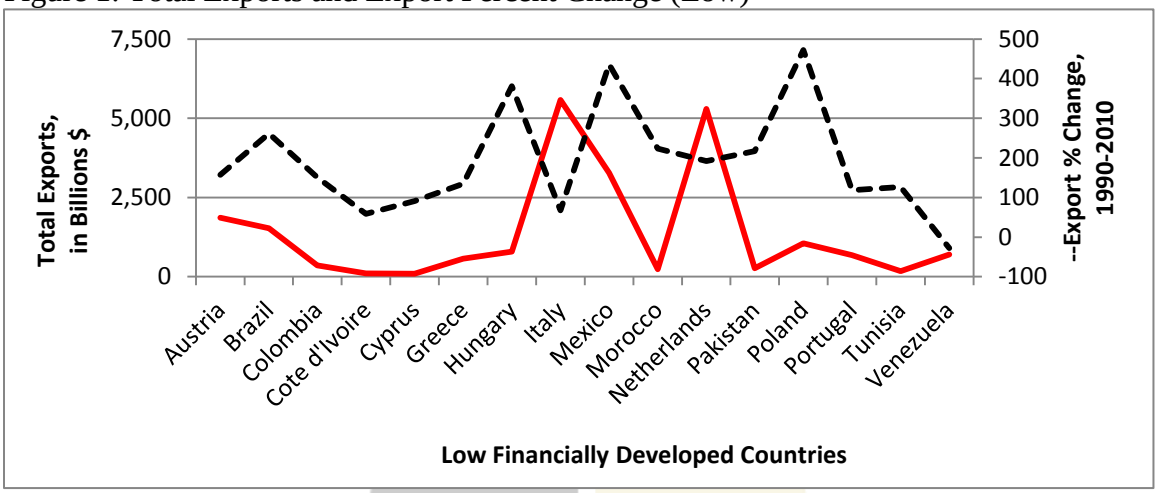

Figure 1 illustrates cumulative (1990 – 2010) exports for each country classified as "Low" regarding its level of financial development. This data is represented by the solid line and left Y-axis. The percent change in total exports from 1990 to 2010 for each country is represented by the dotted line and right Y-axis.

Figure 2: Total Exports and Export Percent Change (High)

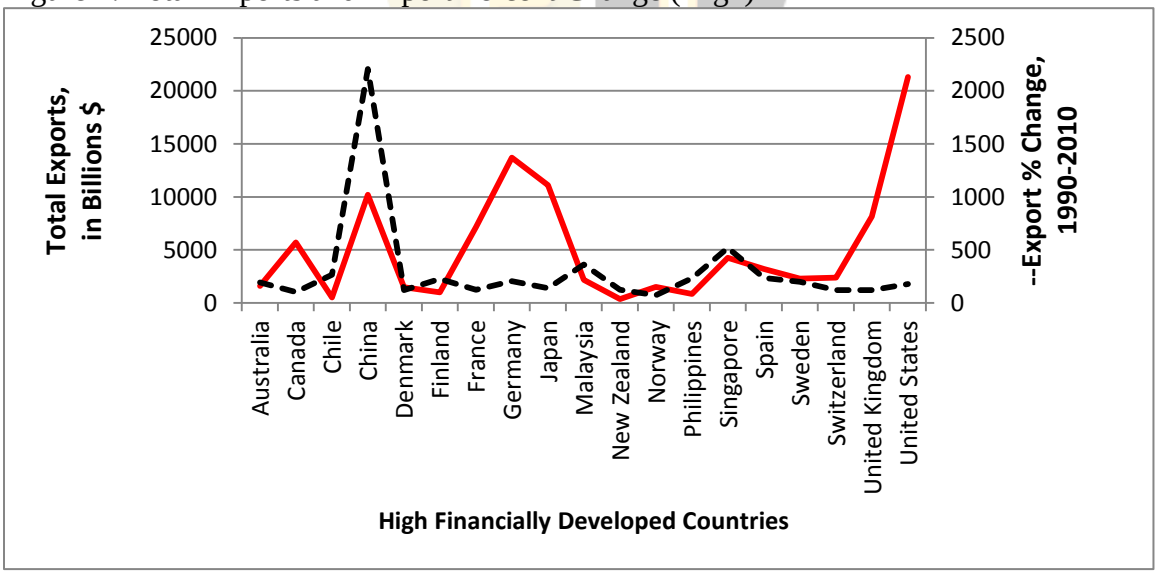

Figure 2 illustrates cumulative (1990 – 2010) exports for each country classified as "High" regarding its level of financial development. This data is represented by the solid line and left Y-axis. The percent change in total exports from 1990 to 2010 for each country is represented by the dotted line and right Y-axis.

Figure 3: Total Imports and Import Percent Change (Low)

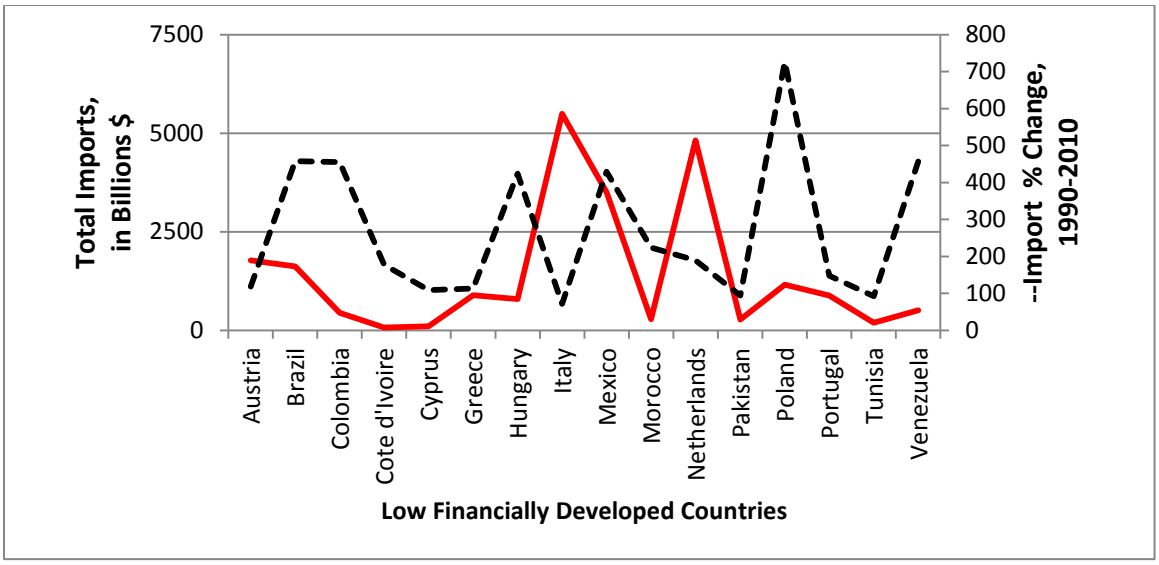

Figure 3 illustrates cumulative (1990 – 2010) imports for each country classified as "Low" regarding its level of financial development. This data is represented by the solid line and left Y-axis. The percent change in total imports from 1990 to 2010 for each country is represented by the dotted line and right Y-axis.

Figure 4: Total Imports and Import Percent Change (High)

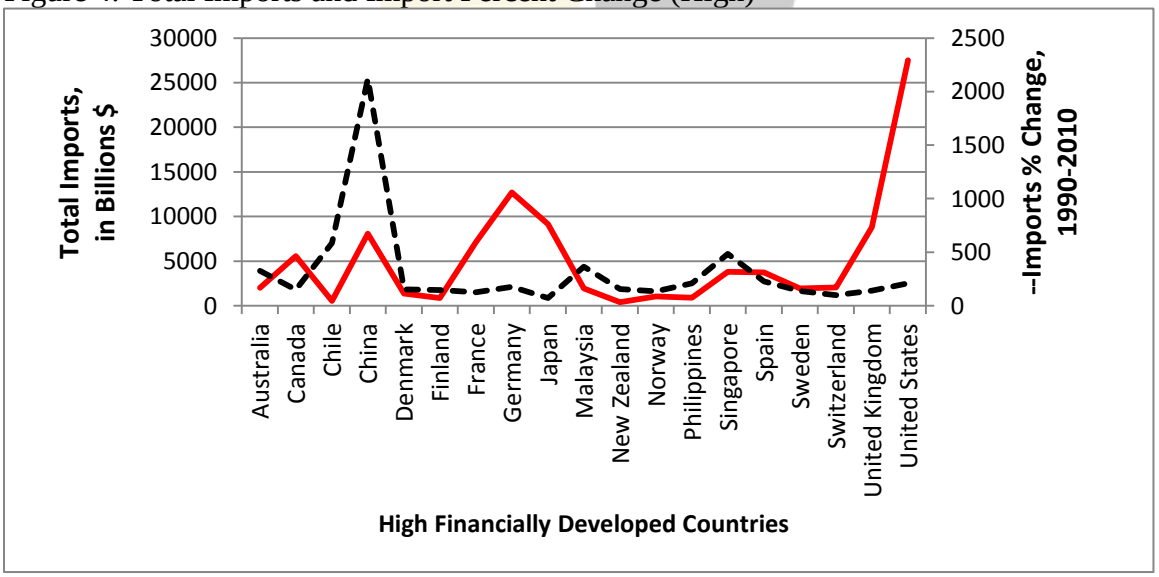

Figure 4 illustrates cumulative (1990 – 2010) imports for each country classified as "High" regarding its level of financial development. This data is represented by the solid line and left Y-axis. The percent change in total imports from 1990 to 2010 for each country is represented by the dotted line and right Y-axis.

Table 1. Descriptive statistics.

	Mean	Median	Maximum	Minimum	Std. Dev.
Exports	$165.00	$70.80	$1,530.00	$2.68	$245.00
Imports	$166.00	$65.5	$1,980.00	$1.85	$270.00
GDP	$771.00	$162.00	$11,700.00	$6.19	$1,760.00
EXDEM	0.02	0.01	0.17	0.00	0.03
FIN	0.03	0.02	0.38	-0.15	0.04
RER	100.84	100.00	195.25	37.51	14.24

This table provides descriptive statistics for the variables used in the investigation which are the: real exports ($exports_{t,j}$), real imports ($imports_{t,j}$), real gross domestic product ($GDP_{t,j}$), export demand ($EXDEM_{t,j}$), trade finance ($FIN_{t,j}$), and the real exchange rate ($RER_{t,j}$). The sample spans from 1990 through 2010, for a total of 21 annual observations per country. All data are in an annual frequency. All dollars are in billions. The real exchange rate and the portfolio flow data used to construct the trade finance proxy are obtained from International Financial Statistics (IFS). Data for exports, imports, gross domestic product, and export demand all come from the IMF's World Economic Outlook database as well as the World Bank's World Development Indicators.

Table 2. Correlation Matrix

	Exports	*Imports*	*GDP*	*EXDEM*	*FIN*	*RER*
Exports	1.00					

Imports	0.96	1.00				
	(0.00)	---				
GDP	0.84	0.90	1.00			
	(0.00)	(0.00)	---			
EXDEM	0.85	0.90	0.89	1.00		
	(0.00)	(0.00)	(0.00)	---		
FIN	0.14	0.16	0.07	0.13	1.00	
	(0.00)	(0.00)	(0.08)	(0.00)	---	
RER	0.00	0.01	0.02	0.00	-0.12	1.00
	(0.91)	(0.89)	(0.60)	(0.93)	(0.00)	---

This table provides the correlation matrix for the variables used in the investigation which are: real exports ($exports_{t,j}$), real imports ($imports_{t,j}$), real gross domestic product ($GDP_{t,j}$), export demand ($EXDEM_{t,j}$), trade finance ($FIN_{t,j}$), and the real exchange rate ($RER_{t,j}$). The sample spans from 1990 through 2010, for a total of 21 observations per country. All data are in an annual frequency. The real exchange rate and the portfolio flow data used to construct the trade finance proxy are obtained from International Financial Statistics (IFS). Data for exports, imports, gross domestic product, and export demand all come from the IMF's World Economic Outlook database as well as the World Bank's World Development Indicators. The *p*-values are in parentheses.

Table 3. Export volume equation, pooled least squares

	Model 3.1	*Model 3.2*	*Model 3.3*
C	26.761***	29.570***	29.513***
	(0.228)	(0.140)	(0.103)
EXDEM	0.327***	0.979***	0.969***
	(0.043)	(0.012)	(0.013)
RER	-0.002***	0.001	0.001
	(0.001)	(0.001)	(0.001)
FIN		1.151***	0.180
		(0.386)	(0.669)
*FIN*DUMMY*			2.250***
			(0.590)
Adj. *R*-squared	0.944	0.898	0.900

This table provides the coefficient estimates for the pooled least squares estimation of equation (2) in the text. Furthermore, the variance-covariance matrix is calculated using White's cross-section estimator. The variables used in the investigation are: real exports ($exports_{t,j}$), real imports ($imports_{t,j}$), real gross domestic product ($GDP_{t,j}$), export demand ($EXDEM_{t,j}$), trade finance ($FIN_{t,j}$), and the real exchange rate ($RER_{t,j}$). The sample spans from 1990 through 2010, for a total of 21 observations per country. All data are in an annual frequency. The real exchange rate and the portfolio flow data used to construct the trade finance proxy are obtained from International Financial Statistics (IFS). Data for exports, imports, gross domestic product, and export demand all come from the IMF's World Economic Outlook database as well as the World Bank's World Development Indicators. Standard errors are in parentheses and *, **, *** denotes significance at the 10%, 5%, and 1% level, respectively.

Table 4. Export volume equation, GLS fixed effects

	Model 4.1	*Model 4.2*	*Model 4.3*
C	26.761***	26.545***	26.618***
	(0.228)	(0.229)	(0.209)
EXDEM	0.327***	0.311***	0.322***
	(0.043)	(0.044)	(0.042)
RER	-0.002***	-0.001*	-0.002***
	(0.000)	(0.000)	(0.000)
FIN		2.202***	1.227***
		(0.494)	(0.488)
*FIN*DUMMY*			2.197***
			(0.869)
Adj. *R*-squared	0.944	0.948	0.949
Redundant fixed effects test	14.881***	15.214***	15.446***

This table provides the coefficient estimates for the GLS estimation of equation (2) in the text. The variables used in the investigation are: real exports ($exports_{t,j}$), real imports ($imports_{t,j}$), real gross domestic product ($GDP_{t,j}$), export demand ($EXDEM_{t,j}$), trade finance ($FIN_{t,j}$), and the real exchange rate ($RER_{t,j}$). The sample spans from 1990 through 2010, for a total of 21 observations per country. All data are in an annual frequency. The real exchange rate and the portfolio flow data used to construct the trade finance proxy are obtained from International Financial Statistics (IFS). Data for exports, imports, gross domestic product, and export demand all come from the IMF's World Economic Outlook database as well as the World Bank's World Development Indicators. Standard errors are in parentheses and *, **, *** denotes significance at the 10%, 5%, and 1% level, respectively. The last column reports the *F*-statistic for the likelihood ratio test for redundant fixed effects; the null hypothesis is that of redundant fixed effects.

Table 5. Export volume equation, GLS random effects

	Model 5.1	*Model 5.2*	*Model 5.3*
C	30.052***	29.894***	29.847***
	0.188	0.190	0.190
EXDEM	0.961***	0.946***	0.939***
	0.025	0.026	0.026
RER	-0.004***	-0.004***	-0.004***
	0.001	0.001	0.001
FIN		1.962***	1.037**
		0.355	0.462
*DUMMY*FIN*			2.131***
			0.684
Adj. *R*-squared	0.642	0.642	0.645
Hausman test	27.482***	31.189***	29.706***

This table provides the coefficient estimates for the GLS estimation of equation (2) in the text. The equations are estimated using cross-section random effects GLS. Furthermore, the variance-covariance matrix is calculated using White's cross-section estimator. The variables used in the investigation are: real exports ($exports_{t,j}$), real imports ($imports_{t,j}$), real gross domestic product ($GDP_{t,j}$), export demand ($EXDEM_{t,j}$), trade finance ($FIN_{t,j}$), and the real exchange rate ($RER_{t,j}$). The sample spans from 1990 through 2010, for a total of 21 observations per country. All data are in an annual frequency. The real exchange rate and the portfolio flow data used to construct the trade finance proxy are obtained from International Financial Statistics (IFS). Data for exports, imports, gross domestic product, and export demand all come from the IMF's World Economic Outlook database as well as the World Bank's World Development Indicators. Standard errors are in parentheses and *, **, *** denotes significance at the 10%, 5%, and 1% level, respectively. The last column reports the chi-squared statistic for the Hausman test for correlated random effects.

Table 6. Import volume equation, pooled least squares

	Model 6.1	*Model 6.2*	*Model 6.3*
C	2.889***	3.083***	3.207***
	0.158	0.186	0.187
GDP	0.834***	0.820***	0.815***
	0.004	0.006	0.007
RER	0.002**	0.003***	0.003***
	0.001	0.001	0.001
FIN		2.514***	2.023***
		0.637	0.826
*DUMMY*FIN*			1.138
			1.019
Adj. *R*-squared	0.852	0.858	0.858

This table provides the coefficient estimates for the pooled least squares estimation of equation (3) in the text. The equations are estimated using pooled least squares. Furthermore, the variance-covariance matrix is calculated using White's cross-section estimator. The variables used in the investigation are: real exports ($exports_{t,j}$), real imports ($imports_{t,j}$), real gross domestic product ($GDP_{t,j}$), export demand ($EXDEM_{t,j}$), trade finance ($FIN_{t,j}$), and the real exchange rate ($RER_{t,j}$). The sample spans from 1990 through 2010, for a total of 21 observations per country. All data are in an annual frequency. The real exchange rate and the portfolio flow data used to construct the trade finance proxy are obtained from International Financial Statistics (IFS). Data for exports, imports, gross domestic product, and export demand all come from the IMF's World Economic Outlook database as well as the World Bank's World Development Indicators. Standard errors are in parentheses and *, **, *** denotes significance at the 10%, 5%, and 1% level, respectively.

Table 7. Import volume equation, GLS fixed effects

	Model 7.1	*Model 7.2*	*Model 7.3*
C	-23.640***	-23.245***	-23.319***
	0.702	0.747	0.808
GDP	1.849***	1.834***	1.836***
	0.027	0.029	0.031
RER	0.003***	0.003***	0.003***
	0.000	0.000	0.000
FIN		0.363***	0.337***
		0.098	0.093
*DUMMY*FIN*			0.086
			0.125
Adj. *R*-squared	0.994	0.995	0.994
Redundant fixed effects test	428.490***	410.354***	398.553***

This table provides the coefficient estimates for the GLS estimation of equation (3) in the text. The equations are estimated using cross-section fixed effects GLS which accounts for the presence of cross-section heteroskedasticity. Furthermore, the variance-covariance matrix is calculated using White's cross-section estimator. The variables used in the investigation are: real exports ($exports_{t,j}$), real imports ($imports_{t,j}$), real gross domestic product ($GDP_{t,j}$), export demand ($EXDEM_{t,j}$), trade finance ($FIN_{t,j}$), and the real exchange rate ($RER_{t,j}$). The sample spans from 1990 through 2010, for a total of 21 observations per country. All data are in an annual frequency. The real exchange rate and the portfolio flow data used to construct the trade finance proxy are obtained from International Financial Statistics (IFS). Data for exports, imports, gross domestic product, and export demand all come from the IMF's World Economic Outlook database as well as the World Bank's World Development Indicators. Standard errors are in parentheses and *, **, *** denotes significance at the 10%, 5%, and 1% level, respectively. The last column reports the *F*-statistic for the likelihood ratio test for redundant fixed effects; the null hypothesis is that of redundant fixed effects.

Table 8. Import volume equation, GLS random effects

	Model 8.1	*Model 8.2*	*Model 8.3*
C	-17.707***	-17.209***	-17.198***
	0.605	0.610	0.613
GDP	1.614***	1.595***	1.594***
	0.023	0.023	0.023
RER	0.005***	0.005***	0.005***
	0.000	0.000	0.000
FIN		0.449***	0.104
		0.142	0.186
*DUMMY*FIN*			0.797***
			0.283
Adj. *R*-squared	0.838	0.839	0.840
Hausman test	265.802***	272.974***	264.657***

This table provides the coefficient estimates for the GLS estimation of equation (3) in the text. The equations are estimated using cross-section random effects GLS. Furthermore, the variance-covariance matrix is calculated using White's cross-section estimator. The variables used in the investigation are: real exports ($exports_{t,j}$), real imports ($imports_{t,j}$), real gross domestic product ($GDP_{t,j}$), export demand ($EXDEM_{t,j}$), trade finance ($FIN_{t,j}$), and the real exchange rate ($RER_{t,j}$). The sample spans from 1990 through 2010, for a total of 21 observations per country. All data are in an annual frequency. The real exchange rate and the portfolio flow data used to construct the trade finance proxy are obtained from International Financial Statistics (IFS). Data for exports, imports, gross domestic product, and export demand all come from the IMF's World Economic Outlook database as well as the World Bank's World Development Indicators. Standard errors are in parentheses and *, **, *** denotes significance at the 10%, 5%, and 1% level, respectively. The last column reports the chi-squared statistic for the Hausman test for correlated random effects.

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