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EXCHANGE RATE VOLATILITY AND EXPORT MARGINS

Roberto Álvarez Michael Doyle Ricardo A. López

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EXCHANGE RATE VOLATILITY AND EXPORT MARGINS

Roberto Álvarez
Banco Central de Chile
y Universidad de Chile

Michael Doyle
United Airlines

Ricardo A. López*
Departamento de Economía
Indiana University

Resumen

Este trabajo examina el efecto de la volatilidad del tipo de cambio real sobre los márgenes intensivo y extensivo de las exportaciones. Utilizando datos detallados de exportaciones a Estados Unidos por producto y por país de origen, y una metodología que corrige por la endogeneidad de la volatilidad cambiaria, se encuentra que la volatilidad del tipo de cambio tiene efectos negativos sobre el comercio internacional. Este resultado sugiere que la volatilidad cambiaria puede hacer los países más dependientes de un conjunto reducido de productos, lo que es especialmente importante para economías en desarrollo con exportaciones poco diversificadas. Este efecto debería ser parte de la discusión de los encargados de escoger el sistema cambiario de los países.

Abstract

This paper examines the effect of real exchange rate volatility on the intensive margin and the extensive margin of exports. Using highly disaggregated U.S. import data by product and country of origin, and a methodology that takes into account the possible endogeneity of volatility to trade, this paper finds that exchange rate volatility hinders trade by reducing the number of goods exported by countries. This result suggests that exchange rate volatility can make countries more dependent on a narrower set of export goods, particularly in developing economies with export concentration. Policy makers should take this effect into account when deciding their exchange rate regimes.

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* Corresponding author. Address: Wylie Hall 105, 100 S. Woodlawn, Department of Economics, Indiana University, Bloomington, IN 47405, USA. Telephone: +1-812-856-1466. Fax: +1-812-855-3736. Email: rialopez@indiana.edu.

1. Introduction

Many policy makers around the world are convinced that exchange rate volatility reduces the level of international trade. Among economists, however, there is no consensus on the nature of this relationship. Economic theory, on the one hand, predicts an ambiguous relationship between volatility and trade (McKenzie, 1999; Clark et al., 2004), while a series of empirical studies, on the other hand, finds evidence of either a negative relationship, a positive relationship, or no significant relationship between volatility and trade (Côté, 1994; McKenzie, 1999; Clark, 2004; Ozturk, 2006; Bahmani-Oskooee and Hegerty, 2007).[1]

Although the empirical literature has made important contributions to understanding the effects of volatility on trade, one aspect that has been overlooked is the identification of the channels by which volatility affects trade. Does volatility affect the quantity exported of each good (the intensive margin)? Does volatility affect the range of goods countries export (the extensive margin)? These are the questions this paper tries to answer.

Investigating if exchange rate volatility affects trade is obviously important from a policy point of view. If exchange rate volatility reduces trade, then policy makers should implement policies aimed at reducing that type of volatility. But equally important is to understand the way by which volatility affects trade (i.e., through the intensive or the extensive margin). If volatility affects not only the quantity of goods exported but also

[1] According to Côté (1994) while most empirical studies find a negative effect of volatility on trade, the magnitude of the effect is small.

the range of goods exported, then exchange rate fluctuations can make economies more dependent on a narrower set of export goods. Thus higher volatility may reduce countries' ability to expand their export baskets, which may increase their vulnerability to external shocks. This may, in turn, generate a vicious circle: more export dependent countries (low export diversification) may face more volatile terms of trade (and exchange rates), and the higher volatility may impede the surge of new exported products. This possibility is exacerbated by the fact that many countries have recently moved to more flexible exchange rate systems.

This paper considers the real exchange rate (RER) as the relevant variable to measure exchange rate volatility. When firms make decisions about how much to produce for international markets and the number of goods to produce, they take into account not only the volatility of the nominal exchange rate but also the variability of prices. If changes in prices are offset by changes in the nominal exchange rate then these changes may have little effect on firms' decision (Côté, 1994). Thus, we use the RER as the relevant variable to measure volatility.[2] From a conceptual point of view, deciding between nominal and real exchange rates is important, but from a practical perspective the distinction does not seem to be crucial. First of all, real and nominal exchange rates seemed to have moved closely together during the period of floating exchange rates (Clark et al., 2004), and second, the results of using nominal exchange rates appear to be similar to those obtained with real exchange rates (McKenzie, 1999).

[2] According to Clark et al. (2004), the use of real exchange rate is preferable on theoretical grounds.

Using the methodology introduced by Hummels and Klenow (2005), this paper decomposes a country's exports (relative to the rest of the world) between the intensive margin and the extensive margin using U.S. product-level import data by country of origin for the period of floating exchange rates. The effect of RER volatility is estimated in a framework that controls for several variables that may affect export margins, as well as for unobserved country characteristics. Since volatility may not be exogenous to trade, an IV approach is used to check the robustness of the results. The estimation results show that volatility affects overall exports mainly through the extensive margin of trade. The effect of trade on the intensive margin is not statistically significant. This suggests that volatility may not necessarily reduce the quantity exported of each good but it may reduce the number of goods exported by countries, making them more dependent on a narrower set of export goods.

The results of this paper are related to a recent paper by Freund and Pierola (2008). They study the role of exchange rate on export surges, which they define as cases of "a significant and sustained increase in manufacturing export growth from one 7-year period to the next 7-year period." (Page 3). They find that export surges are preceded by large real exchange rate devaluations and lower exchange rate volatility. They also show that the discovery of new products and markets is an important element of export surges, accounting for about 25% of the increase in manufacturing exports in the cases of export surges they consider. A related paper by Bergin and Lin (2008) also looks at the relationship between export margins and exchange rate using bilateral trade data. Their main focus, however, is on the effect of different exchange rate regimes. Even though they also include exchange rate volatility as a determinant of trade, they do not use

instrumental variables to correct for the endogeneity of this variable. Moreover, they do not control for the effect of other country-specific variables such as openness to trade, financial development, trade costs, and tariffs.

The paper is organized as follows. Section 2 presents a first look at the data and shows simple correlations between RER volatility and export margins. Section 3 introduces the methodology employed to examine the relationship between export margins and volatility. Section 4 presents and discusses the results of the empirical analysis. Section 5 concludes.

2. A First Look at the Data

This paper uses the U.S. import dataset assembled by Robert Feenstra, which contains imports by product and country of origin for the period of 1972-2001.[3] Following Hummels and Klenow (2005), a country's exports relative to the rest of the world, S_{ct}, may be decomposed into two margins: intensive and extensive. The relative exports, which are referred to overall exports share in the rest of the paper, are given by:

$$S_{ct} = \frac{\sum_{i=1}^{I} x_{cit}}{\sum_{i=1}^{I} x_{wit}},$$

[3] The dataset is available online at http://www.internationaldata.org/.

where x_{cit} is the export value of country c of product category i at time t, and x_{wit} is the export value of a reference country w. I represents the total number of products exported to the U.S. in the year t. In the empirical analysis, w will be rest of the world.

The extensive margin is given by:

$$EM_{ct} = \frac{\sum_{i=1}^{I_c} x_{wit}}{\sum_{i=1}^{I} x_{wit}},$$

where I_c is the set of observable products in which country c has positive exports to the U.S. The extensive margin captures the idea that exports may be larger due to an increase in the number of exported products. These products are weighted by their importance in rest of the world's exports to the destination market.

The intensive margin, which is a measure of a country's exports relative to the rest of the world in the same set of products, is given by:

$$IM_{ct} = \frac{\sum_{i=1}^{I_c} x_{cit}}{\sum_{i=1}^{I_c} x_{wit}}.$$

The overall exports share is the product of both margins. This property will help us to analyze how the effect of a certain variable, for example exchange rate volatility in the overall participation of a country in U.S. imports, may be explained by changes in the

number of products exported and by changes in the export value of products that are already exported by other countries.[4]

This paper measures exchange rate variability as the standard deviation of the first difference of logarithms of the exchange rate:[5]

$$(1) \qquad Volatility_t^{i,US} = Std.Dev.[\log RER_{m,t}^{i,US} - \log RER_{m-1,t}^{i,US}], \quad m = 1,...,12$$

where $RER_{m,t}^{i,US} = \frac{NER_{m,t}^{i,US} * CPI_{m,t}^{US}}{CPI_{m,t}^{i}}$, $NER_{m,t}^{i,US}$ is the nominal exchange rate of country *i* (country *i*'s currency per U.S. dollar) in month *m* (*m=1, … , 12*) and year *t* (*t=1970, … , 2001*), $CPI_{m,t}^{US}$ is the consumer price index of the U.S. in month *m* and year *t*, while $CPI_{m,t}^{i}$ is the consumer price index of country *i* in month *m* and year *t*. An increase in RER corresponds to a real depreciation of country *i*'s currency. Data on nominal exchange rates and CPIs were obtained from the International Financial Statistics of the IMF.

We first explore the cross-section correlation between exchange rate volatility and export performance. We examine if higher exchange rate volatility is correlated with a poor export performance, and which of the two margins shows a higher degree of

[4] Between 1972 and 1988 products were classified according to a U.S. classification, which is more aggregated than the 10-digit Harmonized System used during the period 1989-2001. This could be problematic for obtaining a consistent product panel dataset, but it also can have effects on the country-specific margins that we compute using product classification. A careful inspection of the series, however, reveals no unusual or unexplained changes in the export margins between 1988 and 1989.

[5] According to Clark et al. (2004) this is the most widely measure of exchange rate volatility. Among others, it has been used by Frankel and Wei (1993), Tenreyro (2007) and Byrne, Darby and MacDonald (2008).

correlation with volatility. In the following figures the change in the extensive margin and the intensive margin between 1972 and 2001 is plotted against the average exchange rate volatility in the same period.

Figure 1 shows that there is not a strong relationship between the change in the overall share and exchange rate volatility. This is also true in Figure 2, which displays the relationship between the change in intensive margin and exchange rate volatility.[6] The most pronounced relationship seems to be present for the extensive margin. In fact, it can be seen that those countries that have been able to avoid strong exchange rate fluctuations have experienced an increase in the extensive margin (Figure 3).[7]

In the next section we exploit within-country changes over time to look at the causal relationship between exchange rate volatility and export margins. As suggested by these cross-section regressions, exchange rate fluctuations should mainly affect the extensive margin.

3. Methodology

We examine the effect of RER volatility on trade by estimating the following equation:

$$(2) \qquad \log y_{it} = \alpha_i + \beta\sigma_{i,us,t} + \gamma e_{i,us,t} + \lambda' Z_{it} + \delta_t + \varepsilon_{it},$$

[6] A cross-section regression for 92 countries indicates that the coefficient of volatility is 0.05 for the overall share and -0.13 for the intensive margin. Both parameters are, however, not significant.

[7] The coefficient of volatility is -1.64 and significant at 1%.

where y_{it} is either the overall exports share or an export margin for country *i* in period *t*, $\sigma_{i,us}$ is the RER volatility of country *i*, $e_{i,us}$ is the log of the bilateral RER, *Z* is a vector of control variables, δ_t is a vector of year dummy variables, α_i is a vector or country-specific fixed effects, and ε_{it} is an error term that may be correlated within countries but not across countries.[8] The main parameter of interest is β. If RER volatility negatively affects exports and its margins, then the estimate for β should be negative and statistically significant. But since the empirical and theoretical literature show an ambiguous effect of volatility on trade, the estimate for β may be not significant or may even be positive.

The vector *Z* includes the ratio of trade (exports plus imports of goods) to GDP as a measure of trade openness, and domestic credit to private sector as a percentage of GDP to proxy financial development. The idea is that more open economies and those with a higher financial development are able to improve export performance. We follow Hummels and Klenow (2005) and include measures of country size (the size of the labor force) and income (Per Capita GDP PPP). Both variables are expected to have a positive and significant effect on overall exports and its margins.[9] The regression also includes a dummy variable equal to one for those countries that have signed a free trade agreement (FTA) with the U.S. The dummy is defined as one for all years in which a country has had a free trade agreement with the U.S. It takes a value of zero in all other cases.

[8] As a robustness check, we have also estimated standard errors without clustering at the country level. The estimated standard errors under this procedure are, as expected, lower than the ones computed using clustering and are available upon request.

[9] These variables were taken from the World Development Indicators.

We also include the average tariff rate that the U.S. applies to each country and the average transport cost for each country. These are computed using product-specific information on duties paid and freight, respectively.[10] To obtain the average value by country we weight each product by its share in total U.S. imports. These two variables should have a negative effect on overall exports and export margins. Evidence by Debaere and Mostashari (2005) and Feenstra and Kee (2007) shows that tariff reductions increase the extensive margin of trade. Table 1 shows descriptive statistics for all variables. After eliminating all the missing data, the number of available observations is 2,602. Variables such as trade openness and financial development show a large amount of variation across observations. The dispersion of overall exports is higher than that of the intensive margin and this in turn is higher than that of the extensive margin.

A key assumption to estimate equation (2) using OLS is that the volatility of the RER is exogenous to trade. Although most papers in the literature adopt this assumption,[11] it is likely that RER volatility is endogenous. This may occur if, for example, a country implements specific policies to increase its exports or the range of products exported to the U.S., and this generates a reduction in its bilateral exchange rate volatility. Thus, the positive correlation between trade and RER volatility would make the OLS estimates to be downward biased. As argued by Tenreyro (2007), there may be also a positive bias in OLS estimates when inflationary pressures make more likely the adoption of currency pegs (or another external commitments) and also inflation tends to reduce trade through an increase in markups. In such case, trade and volatility would be

[10] The information is also available online at http://www.internationaldata.org/.

[11] Some exceptions are Frankel and Wei (1993), Broda and Romalis (2003), and Tenreyro (2007).

positively related. In order to deal with this issue, we present, in addition to the OLS estimates, results based on IV estimation. Based on the findings of previous studies, we use the annual growth rate of money supply as instrument.[12]

4. Results

Table 2 presents the basic results using OLS. Consistent with the cross-section results of Hummels and Klenow (2005), per capita GDP PPP has a positive and significant effect on the overall exports share as well as on both export margins. The estimate for the size of the labor force is positive but only significant for the intensive margin. The estimates for trade openness and financial development are all positive but only the ones for trade openness are statistically significant. Thus, more open countries tend to increase exports to the U.S. in both the extensive and the intensive margins. The FTA dummy variable is positive but not significant for the extensive margin, suggesting that U.S. free trade agreements are more likely to increase the quantity of exported products rather than the range of goods exported. The average tariff that the U.S. applies to a country has a negative and significant effect on the intensive margin only. In terms of transport cost, our results suggest that they are significant determinants of exports, both for the intensive and the extensive margins.

Regarding RER variables, our results show that the level of the RER does not have a significant effect on either overall exports or its margins. But the volatility of the

[12] Grydaki and Fountas (2008) show that money supply growth increases the variance of the exchange rate.

RER does affect negatively the overall exports. Most of the effect comes from a negative impact on the extensive margin. The estimate for RER volatility on the intensive margin is negative but not statistically significant. These results suggest that the negative effect of exchange rate volatility on trade that has been found in the literature may be the result of a negative effect of volatility on the range of products exported by a country. This paper is the first, as far as we know, to show a negative relationship between volatility and the extensive margin.

Table 3 shows the IV estimates. As seen at the bottom of the table, our instrument passes the F-test of excluded instruments (see Staiger and Stock, 1997). The last row of the table shows the R-squared of the first stage. It is clear that money growth has strong explanatory power for exchange rate volatility. The estimates for most of the control variables remain similar to the OLS estimates in terms of both magnitude and significance. The IV coefficients for the variable of interest, volatility, are negative and significant for the overall and the extensive margin, but not for the intensive margin These results confirm that exchange rate volatility is likely to negatively affect trade by reducing the range of goods exported by a country. The effects are important in economic terms, a reduction of volatility in one standard deviation (0.057) increase the overall share in 22 percent. Similarly, the extensive margin is increased in 15 percent.

We also explore differences across countries. It should be expected that exchange rate volatility would affect trade more negatively in those countries where chances of hedging against exchange rate fluctuations are lower. This could be the case of developing countries where derivative markets are less developed. To test this hypothesis we split the sample between developed countries (high-income OECD members) and

developing countries. In Table 4 we show OLS regressions for both groups of countries. It is clear from these results that volatility tends to affects similarly the overall share, but the effect on the extensive margin is larger (in absolute value) and statistically significant for developing countries. This suggests that developing countries face more difficulties in expanding the range of exported products in the presence of larger fluctuations in their currencies. Finally in Table 5, we show the IV regressions for the group of developing countries. The results confirm the negative effect of volatility on overall exports and the extensive margin.

5. Conclusions

This paper examined the effect of exchange rate volatility on trade and attempted to identify two channels by which volatility may affect trade: the effect on the quantity exported of each good (the intensive margin) and the effect on the range of goods exported (the extensive margin). Using U.S. import data for products and country of origin, we found that exchange rate volatility negatively affects trade and that most of the effect occurs through the extensive margin of exports. The results show that volatility does not affect the intensive margin of trade.

By showing, for the first time, the negative effect of volatility on the extensive margin, this paper contributes to the large literature on trade and volatility. Our results, however, show that volatility may not necessarily affect the amount of trade, but can affect the composition of trade. In fact, our evidence indicates that the range of exported products, the extensive margin, is more affected by volatility. This could have important

implications for countries trying to diversify their export basket. Policy makers should take into account that volatility can potentially make their countries more dependent on a narrower set of goods when deciding on exchange rate regimes.

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TABLE 1: Descriptive Statistics

Variable	Observations	Mean	Std. Dev.	Min.	Max.
log(Overall Exports)	2,602	-7.26	2.85	-19.47	-1.21
log(Intensive Margin)	2,602	-4.91	1.68	-11.58	-0.91
log(Extensive Margin)	2,602	-2.35	1.51	-9.84	-0.06
log(Per Capita GDP PPP)	2,602	8.36	1.10	6.04	10.39
log(Labor Force)	2,602	15.16	1.52	11.28	19.95
log(RER)	2,602	4.52	0.38	1.89	6.14
Volatility RER	2,602	0.03	0.05	0.00	1.10
Trade Openness: Trade / GDP	2,602	57.73	54.37	4.95	957.78
Financial Development: Domestic Credit / GDP	2,602	41.21	35.86	0.72	231.08
Free Trade Agreement Dummy	2,602	0.01	0.11	0.00	1.00
Average Tariff (Weighted)	2,602	0.06	0.05	0.00	0.45
Average Transport Cost (Weighted)	2,602	0.07	0.04	0.00	0.54

TABLE 2: The Effect of RER Volatility on the Intensive and Extensive Margin of Exports

	Overall Exports	Intensive	Extensive
Per Capita GDP PPP	1.525	0.858	0.667
	(5.22)**	(3.85)**	(3.47)**
Labor Force	1.156	1.056	0.100
	(1.62)	(2.98)**	(0.21)
RER	-0.079	-0.065	-0.013
	(0.45)	(0.63)	(0.12)
Volatility RER	-2.470	-0.884	-1.586
	(2.41)*	(1.41)	(3.08)**
Trade Openness	0.004	0.003	0.001
	(6.41)**	(8.84)**	(2.89)**
Financial Development	0.002	0.001	0.001
	(1.12)	(1.08)	(0.61)
Free Trade Agreement Dummy	0.591	0.477	0.115
	(3.02)**	(2.78)**	(0.68)
Average Tariff (Weighted)	-1.108	-1.654	0.545
	(0.86)	(1.83)+	(0.70)
Average Transport Cost (Weighted)	-6.229	-3.000	-3.229
	(3.29)**	(4.73)**	(2.29)*
Constant	-34.058	-24.194	-9.863
	(3.65)**	(5.03)**	(1.55)
No. Observations	2,602	2,602	2,602
R-squared	0.921	0.845	0.864

Absolute value of *t*-statistics in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%. Standard errors were clustered at the country level. Country and year fixed effects were included but not reported. Per Capita GDP PPP, Labor Force, RER are in logs.

TABLE 3: The Effect of RER Volatility on the Intensive and Extensive Margin of Exports – IV Regressions

	Overall Exports	Intensive	Extensive
Per Capita GDP PPP	1.543	0.916	0.627
	(4.84)**	(3.85)**	(2.99)**
Labor Force	1.580	1.311	0.270
	(1.69)+	(2.80)**	(0.44)
RER	-0.076	-0.082	0.006
	(0.41)	(0.74)	(0.05)
Volatility RER	-3.780	-1.093	-2.687
	(1.95)+	(1.15)	(2.58)*
Trade Openness	0.004	0.003	0.001
	(6.92)**	(9.13)**	(2.99)**
Financial Development	0.003	0.001	0.002
	(1.14)	(0.69)	(0.99)
Free Trade Agreement Dummy	0.623	0.483	0.140
	(3.33)**	(2.71)**	(0.86)
Average Tariff (Weighted)	-0.987	-1.664	0.677
	(0.71)	(1.71)+	(0.80)
Average Transport Cost (Weighted)	-6.246	-3.007	-3.239
	(3.28)**	(4.74)**	(2.28)*
Constant	-44.970	-33.766	-11.204
	(2.61)*	(3.88)**	(0.98)
No. Observations	2,302	2,302	2,302
R-squared	0.914	0.840	0.844
F-test Excluded Instruments		562.16**	
R-squared First Stage		0.356	

Absolute value of *t*-statistics in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%. Standard errors were clustered at the country level. Country and year fixed effects were included but not reported. Per Capita GDP PPP, Labor Force, RER are in logs.

TABLE 4: Effect of RER Volatility on the Intensive and Extensive Margin of Exports by Level of Income

	Developed Countries			Developing Countries		
	Overall Exports	Intensive	Extensive	Overall Exports	Intensive	Extensive
Per Capita GDP PPP	0.008	0.570	-0.562	1.564	0.877	0.687
	(0.02)	(1.15)	(1.57)	(5.10)**	(3.77)**	(3.35)**
Labor Force	-2.038	-1.903	-0.135	1.972	1.358	0.615
	(2.95)**	(2.07)+	(0.20)	(1.67)+	(2.18)*	(0.84)
RER	-0.317	-0.131	-0.186	-0.056	-0.076	0.020
	(1.50)	(0.56)	(1.44)	(0.30)	(0.68)	(0.17)
Volatility RER	-2.547	-1.726	-0.820	-2.482	-0.886	-1.596
	(2.41)*	(1.02)	(0.63)	(2.42)*	(1.41)	(3.11)**
Trade Openness	0.012	0.005	0.007	0.004	0.003	0.001
	(2.70)*	(1.21)	(2.16)*	(6.92)**	(9.12)**	(2.91)**
Financial Development	0.000	0.001	-0.001	0.004	0.002	0.002
	(0.04)	(0.51)	(0.50)	(1.32)	(1.21)	(0.82)
Free Trade Agreement Dummy	0.367	0.694	-0.327	0.766	0.479	0.287
	(4.03)**	(5.72)**	(4.42)**	(3.92)**	(1.92)+	(1.77)+
Average Tariff (Weighted)	-2.446	-1.841	-0.605	-0.932	-1.786	0.855
	(1.69)	(1.86)+	(0.72)	(0.63)	(1.74)+	(0.97)
Average Transport Cost (Weighted)	-5.604	-0.353	-5.251	-6.245	-3.058	-3.187
	(2.15)*	(0.16)	(2.52)*	(3.26)**	(4.84)**	(2.22)*
Constant	36.509	28.266	8.243	-44.227	-27.912	-16.315
	(3.06)**	(1.69)	(0.69)	(2.96)**	(3.45)**	(1.73)+
No. Observations	524	524	524	2,078	2,078	2,078
R-squared	0.989	0.967	0.943	0.900	0.817	0.825

Absolute value of *t*-statistics in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%. Standard errors were clustered at the country level. Country and year fixed effects were included but not reported. Per Capita GDP PPP, Labor Force, RER are in logs. Developed Countries: High-Income OECD countries. Developing Countries: All Others (Source: World Bank).

TABLE 5: The Effect of RER Volatility on the Intensive and Extensive Margin of Exports – IV Regressions: Developing Countries

	Overall Exports	Intensive	Extensive
Per Capita GDP PPP	1.578	0.911	0.667
	(4.80)**	(3.73)**	(3.03)**
Labor Force	1.983	1.346	0.637
	(1.67)+	(2.13)*	(0.87)
RER	-0.050	-0.082	0.032
	(0.26)	(0.73)	(0.27)
Volatility RER	-3.813	-1.160	-2.653
	(1.97)+	(1.22)	(2.53)*
Trade Openness	0.004	0.003	0.001
	(7.30)**	(9.29)**	(3.05)**
Financial Development	0.004	0.002	0.002
	(1.32)	(1.08)	(0.92)
Free Trade Agreement Dummy	0.767	0.473	0.294
	(3.73)**	(1.86)+	(1.95)+
Average Tariff (Weighted)	-0.888	-1.784	0.896
	(0.60)	(1.72)+	(1.00)
Average Transport Cost (Weighted)	-6.228	-3.034	-3.194
	(3.24)**	(4.78)**	(2.22)*
Constant	-52.475	-34.364	-18.112
	(2.40)*	(2.92)**	(1.33)
No. Observations	2,064	2,064	2,064
R-squared	0.900	0.818	0.823
F-test Excluded Instruments		505.80**	
R-squared First Stage		0.356	

Absolute value of *t*-statistics in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%. Standard errors were clustered at the country level. Country and year fixed effects were included but not reported. Per Capita GDP PPP, Labor Force, RER are in logs. Developed Countries: High-Income OECD countries. Developing Countries: All Others (Source: World Bank).

Figure 1

Overall Exports Share and Exchange Rate Volatility: 1972-2001

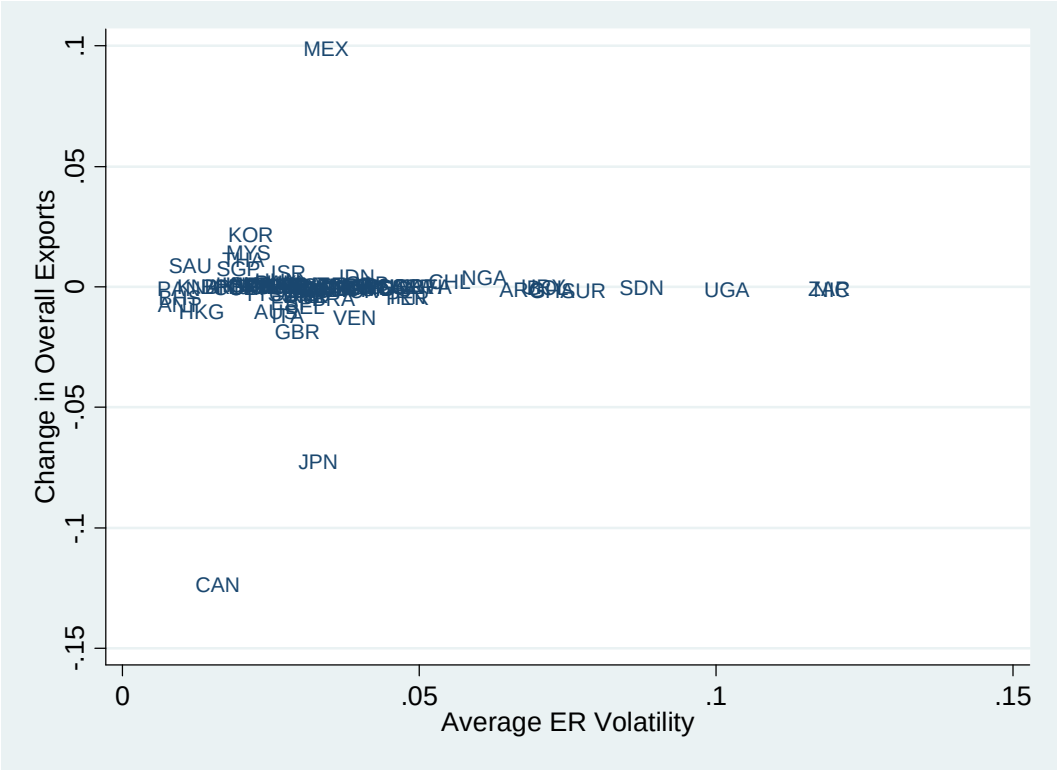


Figure 2

Intensive Margin and Exchange Rate Volatility: 1972-2001

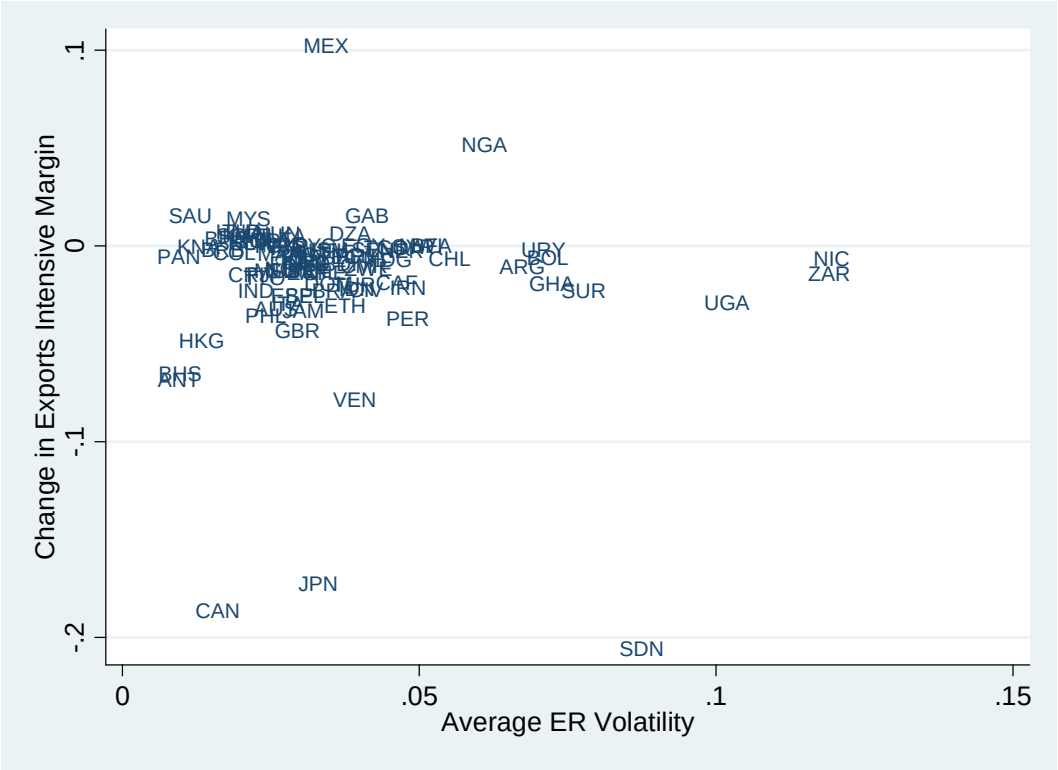
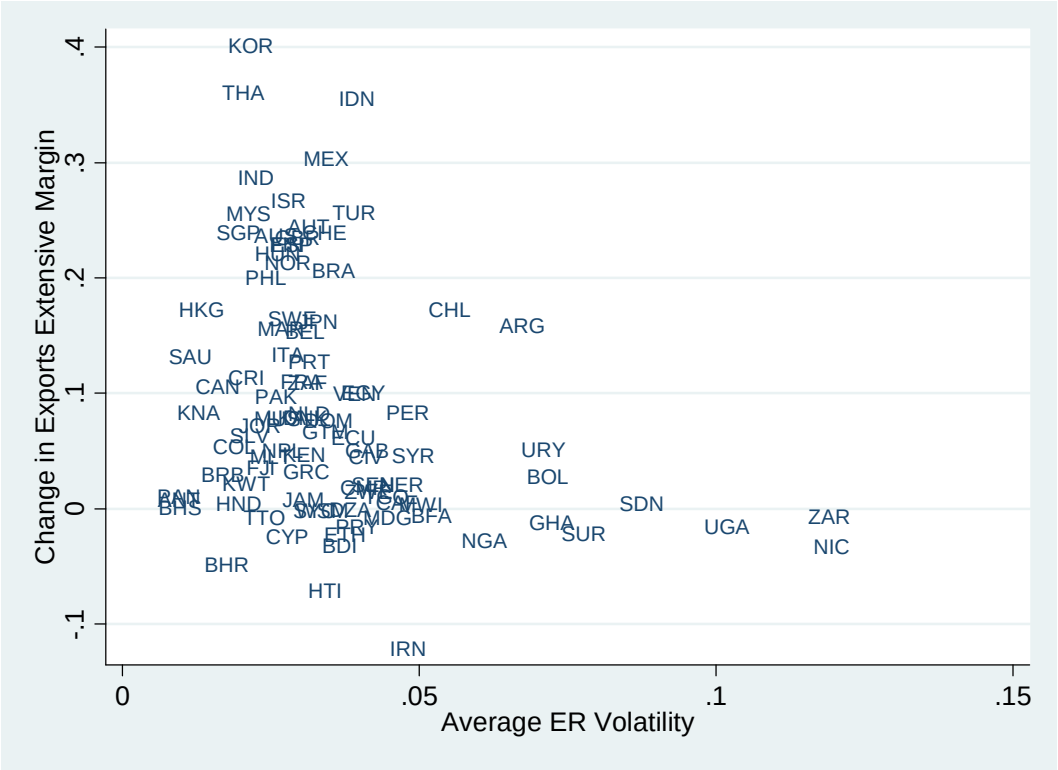


Figure 3

Extensive Margin and Exchange Rate Volatility: 1972-2001



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