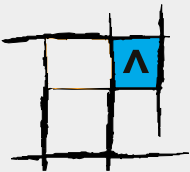




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Maurice Schiff, joint with Won Chang
**Market Presence, Contestability, and the
Terms-of-Trade Effects of Regional Integraion**



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Terms-of-Trade Effects of Regional Integration***

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Abstract

How firms react to a given shock depends on whether rivals are present and potential entrants to that market exist (i.e., whether the market is contestable). This paper attempts to measure these effects in an international context by examining the price behavior of US exporters in Brazil's market when MERCOSUR and MFN trade liberalization take place. Using very detailed panel data on trade and tariff rates, we find that *both* the preferred supplier's market presence and threat of entry *lower (raise)* the US price reaction to MFN (preferential) trade liberalization. Moreover, the *quantitative* effects of market presence and threat of entry are not significantly different from each other. It follows from these results that presence in, or threat of entry into, partners' markets implies lower optimal MFN tariffs, and regional agreements can have pro-competitive effects in contestable markets. The "symmetry" hypothesis between the effect of tariffs and exchange rates is examined as well.

Keywords: Contestable Market, Regional Integration, MERCOSUR, MFN Liberalization
JEL classification: F13; F15; C33; L1

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1. Introduction

The number of regional integration agreements (RIAs) has increased dramatically in the last decade. In fact, nearly all members of the WTO belong now to one or more RIAs. The recent proliferation of RIAs has created renewed interest in their impact on both member and non-member countries. One of the major concerns is the effect on the terms of trade faced by non-member countries. As discussed in Winters (1997), this effect should be a major focus when assessing the effect on non-member countries' welfare.

Terms-of-trade effects associated with Spain's accession to the EEC have been estimated by Winters and Chang (2000). And in their 1999 paper, Chang and Winters (henceforth CW) have shown in the case of MERCOSUR that non-member countries suffer a decline in their terms of trade and that this decline is due to their reaction to the improved market access by preferred rival competitors within the integrating market. CW have also shown that Brazil's MFN trade liberalization results in a terms-of-trade loss for Brazil and a gain for exporters to Brazil.¹

This paper extends CW's work in several ways. First, CW only include the Argentine product categories that are present in Brazil's market, and these merely cover 38% of all Argentine product categories in 1991 and 55% in 1995. We extend the empirical analysis by examining how the price response of non-member countries is affected by the presence or absence of Argentine product categories in Brazil's market. Second, the mere *threat* of entry by preferred suppliers may be sufficient to discipline non-member incumbents within a 'contestable' market. It may be reasonable to expect that when conditions facing potential Argentine entrants into Brazil's market improve,

i.e., when Brazil's market becomes more contestable for Argentine suppliers (as with RIA formation), incumbents will attempt to deter entry by reducing prices. Third, in a paper on the 'pass-through' to domestic prices of changes in tariffs and exchange rates, Feenstra (1989) has shown that the two effects should be equal. We provide an empirical test of this "symmetry" hypothesis as a check on the model.

Though contestability and issues concerning 'limit pricing' have been examined as far back as Bain (1949, 1954) and Hines (1957), they have not been studied empirically in an international setting, and certainly not in the context of regional integration.² This paper shows that trade policy changes affect incumbent suppliers, and that this effect depends on market presence and contestability.

As mentioned above, the extent to which a change in tariff or exchange rate is reflected in a change in domestic prices has been examined in Feenstra (1989).³ He assumes a foreign and a domestic firm producing a differentiated product and acting as Bertrand competitors in the US market and shows that these "pass-throughs" should be equal to each other. He finds empirical support for this "symmetry" hypothesis.⁴

The approach in this paper differs from Feenstra's in the sense that we assume two foreign firms acting as Bertrand competitors in a third market,⁵ we estimate the impact of both preferential and MFN tariff changes, and we use the entire tariff structure rather than examining selected products in detail. By using the entire tariff structure, we impose an equal price reaction across products, except for differences due to market presence and contestability.

The empirical analysis focuses on MERCOSUR where both preferential and MFN trade liberalization have taken place. As the largest economy in MERCOSUR, Brazil is

chosen as the home market. The suppliers included in the analysis are Argentina, Brazil's main trading partner in MERCOSUR, and the US, Brazil's largest non-member supplier.⁶

The paper is organized as follows. Section 2 discusses the data and Brazil's trade pattern and policies. Section 3 provides an empirical model specification. Section 4 estimates the terms-of-trade effects of MFN and preferential trade liberalization. Sub-section 4.1 examines how terms-of-trade effects are affected by market presence, Sub-section 4.2 examines how they are affected by contestability, and Sub-section 4.3 deals with tariff and exchange rate "pass-through". Section 5 concludes. The Appendix shows the effect of market presence and exchange rates, abstracting from contestability effects.

2. Trade Policies and Data

Brazil undertook unilateral reforms over 1989-1995. It liberalized most of its trade within MERCOSUR over 1991-1995, with an initial 50% cut at the end of 1991 and the rest over 1992-1995.⁷ We use detailed micro level tariff and trade data, collected at the Harmonized Tariff System (HTS) at the 6-digit level for the period 1991-1996, in order to estimate the effect of Brazil's trade policies on non-member prices.⁸ The trade data used to compute unit values were obtained from UN's Comtrade database, and the tariff data were provided by UNCTAD and the MERCOSUR Secretariat.

Table 1 is based on data reported by Brazil. It shows the main incumbents in the Brazilian market and their relative importance. The US and Argentina have the largest share of Brazil's imports in 1996, with the US share over 22%. Other suppliers such as Germany and Japan also have significant shares, though Japan's share had fallen below that of Italy by 1996. The share of the US in Brazil's imports is over 2.5 times the 8.8%

share of Germany, the second-largest non-member exporter to Brazil. As the largest exporter to Brazil, we choose to examine US pricing behavior in Brazil's market.

We also examined the importance of the various countries in Brazil's market by comparing the number of products among the HS 6-digit headings sold to Brazil by the major exporting countries that fall within a specified market share category for 1991 and 1995. Argentina was a major player within the Brazilian market, with 18.4% in 1991 and 22.6% in 1995 of the total number of product headings having 5% or more of the import share. The largest player in Brazil's market was the US, with 65% in 1991 and 70% in 1995 of the total number of headings having over 5% of the import share.

Argentina had a zero share for 62.1% of all headings in 1991 and for 44.7% in 1995, with the zero share averaging just over 50% of all headings for the 1991-1995 period. These headings were excluded from CW's analysis and are included here.

Using the disaggregated data, we can identify which products exported by the US have an Argentine rival in Brazil's market and which do not, and similarly for the threat of entry by potential Argentine exporters. We thus distinguish between four groups of products because we are interested in the reaction of non-member exporters to the presence and threat of entry of Argentine suppliers.

3. Estimating the Effect of Market Presence and Contestability

3.1. CW's estimation equations

The equations to be estimated are derived from those of CW by adding terms to capture the effects of market presence and contestability. CW develop a simple model where products are differentiated by the supplier country, as in Armington (1969), and

the export markets are segmented. Non-member country firms export to Brazil's market and to the rest of the world (ROW), and choose local currency prices (in Brazil's and in the ROW's market) to maximize their profits, taking input costs, exchange rates, tariffs, and the demand structure for the differentiated products, as given. The model assumes imperfect competition among exporters in Brazil's market, with firms taking other firms' prices as given and acting as Bertrand competitors.

The dependent variable is the US tariff-inclusive export price to Brazil in Brazil's currency deflated by the Brazilian GDP deflator, relative to the US export price to the ROW in ROW currency deflated by the ROW GDP deflator.⁹ The reason for using this relative price is to purge it from world market shocks affecting both Brazil and the ROW, and isolate the impact of Brazil's policy.¹⁰ CW's estimated reduced-form equations are:¹¹

$$\ln\left(\frac{p_1/Q_1}{p_r/Q_r}\right)_{it} = c_i + \beta_1 \ln\left[\frac{w\tau}{e_1 Q_1}\right]_{it} - \beta_2 \ln\left[\frac{w}{e_r Q_r}\right]_{it} + \delta^* \ln\left[\frac{w^* \tau^*}{e_1^* Q_1}\right]_{it} \quad (1)$$

or

$$\ln\left(\frac{p_1/Q_1}{p_r/Q_r}\right)_{it} = c_i + \alpha \ln \tau_{it} + \gamma^* \ln \tau_{it}^* + \beta_1 \ln\left[\frac{w}{e_1 Q_1}\right]_{it} - \beta_2 \ln\left[\frac{w}{e_r Q_r}\right]_{it} + \delta^* \ln\left[\frac{w^*}{e_1^* Q_1}\right]_{it} \quad (2)$$

where $p_1(p_r)$ is the non-member firm tariff-inclusive export price to Brazil (the ROW)

in the importing country's currency;

$\tau(\tau^*)$ is Brazil's tariff factor on imports from non-member (Argentina), equal to $1+t$

$(1+t^*)$, where t (t^*) is the ad valorem tariff rate;

$Q_1(Q_r)$ is the general price level of Brazil (ROW);

$e_1(e_r)$ is the US/Brazil (US/ROW) exchange rate. Similarly, e_1^* represents the bilateral

exchange rate between Argentina and Brazil; and

$w(w^*)$ is an index of non-member (Argentina) input prices in local currency.

There is no constant in equations (1) and (2) since c_i is commodity-specific. Thus, the equations provide a “within” estimation. Equation (1) estimates the pricing equation of a US firm exporting to the two segmented markets, Brazil (denoted by subscript 1) and the ROW (denoted by subscript r). Equation (1) implies that the US exporter’s tariff inclusive price (in Brazilian REAL) relative to its export price to the ROW depends on its cost of selling in Brazil’s market and of selling in the ROW, and on Argentina’s cost of selling in Brazil’s market. Equation (2) separates out the tariff factors, the main variables of interest.¹² We allow the coefficients “ α ” to differ from “ β_1 ” and “ γ^* ” to differ from “ δ^* ” in equation (2) in order to test the “symmetry” hypotheses $\alpha = \beta_1$ and $\gamma^* = \delta^*$ in Section 4.

Note that the tariffs are commodity and time varying, whereas the last three terms of equation (2)--which are essentially macroeconomic variables (exchange rate, general price level, and input price index)--are only time varying. Since the last three terms of equation (2) only vary with time, CW also estimate equation (3) which is a variant of equation (2). Equation (3) regresses the ratio of tariff inclusive prices on the tariff factors, and on yearly time dummies designed to sweep out all the common effects across the commodities over the relevant years. Equation (3) is:

$$\ln\left(\frac{P_1}{P_r}\right)_{it} = c_i + \alpha \ln \tau_{it} + \gamma^* \ln \tau_{it}^* + \text{Yearly Time Dummies} \quad (3)$$

3.2. Market presence and contestability

Estimating both equations (2) and (3) should provide an additional check on our results and add confidence in their robustness if the results are similar. We estimate a transformation of equations (2) and (3). The sample CW use includes only those non-member products with direct competition from Argentine producers. This paper extends their work by exploring the impact of Argentine presence in Brazil's market and of contestability. In order to determine whether the presence of Argentina has a significant impact, we include all the products exported by the US to Brazil, whether they have Argentine competitors or not. In other words, US products with no Argentine presence in Brazil's market are reintroduced into the universe of headings for examination.

We separate the products that the US exports into two types: first, a set of products where Brazil reports 0 or 1 year of imports from Argentina; and second, a set of products where Brazil reports 2 to 6 years of imports from Argentina. Product headings in the first set are defined as those with no Argentine presence in Brazil's market, and product headings in the second set are defined as those with Argentine presence.¹³

We further refine the analysis by examining the effects of contestability. Since there is a possibility of entry by those Argentine products that are not exported to Brazil, we examine whether there are added effects on US export pricing from threats of entry. To determine the threat of entry of a given product, we need to know whether Argentina produces it. However, at the 6-digit level of disaggregation, it is not possible to know whether Argentina actually produces the products that it does not export to Brazil.

Alternatively, we use Argentine exports to the ROW as a measure of contestability. The reason is that if Argentina exports to the ROW, it can supply Brazil's market by shifting sales from the ROW to Brazil. And even though Argentine products

exported to the ROW might not be present in Brazil's market, they may nevertheless represent a viable threat to the US in that market. And the same may also hold if Argentina is already present in Brazil's market.

Argentine export data at this level of disaggregation only start in 1993. We therefore use the ROW as reporter and examine its imports from Argentina. Brazil's market is defined as contestable if Argentina exports to the ROW for two years or more during 1991-96; otherwise, Brazil is assumed not to be contestable. Note that market presence and contestability are defined by using the same number of years. With the information on Brazil's imports and on the ROW's imports of Argentine products, we can determine which products were exported by Argentina to Brazil only, which to the ROW but *not* to Brazil, which to both markets, and which were not exported at all.¹⁴

The parameters α and γ^* become: $\alpha = b_1 D_1 D_2 + b_2 D_1 D_2' + b_3 D_1' D_2 + b_4 D_1' D_2'$, and $\gamma^* = b_1 D_1 D_2 + b_2 D_1 D_2' + b_3 D_1' D_2 + b_4 D_1' D_2'$, where $D_1 (D_1') = 1$ when Argentina is absent (present) in Brazil's market, and $D_2 (D_2') = 1$ when Argentina is absent (present) in the ROW's market. Equations (2) and (3) then become:

$$\ln \left(\frac{p_1 / Q_1}{p_r / Q_r} \right)_{it} = c_i + (b_1 D_1 D_2 + b_2 D_1 D_2' + b_3 D_1' D_2 + b_4 D_1' D_2') \ln \tau_{it} + (d_1 D_1 D_2 + d_2 D_1 D_2' + d_3 D_1' D_2 + d_4 D_1' D_2') \ln \tau_{it}^* + \beta_1 \ln \left[\frac{w}{e_1 Q_1} \right]_t - \beta_2 \ln \left[\frac{w}{e_r Q_r} \right]_t + \delta^* \ln \left[\frac{w^*}{e_1^* Q_1} \right]_t, \quad (2')$$

$$\ln \left(\frac{p_1}{p_r} \right)_{it} = c_i + (b_1 D_1 D_2 + b_2 D_1 D_2' + b_3 D_1' D_2 + b_4 D_1' D_2') \ln \tau_{it} + (d_1 D_1 D_2 + d_2 D_1 D_2' + d_3 D_1' D_2 + d_4 D_1' D_2') \ln \tau_{it}^* + \text{Yearly Time Dummies}. \quad (3')$$

4. Estimation Results

We report the main results in Table 2. The dependent variable is the tariff-inclusive real US export price to Brazil (in REALs) relative to the real US export price to the ROW (in ROW currency). Table 2 presents the effect of both market presence and contestability. The first column (column a) shows the results of estimating equation (2'), and the second column (column b) shows the results of estimating equation (3'). As shown in Table 2, the regressions are estimated with over 8,000 degrees of freedom.

Note the similarity of the US price response obtained in the two specifications (first eight rows of columns a and b), in terms of both empirical and statistical significance. And, as explained below, all the statistically significant coefficients have the right sign, including those with respect to exchange rates (rows nine and ten).

4.1. Market Presence

The effect of market presence is reported in rows 1, 3, 5 and 7. The coefficient of row 1 (no Argentine presence) is larger than that of row 3 (Argentine presence) in both specifications, and the difference is statistically significant. Also, the reduction of MFN rates seems to have been close to fully passed through to the Brazilian consumers when Argentina is present (row 3) and more than fully when Argentina is not (row 1). The results suggest that Brazil's terms of trade are unlikely to have worsened with respect to US imports following MFN liberalization.

Why are the coefficients different when Argentina is present in Brazil's market, in the absence of contestability? In the case of the MFN tariff, the price response coefficient in column a of Table 2 is 1.625 when Argentina is absent (row 1) but only .889 when

Argentina is present (row 3), and similarly for column b. This can be explained as follows. Argentina was not subject to Brazil's MFN tariff over the 1991-96 period examined when the preferential rate applied. Now, for product headings where Argentina is absent in Brazil's market, Brazil's MFN tariff reduction affects 100% of its imports. On the other hand, if Argentina has, say, a 40% import share in Brazil's market for a given product, a reduction in the MFN rate only affects 60% of imports. Thus, it should be no surprise that the MFN tariff has a significantly larger effect on US prices when Argentina is absent than when it is present.

Examining the preferential tariffs, we see that MERCOSUR lowered US export prices, though not significantly when Argentina is absent in Brazil's market (row 5). However, when Argentina is present in Brazil's market (row 7), the preferential tariff has a statistically significant effect on US export prices. The price effect--as a percent of the change in the preferential tariff factor—is about forty percent (44.7% in column a and 40.3% in column b). The presence of Argentina in Brazil's market implies a (statistically significant) greater US price response to MERCOSUR, i.e., it implies a greater US terms-of-trade loss and a greater terms-of-trade gain for Brazil.

These results make sense. Giving preferences for Argentine products that are not exported to Brazil has no impact on competitiveness in Brazil's market and should not affect other exporters' price behavior. On the other hand, preferences given to Argentine exporters who are present in Brazil's market affect competitiveness and result in lower US export prices in that market.

Thus, we conclude that market presence matters and that its impact on the US price response varies with the type of tariff under consideration. Argentine presence

implies a *smaller* price response to Brazil's MFN tariff change but a *larger* response to Brazil's preferential tariff change.

4.2. Contestability

Table 2 also examines the effect of contestability, i.e., it examines whether Argentine exports to the ROW affect US price behavior in Brazil's market. One would expect it to be easier for Argentina to increase its exports to Brazil if it already exports to the ROW, and that the related price effect would be more important if Argentina had no presence in Brazil's market. The contestability effects are reported in rows 2, 4, 6 and 8.

If Argentina is absent from Brazil's market (rows 1 and 2), a decrease in the MFN tariff makes Argentina less competitive in Brazil's market relative to its rivals in the ROW, i.e., the threat of entry when Argentina exports to the ROW becomes weaker as the MFN tariff is decreased. Therefore, the contestability effect is negative (-.720), and the US changes its price by .905 (90.5%) of the change in the MFN tariff factor (= 1.625 - .720) rather than by 1.625 (see column a). This effect does not hold when Argentina is already present in Brazil's market (rows 3 and 4), in which case Argentina exporting to the ROW has no significant effect on US pricing behavior in Brazil's market.

Examining the effects of Brazil's preferential liberalization on US pricing behavior, we see that when Argentina is not present in Brazil and does not export to the ROW (row 5), there is no statistically significant effect on US pricing behavior. However, when Argentina is not present in Brazil but does export to the ROW (row 6), the contestability effect is positive (.520) and the US changes its price by .371 (37.1%) of any change in Brazil's preferential tariff factor (.520 - .149). This indicates that US

exporters do react to preferential tariffs even when they have no current preferred competitors within the Brazilian market if Brazil's market is contestable, i.e., if US exporters face potential competitors. The opposite holds when Argentina already has a strong presence in Brazil (row 7 and 8). US exporters respond statistically significantly to a preferential tariff when Argentina is already present in Brazil's market (40-45% of any change in the preferential tariff), and Argentine exports to the ROW have no statistically significant additional effect.

As noted earlier, Argentina's presence in Brazil's market reduces the US price response to MFN tariffs and raises it with respect to preferential tariffs. Table 2 also shows that, when Argentina has *no presence* in Brazil's market, contestability also *reduces* the US price response to MFN tariffs and *raises* it with respect to preferential tariffs. If Argentina is *present* in Brazil's market, contestability has *no* significant additional effect on price response.

These results imply that regional integration may have pro-competitive effects under contestability and no market presence. If Argentina has no presence in Brazil's market both before and after MERCOSUR is formed, then the price response of US firms is larger if Argentina is present in ROW markets. In that case, MERCOSUR results in lower US prices. Lower prices imply greater consumption in Brazil's market, and since Argentina is not present, it implies a larger volume of imports by Brazil from US firms selling more at a lower price and earning smaller rents. Thus, our results suggest that if, for some product headings, countries are absent from each others' markets, contestability implies that regional integration between these countries has pro-competitive effects, with greater exports by and lower prices for non-members, and lower consumer prices

and greater consumption in member countries. In those circumstances, regional integration results in a type of “trade creation”, not between member countries, but by raising Brazil’s imports from non-member countries.

We now compare the case of presence and no contestability, with that of no presence plus contestability. For the MFN tariff, the effect of presence and no contestability is .889 (row 3, column a) and the effect of no presence plus contestability is .905 (rows 1 + 2). For preferential tariffs, these effects are .447 (row 7) and .371 (rows 5+6), respectively. Both for MFN and preferential tariffs, the US price reaction is similar and not statistically different when Argentina is present in Brazil’s market but no threat of entry exists, and when Argentina is absent from Brazil’s market but the threat of entry exists.

That presence and threat of presence have qualitatively similar effects comes as no surprise. What is surprising is that their *quantitative* impact are found not to be statistically different either.

4.3. Tariff and Exchange Rate Pass-Through

The price effects of the exchange rates between the US currency and those of Brazil and of the ROW are shown in Table 2 by the estimates of β_1 (row 9) and β_2 (row 10), respectively, and the effect of the exchange rate between the currencies of Argentina and Brazil is indicated by the estimate of δ^* in row 11. These effects are averages over all product headings, whether with or without Argentine presence in Brazil’s and the ROW’s markets. The weighted average of the US price response to the MFN tariff change over

all tariff headings is 1.123, not significantly different from $\beta_1 = 1.260$. Thus, the “symmetry” hypothesis cannot be rejected for the MFN tariff.

The effect β_2 of a change in the ROW/US exchange rate is negative (-1.027) and significant, and of similar absolute value as β_1 , with $(\beta_1 + \beta_2)$ not significantly different from zero. This is as expected since the numerator of the dependent variable is in Brazil’s currency while the denominator is in the ROW’s currency. Another reason is that the index of non-member input prices w appears both in the term with β_1 and with β_2 , and since changes in w should not affect the relative price, one would expect $\beta_1 + \beta_2 = 0$. The effect δ^* of a change in the Brazil/Argentina exchange rate is not significant. Thus, the “symmetry” hypothesis does not hold between that exchange rate and the preferential tariff rate.

Feenstra’s estimation covers the period 1974-1987 when the US had not yet formed RIAs with Canada or Mexico. This is not true in our case where the period of analysis is 1991-1996 when MERCOSUR was in place and where MFN tariff changes only applied to non-MERCOSUR sources. To cover all sources of imports, as in Feenstra, we must consider both MFN and preferential tariff changes. In other words, we need to compare $(\beta_1 + \delta^*)$, which measures the effect of a change in both the Brazil/US and the Brazil/Argentina exchange rates, to the average effect of the sum of MFN and preferential trade liberalization.

The effect of the two exchange rates $\beta_1 + \delta^* = 1.155$ is not significantly different from the weighted average of the effect of MFN and preferential tariffs (1.354). The “symmetry” hypothesis between the pass-through of tariffs and exchange rates cannot be rejected.¹⁵

Feenstra (1989) confirmed the “symmetry” hypothesis for US imports of compact trucks and heavy motorcycles from Japan in the case of MFN tariffs. Our analysis indicates that the “symmetry” hypothesis holds for Brazilian imports from the US for MFN tariffs, for MFN and preferential tariffs taken together, but not for preferential tariffs alone.

5. Conclusion

Using detailed price and tariff panel data, this paper examines the impact of market presence and contestability on US price response to Brazil’s MFN and preferential trade liberalization. Our analysis provides evidence to support the idea that presence by a member country does make a difference in non-member pricing behavior. We show that Argentina’s presence in Brazil’s market results in a smaller US price response to Brazil’s MFN tariff change and in a larger response to a preferential tariff change.

As for contestability, we find that it plays no significant role when Argentina is present in Brazil’s market. When Argentina is absent from Brazil’s market, contestability lowers the US price response to changes in the MFN tariff and raises it with respect to changes in the preferential tariff. And the effect of market presence on the US price response to both MFN and preferential liberalization is not statistically different from the effect of contestability when there is no market presence. Thus, presence matters, whether actual or potential. In the case of no market presence, regional integration is likely to have pro-competitive effects.

Our results on the “symmetry” hypothesis between the price effect of exchange rates and tariff rates in the case of Brazil tend to support Feenstra’s results for the US both for MFN tariffs and for the sum of MFN and preferential tariffs, but not for preferential tariffs alone.

From the above, it follows that: i) in the absence of contestability, presence of member countries in each others’ markets implies a lower optimal MFN tariff because it reduces the terms-of-trade loss from lowering MFN trade barriers; ii) it raises the terms-of-trade gain from forming a trade bloc but has an ambiguous impact on the welfare effect of bloc formation because, though the terms-of-trade gains are larger, the trade volume on which these gains are obtained is smaller; and iii) contestability and absence in the partner’s market has a positive impact on the welfare effect of bloc formation and has general pro-competitive effects.

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Table 1: Brazil's import values and shares in 1991 and 1996 from major trading partners

Country	1991		1996	
	\$ bil.	share%	\$ bil.	share%
Argentina	1.75	7.6	7.09	12.6
Canada	0.59	2.5	1.38	2.4
Chile	0.53	2.3	1.00	1.8
China	0.08	0.3	1.25	2.2
France	0.65	2.8	1.41	2.5
UK	0.49	2.1	1.32	2.3
Germany	2.03	8.8	4.97	8.8
Italy	0.85	3.7	3.06	5.4
Japan	1.35	5.9	2.90	5.1
Korea	0.15	0.6	1.25	2.2
Mexico	0.23	1.0	1.02	1.8
USA	5.40	23.5	12.56	22.2
Total	14.07	61.2	39.19	69.4
World	\$22.98	100.0	\$56.47	100.0

Table 2: The Impact of Market Presence¹ and Contestability² on the Price of US Exports to Brazil³ (Estimation of Equations (2') and (3')).

		a = Equation (2')		b = Equation (3')	
		Coefficient	Standard Error	Coefficient	Standard Error
MFN ⁴	No presence ¹	1.625	0.19	1.634	0.20
	Contestability ²	-0.720	0.30	-0.721	0.31
	Presence	0.889	0.32	0.944	0.32
	Contestability ²	0.249	0.33	0.263	0.33
RIA ⁵	No presence ¹	-0.149	0.17	-0.186	0.17
	Contestability ²	0.520	0.23	0.543	0.23
	Presence ¹	0.447	0.23	0.403	0.23
	Contestability ²	-0.257	0.23	-0.262	0.23
ER ⁶	β_1 Brazil/US	1.260	0.13		
	β_2 ROW/US	-1.027	0.21		
	δ^* Brazil/Arg	-0.105	0.14		
	Time Dummies	No		Yes	
	R²	0.578		0.178	
	EDF	8159		8156	

1. "Presence" ("No Presence") represents the effect of the presence (no presence) of Argentine exports to Brazil;
2. "Contestability" represents the added effect of Argentine exports to the ROW;
3. "Price of US Exports to Brazil", the dependent variable, is the price of US exports to Brazil in Brazil's currency divided by Brazil's GDP deflator, relative to the price of US exports to the ROW divided by the ROW's GDP deflator;
4. "MFN" represents the effect of changes in Brazil's non-preferential tariff;
5. "RIA" represents the effect of changes in Brazil's preferential tariff to Argentina;
6. ER = represents the effect of changes in various exchange rates.

Appendix

This appendix abstracts from contestability effects and present the effects of market presence. Analytically, we modify equations (2) and (3), with parameters α and γ^* equal to : $\alpha = b_1 D_1 + b_1' D_1'$ and $\gamma^* = d_1 D_1 + d_1' D_1'$, where D_1 and D_1' are defined in equation (2'). The modified equations (2) and (3) are shown as equations (2A) and (3A) below. The empirical results are shown in Table A1 and generally support those of Table 2.

$$\ln\left(\frac{p_1/Q_1}{p_r/Q_r}\right)_{it} = c_i + (e_1 D_1 + e_1' D_1') \ln \tau_{it} + (f_1 D_1 + f_1' D_1') \ln \tau_{it}^* + \beta_1 \ln\left[\frac{w}{e_1 Q_1}\right]_t - \beta_2 \ln\left[\frac{w}{e_r Q_r}\right]_t + \delta^* \ln\left[\frac{w^*}{e_1^* Q_1}\right]_t, \quad (2A)$$

$$\ln\left(\frac{p_1}{p_r}\right)_{it} = c_i + (e_1 D_1 + e_1' D_1') \ln \tau_{it} + (f_1 D_1 + f_1' D_1') \ln \tau_{it}^* + \text{Yearly Time Dummies} \quad (3A)$$

Table A1: The Impact of Market Presence¹ on the Price of US Exports²

		a = Equation (A2)		B	
		Coefficient	Standard Error	Coefficient	Standard Error
MFN³	No Presence (e_1)	1.281	0.14	1.277	0.15
	Presence (e_1')	1.116	0.09	1.174	0.10
RIA⁴	No Presence(f_1)	0.156	0.13	0.130	0.13
	Presence (f_1')	0.222	0.08	0.178	0.09
ER⁵	Brazil/US (β_1)	1.222	0.13		
	ROW/US (β_2)	-0.994	0.21		
	Brazil/Arg (δ^*)	-0.064	0.14		
	Time Dummies	NO		YES	

R²		0.577	0.174
EDF		8163	8160
e₁ = e'₁	prob>F	0.323	0.554
	F	0.980	0.350
f₁ = f'₁	prob>F	0.618	0.715
	F	0.250	0.350

-
1. "Presence" ("No Presence") represents the effect of the presence (no presence) of Argentine exports to Brazil;
 2. "Price of US Exports", the dependent variable, is the price of US exports to Brazil in Brazil's currency divided by Brazil's GDP deflator, relative to the price of US exports to the ROW divided by the ROW's GDP deflator;
 3. "MFN" represents the effect of changes in Brazil's non-preferential tariff;
 4. "RIA" represents the effect of changes in Brazil's preferential tariff to Argentina;
 5. ER = represents the effect of changes in various exchange rates.

Endnotes

¹ Ashenfelter et al. (1998) employ a similar pricing methodology in a domestic context for two firms as marginal costs change in a single firm and for the industry. In particular, they regress the price one firm, Staples, charges for a product on the marginal cost of that product as well as on the cost of Office Depot, another rival firm in the industry.

² Baumol et al. (1988) offer a general exposition on the market behavior of incumbent firms and the threat of entry. They argue that markets may in fact be ‘perfectly contestable’, in which case price cannot be above average cost.

³ For an extensive survey of the literature on exchange rate “pass-through”, see Goldberg and Knetter (1997). They state that a 50% exchange rate “pass-through” is about average for the estimated responses for shipments to the US. They also examine the “symmetry” hypothesis.

⁴ For more on these issues, see also Feenstra (1995).

⁵ See also Helpman and Krugman (1989) for a use of this approach.

⁶ Paraguay and Uruguay, the two smaller partners in MERCOSUR, were not included in the analysis due to data limitations.

⁷ MERCOSUR’s internal liberalization was started in late 1991 with the signing of the Treaty of Asunción. The members initially planned a full Customs Union by the start of 1995 but due to political pressures from within, this was not fully achieved. By late 1994, after much contention, the Ouro Preto Protocol was signed. It allowed countries to exclude certain products from internal free trade and implemented the Common External Tariff (CET) for most product headings. All countries were allowed exceptions, Brazil 28 out of approximately 5000 HS-6 headings from internal free trade—see CW and Olarreaga and Soloaga (1998) for details on the transition of these tariff rates.

⁸ The data themselves are more detailed than 6-digits, but these are country specific and comparing products across countries at that level is not possible.

⁹ The export prices are unit values. These were calculated using the UN’s Comtrade database at the Harmonized System (HS) 6-digit level. HS 6-digit data are very disaggregated, and this helps limit heterogeneity within each product heading and improve the quality of the unit value data used here. All tariffs are ad valorem rates charged on the c.i.f. value of imports.

¹⁰ One would expect this relative price to fall for non-members with the creation of MERCOSUR, and to rise for members. The relative price, averaged over all tariff headings, decreased by some 16% for the US over 1991-1996 and increased by some 4% for Argentina for 1993-1996 (data for 1991-1992 at this level of disaggregation are missing for Argentina).

¹¹ See CW for the model and derivation of the reduced-form equations.

¹² The tariff factor for the rest of the world is assumed to be constant and is not included in equations (1) and (2).

¹³ In CW’s paper, products are included if they are exported to Brazil for at least three years by Argentina and non-member countries.

¹⁴ The data have been organized in such a way that presence either prevails (for 2 to 6 years of exports to Brazil) or not (0 to 1 year), and similarly for contestability. Alternatively, we defined presence and contestability in an incremental way. We constructed a dummy variable that takes values from 0 to 6 to reflect the number of years of Argentine exports to Brazil or the ROW. In that case, the estimated coefficients measure the impact on US pricing of an additional year of Argentine exports. Estimation results in this case were not satisfactory, indicating that US price reactions are not significantly affected by marginal changes in Argentina's export behavior.

¹⁵ Note that the hypothesis of complete "pass through" (equal to one) is verified for the MFN tariff in the case of Argentine presence, but the "pass through" is larger than one in the case where Argentina is not present, a somewhat surprising though possible result in a strategic framework.