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# **Trade Liberalization, Tariff Redundancy, and Inflation**

## **A Methodological Exploration Applied to Argentina**

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# Trade Liberalization, Tariff Redundancy and Inflation: A Methodological Exploration Applied to Argentina

By

Jan Peter Wogart and Jose Silverio Marques

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Contents: I. Introduction. - II. Theoretical Considerations, Definitions and Methodology. - III. Empirical Results. - IV. Qualifications and Impact on Inflation. - V. The Impact of the Program on Output and Employment Growth. - VI. Summary and Conclusions. - Appendix.

## I. Introduction

Inflation and protection have been salient features of many semi-industrialized nations. Since the former problem, however, was thought to be mainly a fiscal and monetary phenomenon, most post-war stabilization efforts have been of a demand-reducing character. While external sector policies were part and parcel of many orthodox anti-inflationary programs, stabilization of the balance of payments was often in conflict with stabilization of domestic prices. It has been only in the last few years that attempts have been undertaken to explicitly use the liberalization of goods and factor markets both, in the external and domestic sectors of the economy, to solve short-term inflationary and long-term resource-allocation problems.

The monetary stabilization-cum-trade-liberalization approach was introduced almost simultaneously in Chile, Argentina and Uruguay in 1978/1979. In its Argentine version the external sector program consisted of (a) the elimination of direct controls on trade and capital flows; (b) the gradual lowering of import tariffs and fees; and most importantly, (c) an "active" crawling peg, i.e., a prefixed schedule of decelerating exchange rate devaluations over a certain period of time<sup>1</sup>. This latter policy had the two-fold purpose of indicating the authorities' target rate of inflation and relieving the Central Bank of exercising a restrictive monetary policy, which so often had

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*Remark:* The views expressed in this paper are those of the authors and should not be attributed to the World Bank, the organization with which they are associated. The authors wish to thank Gerald Alter for discussing and shaping many of the ideas of this essay. For helpful comments thanks go to Julio Nogues, Guillermo Nielsen and Mario Blejer.

<sup>1</sup> The crawling peg has been a tool to maintain international competitiveness in some Latin American countries for several years (especially Brazil and Colombia). However, the adjustments are undertaken *ex-post*. In contrast, the exchange rate adjustments in Argentina and Uruguay were made *ex-ante*. For a discussion of the "active" crawling peg, see McKinnon [1980].

led to serious recession. The liberalization measures in the external sector were accompanied by a liberalization of the domestic factor markets, especially by the removal of controls on interest rates.

When the Southern Cone countries of Latin America used the monetary-stabilization-cum-trade-liberalization approach to simultaneously lower inflation and improve resource allocation in the late 1970s, economists were reluctant to plunge into an area which formerly comprised three different bodies of literature relating to: (1) causes and consequences of inflation; (2) trade regimes and optimal trade policies; and (3) determinants of economic growth. An elementary framework for analyzing the relationship between trade regimes and monetary macro-aggregates was undertaken by Anne Krueger [1981]<sup>1</sup>. That framework, however, does not offer an analysis of the possible price-stabilizing impact of a trade liberalization program consisting of decelerated devaluation and tariff reductions. Since most industries in the semi-industrialized countries enjoy high levels of tariff protection, part of which they never need nor use, one crucial aspect of this type of program is for the policymaker to know at what point foreign competition can be expected to prevent domestic entrepreneurs from raising their prices indiscriminately.

This paper is concerned with a particular issue which arises during the implementation of an anti-inflation-cum-trade-liberalization program, i.e., the elimination of "water in external tariffs" or tariff redundancy of a number of manufactured goods; discussed are its measurement and its implications for domestic inflation, economic growth in industrial output and employment and resource allocation. Empirical data of forty branches of the Argentine manufacturing sector are used here, but emphasis is placed on developing a simple, workable framework which can also be applied to the relevant data available in other countries. In Section II, we present the theoretical underpinnings together with some definitions and methodological considerations. Section III contains the empirical results. In Section IV we introduce some qualifications to the simple model. Section V analyzes the implications of the Argentine trade liberalization measures upon major macro economic variables, and this analysis is followed in Section VI by a short summary and conclusions.

## II. Theoretical Considerations, Definitions and Methodology

For the stabilization attempts in the three Latin American countries of the Southern Cone to function effectively, some crucial assumptions concerning the monetary approach to the balance of payments and the Purchasing Power

<sup>1</sup> Since then, a number of further investigations of both theoretical and empirical nature have attempted to throw some light on the interaction between trade liberalization and domestic inflation [see Corbo, 1982; Fernandez, Rodriguez, 1982; Harberger, 1982; Nogues, 1983 a].

Parity (PPP) theory had to be sound. The PPP theory maintains that, in a world of zero or constant transport costs and no trade barriers or of pure ad valorem tariffs, international commodity arbitrage will ensure equality of domestic and international prices. Whatever the disequilibrium had been before, the Law of One Price would ensure the adjustment of domestic to international prices. The monetary approach to the balance of payments postulates that, once capital and money markets are liberalized, policymakers can determine either the exchange rate or the money supply, but not both. If the authorities opt to fix the exchange rate, as they did in the Southern Cone countries, any current account surplus or deficit will cause an opposite effect on international capital flows<sup>1</sup>. Excess domestic demand will not increase prices but imports, which, in turn, will generate capital inflows, either directly through trade credits or, if payments are made in cash, by increased demand for money, which will cause interest rates to rise and thus will induce foreign capital to enter. While simple enough in theory, the real issue for the policymaker is to identify those products for which possible excess demand will spill over into the balance of payments and estimate how rapidly actual lower priced imports will have a stabilizing effect on domestic inflation. The analysis of tariff redundancy is a crucial element in looking for an answer to those questions.

Tariff redundancy is the difference between nominal protection from foreign competition and protection actually used, where "nominal" or "legal" protection is the sum of a nominal tariff and other fees, including quantitative restrictions (QRs), applied to imports, and "used" protection is the difference between the price of an item produced locally and the price of the imported product that competes with it. While "used" protection is normally less than "legal" protection, tariff redundancy can take either positive, zero or negative values. It can also be expressed as a ratio, in which case it can be called the rate of convergence between domestic and international prices.

Consider a homogeneous product that is both produced locally and imported. Let  $p_t^d$  be its ex-factory domestic price, and  $p_t^i$  its import price (ex-port of destination) expressed in foreign currency, both at period  $t$ . If  $r$  is the foreign exchange rate,  $p_t^i \cdot r$  equals  $p_t^d$  in a world of perfect competition, zero tariff and non-tariff barriers, and equal domestic transportation costs and margins. Let  $T_t$  stand for the rate of protection, which is the sum of nominal external tariff ( $g_t$ ) and import fees ( $f_t$ ), both expressed in percentage

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<sup>1</sup> In the case of Argentina and Uruguay, the exchange rate was actually not fixed but pre-announced. The effect on interest rates and other variables is, however, the same as in the case of fixed exchange rates. For a discussion, see McKinnon [1980] and Williamson [1981].

terms of the CIF value<sup>1</sup>. If  $p_t^c$  is the competing price of the imported good expressed in foreign currency<sup>2</sup>, then by definition, tariff redundancy  $R_t$  and rate of convergence  $RC_t$  at period  $t$  are given by the following relationships:

$$R_t = (1 + T_t) - (1 + P_t) \tag{1}$$

$$RC_t = (1 + T_t) / (1 + P_t) \tag{2}$$

where  $T_t = g_t + f_t$  and  $P_t = (p_t^d / p_t^c \cdot r) - 1$

With  $R$  being either greater or smaller than zero, or equal to zero, redundancy will be positive, negative, or zero, respectively. When  $RC_t$  is equal to one, convergence has been achieved. For the policymaker it is important to know when this point is reached, since it indicates that domestic import-competing producers are pricing their products just at the level warranted by the given protection and exchange rate levels.

The values of the variables in equations (1) or (2) in the initial period  $t = 0$  should be calculated on the basis of direct price information obtained from business firms; it is possible to estimate the rate of convergence at period  $t = i$  ( $RC_i$ ), even if  $P_i$  is unknown. Under this condition,  $RC_i$  can be approximated by the following equation:

$$RC_i = (1 + T_i) \left/ (1 + P_0) \frac{(1 + \dot{p}^d)}{(1 + \dot{p}^c)(1 + \dot{r})} \right. \tag{3}$$

where

$\dot{r} = \Delta r / r_0 =$  percentage change in the exchange rate between  $t = 0$  and  $t = i$ ,

$\dot{p}^c = \Delta p^c / p_0^c =$  percentage change in CIF prices expressed in foreign currency, and

$\dot{p}^d = \Delta p^d / p_0^d =$  percentage change in domestic price.

Changes in the rate of convergence between two periods can be explained by changes in  $T$ ,  $\dot{p}^d$ ,  $\dot{p}^c$  and  $r$ . In order to approximate the relative importance of each factor in explaining changes in the rate of convergence, equation (4) is used:

$$\frac{RC_i}{RC_0} = \frac{(1 + T_i)(1 + \dot{p}^c)(1 + \dot{r})}{(1 + P_0)(1 + \dot{p}^d)} \left/ \frac{(1 + T_0)}{(1 + P_0)} \right. \tag{4}$$

Transforming equation (4) by using natural logarithms leads to:

$$\ln RC_i - \ln RC_0 = \ln [(1 + \dot{r})(1 + \dot{p}^c)] + \ln (1 + \dot{T}) - \ln (1 + \dot{p}^d) \tag{5}$$

where  $\dot{T} = (T_i - T_0) / (1 + T_0)$

<sup>1</sup> In Argentina, these fees consisted of a freight tax, as well as bank, port and dispatch costs, and a statistical tax until 1980. There were also taxes on specific products such as those on forestry yields and mineral extractions.

<sup>2</sup>  $p_t^c \cdot r = p_t^d \cdot r / (1 + T_t)$

Whereas the first three terms on the right-hand side of equation (5) reflect the changes in the exchange rate, international prices, and external tariffs, all of which increase redundancy if positive, the last item represents the effect of domestic price changes, which reduces redundancy if positive.

Once the rates of convergence have been computed for individual goods, it is useful to aggregate the results. The choice of the weights for the aggregation of individual industries depends upon the objectives of the analysis. If the main purpose is to assess the impact of the elimination of overall redundancy on domestic inflation, the weights of a price indicator, e.g., the wholesale price index (WPI) should be used. If, on the other hand, policymakers are more interested in analyzing the impact on output, growth, and employment, the contribution to industrial value added of the individual subsectors should be used. Since policymaking implications are important in either case, both methods will be used here.

### III. Empirical Results

The tariff redundancy estimates, which are tabulated in the Appendix, are based upon direct price comparisons between Argentine and other countries' internationally traded industrial products<sup>1</sup>. The base period is June 1977, and two estimations of tariff redundancy as of January and August 1979 were performed for forty product groups. Consider, for instance, the first item in the table, yarn. The values for tariff redundancy  $R_i$  and rate of convergence  $RC_i$  in June 1977 were computed by using equations (1) and (2) as follows:

$$R_o = (1 + .84) - (1 + .14) = .70$$

$$RC_o = (1 + .84)/(1 + .14) = 1.61$$

where  $1 + P_o = 1 + .14$  and  $1 + T_o = 1 + .84$

Price ratios for January 1979 ( $P_1$ ) were estimated by using equation (3), where  $t = 170$  percent is the rate of peso devaluation against the U.S. dollar,  $p^c = 2.1$  percent is the price increase of yarn as approximated by the U.S. producer prices, and  $p^d = 456$  percent is the price increase of yarn as given by the Argentine wholesale price index. The rate of protection for the base period and for the two estimation periods appear in Columns (4), (10) and (16). During the first semester of 1979, yarn and a number of other industrial products were subject to temporary tariff cuts<sup>2</sup>; the corresponding values for the rate of protection, tariff redundancy, and rate of convergence are shown in parentheses under Columns (16)-(18).

<sup>1</sup> The base period data were obtained from a direct price survey undertaken by a team of economic researchers at the Central Bank of Argentina in March 1977 [see Berlinski, 1977]. They were adjusted for June 1977 by the Secretariat of Commerce because they had been held artificially low by previous wage and price controls, which were abandoned subsequently.

<sup>2</sup> The temporary tariff cuts were implemented in cases in which manufacturers set their price increases substantially above the target rate indicated by the prefixed monthly rate of devaluation.

In June 1977, tariff redundancy was positive and relatively high for all forty product groups included in the sample. Transport equipment, metal products and non-metallic minerals revealed the highest tariff redundancy, whereas paper products, scientific equipment and basic metals had the lowest. Two years later, in January 1979, the picture had changed substantially, with 22 out of the 40 products experiencing "negative" redundancy, implying that domestic producers had priced their products at a level above that warranted by the exchange rate devaluation, changes in international prices and changes in the protection level. Specifically, it implies that imported products, still disregarding domestic transport costs and margins, could have been sold in the Argentine market at prices below those of their domestic competitors<sup>1</sup>. In the case of yarn, for example, given a level of protection of 68 percent, the relative price of domestic yarn would have had to decrease by 27 percent (1 - .73; Column (12) of Appendix table) to be at the level of the "theoretical"

Table 1 - *Argentina: Rates of Convergence of Major Manufacturing Subsectors*

	june 1977	January 1979	August 1979	Weights <sup>a</sup> according to	
				WPI	VA
Textiles .....	1.69	.92	.68	30.2	11.4
Clothing .....	1.20	.43	.38	7.2	1.9
Paper & pulp .....	1.59	.89	.70	4.1	3.6
Chemical substances .....	1.61	.83	.77	3.5	7.7
Other chemicals .....	2.50	.95	.74	4.1	9.9
Rubber products .....	2.00	1.19	1.01	2.2	2.4
Glass & glassware .....	2.27	.70	.58	3.2	1.0
Cement and other non-metallic minerals .....	2.13	.79	.52	3.4	4.4
Iron & steel .....	1.45	1.14	1.06	5.9	8.6
Non-ferrous metals .....	1.72	1.01	.72	3.6	0.9
Metal products .....	2.44	1.41	1.01	12.9	7.6
Non-electric machinery .....	1.56	1.30	1.05	5.1	12.5
Electrical machinery and apparatus .....	1.69	.97	.72	9.3	6.0
Transport equipment and vehicles .....	2.08	1.79	1.52	5.1	21.9
Scientific equipment .....	1.35	.69	.56	.2	.4
Total (WPI weights) .....	1.79	.90	.72	100	-
Total (VA weights) .....	1.81	1.09	.87	-	100

<sup>a</sup> WPI = Index of wholesale prices. VA = Value added.

Source: Computed from table in Appendix. - Value added weights from Central Bank [1979].

<sup>1</sup> The reasons why this could happen are explored in Section IV.

imported good price, inclusive of tariff and import fees. Tariff redundancy was further reduced by August of 1979, with only 10 product groups revealing positive redundancy (two of them nearly achieving convergence) and 30 experiencing negative redundancy.

Table 1 shows the aggregated rates of convergence for the three periods and 15 industrial subsectors, using the weights of the WPI and industrial value added. Both aggregations show a similar decline in redundancy. In August 1979, the WPI aggregation shows an overall negative redundancy of 28 percent ( $1 - .72$ ). This means that there were strong pressures for industrial product prices to come down, once imports would be allowed to enter without administrative delay. If one considers that these industries have a weight in the WPI of roughly 50 percent, the elimination of negative tariff redundancy could have been expected to reduce the domestic inflation rate by roughly 10 percentage points below the convergence rate with international inflation<sup>1</sup>.

Table 2 - Argentina: Rates of Convergence, Basic Statistics

	June 1977	January 1979	August 1979 <sup>a</sup>
Simple mean			
full sample .....	1.86	1.04	0.86 (0.83)
adjusted sample <sup>b</sup> .....	1.86	1.03	0.84 (0.80)
Standard deviation			
full sample .....	0.44	0.31	0.32 (0.32)
adjusted sample <sup>b</sup> .....	0.40	0.27	0.25 (0.26)
Maximum value			
full sample .....	2.85	1.85	2.00 (2.00)
adjusted sample <sup>b</sup> .....	2.81	1.77	1.52 (1.52)
Minimum value			
full sample .....	1.10	0.43	0.38 (0.38)
adjusted sample <sup>b</sup> .....	1.23	0.65	0.51 (0.40)
Range			
full sample .....	1.75	1.42	1.62 (1.62)
adjusted sample <sup>b</sup> .....	1.58	1.12	1.01 (1.12)
<sup>a</sup> Data in parentheses take into consideration temporary tariff cuts. - <sup>b</sup> Extreme values are eliminated from full sample.			

Source: Table in Appendix.

<sup>1</sup> This is a rough estimate, since the aggregated weights as well as the selection of one commodity as representative of each industry hide expected diverse behavior of commodity prices within each group.

Table 2 presents the means and measures of variations for rates of convergence. The simple means of the rates of convergence were 1.86, 1.04 and 0.86 percent in June 1977, January 1979 and August 1979 respectively. The measures of dispersion indicate that the variation of the convergence rates decreased between June 1977 and January 1979, but increased slightly afterwards. The standard deviation declined from .44 in June 1977 to .31 in January 1979 and increased slightly to .32 in August 1979. The range followed similar trends, declining from 1.75 to 1.42 and then rising to 1.62 percent, respectively. Both the standard deviation and the range continued to fall, however, only slightly after extreme values were excluded<sup>1</sup>. The implications of the 1977-1979 decrease in the variation of the redundancy of rates are twofold: First, it shows that the elimination of redundancy was affecting industries in a rather even fashion and, therefore, promoting foreign competition across most industrial sectors until January 1979, when it seemed that overall tariff redundancy had been eliminated; and second, during the first semester of 1979, the trend of diminishing differences among the industries affected by the liberalization measures was practically halted; temporary tariff cuts for individual products may have been partly responsible for this change.

An assessment of the relative importance of the four factors influencing the rate of convergence was made for fourteen product groups which showed the greatest decline in redundancy between June 1977 and January 1979. Equation (5) above was used in the exercise, and Table 3 reports the results<sup>2</sup>. As mentioned, decreases in the rate of protection and/or increases in domestic prices reduce redundancy and lead to convergence, whereas increases in international prices and/or exchange rate devaluation increase redundancy. Column (1) in Table 3 shows the difference between the natural logarithm of the rate of convergence of January 1979 and that of June 1977. This difference is roughly equal to the sum of the logarithm of domestic price increase (Column(2)) and the logarithm of the rate of protection (Column (5)), minus the logarithm of the changes in the exchange rate and international prices (Columns (3) and (4))<sup>3</sup>.

One important issue is to compare the impact of tariff cuts versus the nominal devaluation of the exchange rate on the rate of convergence. As becomes apparent from Columns (4) and (5), the reduction of external tariffs and its impact on reducing the domestic-international price differential was more than compensated by the rate of devaluation. However, in order to

<sup>1</sup> Because of the relatively small domestic price increase of tanning materials, redundancy remained positive for this item through 1979 (see table in the Appendix).

<sup>2</sup> All the values in equation (5) were multiplied by minus one, since there was a decrease in redundancy.

<sup>3</sup> Due to rounding, the sum may not equal the total. Note that the logarithm of the rate of protection is negative, explaining why it appears as an additive term.

Table 3 - Argentina: Relative Importance of Factors Explaining Changes in Redundancy Levels Between June 1977 and January 1979

Selected Subsectors	Difference in Conver- gence Rates	Change in		Exchange Rate Devalua- tion	Change in Protection Level	(1)-(3)	e <sup>(6)</sup>	$\Delta T_i$	$T_i$	Protection Rate Jan. 1979
		Domestic Prices	Internatio- nal Prices							
	(1) <sup>a</sup>	(2) <sup>a</sup>	(3)	(4)	(5) <sup>a</sup>	(6) <sup>b</sup>	(7) <sup>c</sup>	(8) <sup>d</sup>	(9) <sup>e</sup>	(10)
Yarn .....	.79	1.72	.03	.99	-.09	.76	.47	-.53	-.14	.68
Cloth .....	.36	1.26	.03	.99	-.11	.33	.72	-.38	.17	.70
Socks .....	1.04	1.91	.03	.99	-.16	1.01	.36	-.64	-.21	.89
Shirts .....	1.04	1.91	.03	.99	-.16	1.01	.36	-.64	-.21	.89
Liquid and compressed gas	1.05	1.95	.13	.99	-.22	.92	.40	-.60	-.30	.39
Synthetic fibres .....	.56	1.50	.04	.99	-.09	.52	.59	-.41	.09	.68
Paints & varnishes .....	.95	1.68	.07	.99	-.33	.88	.41	-.49	-.01	.39
Glass and glassware .....	1.05	2.00	.13	.99	-.17	.92	.40	-.60	-.24	.59
Cement .....	1.01	1.76	.17	.98	-.24	.84	.43	-.57	-.27	.34
Electric machinery .....	.45	1.45	.12	.99	-.09	.33	.72	-.38	.20	.75
Communication equipment	.44	1.45	.12	.99	-.09	.32	.73	-.37	.38	.72
Electric bulbs and tubes ..	.94	1.59	.13	.99	-.46	.81	.44	-.56	.06	.34
Tractors .....	.41	1.50	.12	.99	-.14	.29	.75	-.25	.48	.72
Scientific equipment .....	.67	1.45	.11	.99	-.31	.56	.57	-.43	.05	.34

<sup>a</sup> Natural logarithms of absolute values. - <sup>b</sup> Difference in redundancy rates not accounted for by changes in international prices. - <sup>c</sup> Inverse function (exponential) applied to values of Column (6) multiplied by -1 to show a decrease. - <sup>d</sup> Hypothetical change in the rate of protection to achieve estimated change in rates of convergence. - <sup>e</sup> Hypothetical level of protection rate in January 1979, necessary to achieve estimated reduction in rates of convergence.

Source: Table in Appendix.

evaluate the role of devaluation, changes in domestic prices vis-à-vis the direct impact of the devaluation have to be taken into account. Columns (2) and (4) in Table 3 show that the increase in domestic prices had a much greater importance in reducing redundancy than devaluation had in maintaining it<sup>1</sup>. On average, for the 14 products sampled here, tariff cuts explained 25 percent of the differences in convergence rates, whereas the real appreciation of the peso was responsible for 75 percent of that change.

Another interesting issue to pursue is to test the potential of external tariff changes by holding the real exchange rate constant and by computing the cuts in the rates of protection necessary to produce the rate of convergence which was actually achieved (Columns (6) through (10) in Table 3).

Column (6) shows the decrease in rates of convergence not explained by changes in international prices, and Column (7) shows the result of applying the inverse function to the values in Column (6). In the case of yarn, Column (5) shows that the rate of protection for yarn declined by 9 percent during the period. In order to have the rate of convergence declining from 1.61 to .73 in the period, under the assumption that the real exchange rate remained constant, and given actual changes in international prices, the rate of protection should have been reduced by 53 percent ( $1 - .47$ ; Column (7)). To achieve this rate of decline in the rate of protection, and given its initial level, equation (5) implies that protection should have been negative in January 1979, corresponding to a tax of 14 percent on the domestic good (Column (9)). This subsidy to imports contrasts with the actual positive protection level of 68 percent (Column (10), Table 3)<sup>2</sup>. Column (9) shows that, under the present assumptions, subsidies to 7 out of the 14 import product groups would have been necessary to achieve a decline in redundancy equal to the estimated ones. Furthermore, if one considers that other fees were in all cases equal to or greater than 24 percent (see table in the Appendix), negative tariffs would have been necessary in 12 out of the 14 product groups to achieve the estimated rates of protection in Column (9), which contrast with the actual ones in Column (10). To sum up, the rapidly declining real exchange rate was the policymakers' most important means of enforcing competition, leading to potential price reductions which would not have been possible had they used other instruments. However, by switching from relatively high to "negative" protection in a short period of

<sup>1</sup> Although the rate of devaluation and the rate of domestic price increases are known to interact, the present framework considers only direct effects.

<sup>2</sup> The rate for yarn was obtained as follows: Using (5), and setting  $\ln(1 + \dot{p}^d) = \ln(1 + \dot{r})$   
 we have:  $\ln RC_1 - \ln RC_0 = \ln(1 + \dot{p}^c) + \ln(1 + \dot{T}')$   
 where:  $T' = (T'_1 - T_0)/(1 + T_0)$

Substituting the values for yarn from Columns (1), (3), and (6) yields:  $.79 = .03 + .76$

The values in Column (10) were then obtained as follows:

$$\dot{T}' = e^{-.76} - 1 = -.53 = (T'_1 - .84)/1.84 \text{ and } T'_1 = -.14$$

time, it laid also the basis for a serious misallocation of resources in the industrial sector.

#### IV. Qualifications and Impact on Inflation

The preceding analysis is based on the functioning of the Law of One Price. A few aspects of this law, referring to product homogeneity, local margins and transport costs, will be highlighted in this section. In addition, some other aspects, such as lags involved in the impact of negative redundancy on domestic prices and developments in market structure, are also briefly discussed.

After the contributions of Chamberlin and Robinson in the 1930s, economists have become more aware of artificial or real product differentiations as key elements in market stratification. Two products, which are identical in everything but the brand name under which they are sold, can appeal to different groups and therefore have different equilibrium prices. Thus, prices and margins for imported and import-competing goods may well differ. The same may be said in relation to internal transport costs, since there is no *a priori* reason to assume that imported and import-competing goods use the same channels to arrive at the final consumer market. While trying to avoid some of these problems by referring to ex-factory and ex-port prices and by using the wholesale price index, there is still the assumption that the latter two prices should be equal in equilibrium. It is only in that context that the concept of redundancy is relevant. Consider, however, the case where the two products – the imported one and the locally produced one – are not homogeneous but are close substitutes. If there is a constant spread between the two prices, then our methodology can easily be adjusted to accommodate that case. The level of redundancy, in particular, would have to be reinterpreted in that light.

As seen in Section III, negative redundancy was present in many industries in January 1979, and had increased further in August 1979. On the other hand, the impact of this phenomenon on overall inflation in Argentina became apparent only in the last quarter of 1979<sup>1</sup>. This lag is explained by product differentiation and the adjustments required of consumers to react to new imported products on the demand side, and by the rigidities of previously protected import channels as well as high and volatile price changes on the supply side<sup>2</sup>. Traditionally, Argentina has had weak and insignificant distribution channels among importers, wholesale dealers, and retailers. There is evidence that beyond the expected substitution in consumption and production, which negative redundancy implies, there was also

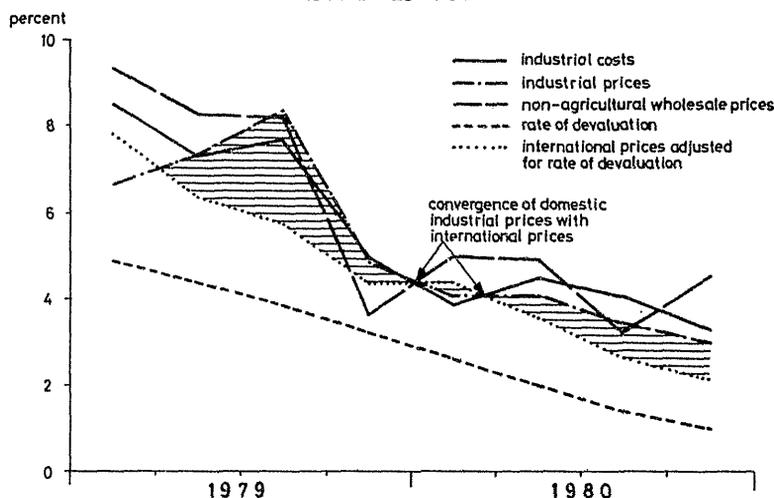
<sup>1</sup> Wholesale price changes declined, on an annual basis, from 177 percent in the first three quarters of 1979 to 31 percent in the fourth quarter of the same year.

<sup>2</sup> For a discussion of the role of an unexpected and uneven rate of inflation, see Blejer and Hillmann [1982].

substitution in commercialization. This latter adjustment means that import-competing industries bought and sold imported products which they had previously competed with. Producers of hardware, for instance, began to import some foreign hardware products, and in domestic production specialized in fewer products. Concentration of industrial ownership is estimated to have increased in Argentina during the period, contributing to the lag of nine months which negative redundancy needed to have some impact on inflation<sup>1</sup>. Indeed, several domestic producers had control over the path of adjustment to foreign competition<sup>2</sup>.

While the adjustment process differed significantly from industry to industry, and even from firm to firm within a given branch of industry, a trend of gradual price stabilization was discernible by the last four months of 1979. The deceleration of monthly price increases from an average of 7.7 percent during the first eight months of 1979 to an average of 3.8 percent after September 1979 was made possible by precipitous cuts in the rate of increase of production costs, which had started in July of the same year. Both of these trends are shown in the figure below and are contrasted with external price increases, the rate of devaluation, and the overall non-agricultural wholesale price index.

*Average Monthly Cost and Price Increases of Industrial Firms Compared with Increases in Wholesale Prices, Devaluation and International Inflation, 1979 I - 1980 IV*



<sup>1</sup> Note that the major stabilization policies were announced in late 1978, and implemented in early 1979.

<sup>2</sup> For some further evidence on the compatibility of negative redundancy and monopolistic behavior, see Nogues [1983 b].

Table 4 - Absolute and Relative<sup>a</sup> Price Increases in Industry, 1977-1980 (percent)

	1977/78		1978/79		1979/80 <sup>b</sup>	
	abs.	rel.	abs.	rel.	abs.	rel.
I Prices of industries with						
(1) continuously high effective protection						
Sugar & products .....	117.7	84.9	113.8	92.7	87.5	116.7
Tobacco products .....	159.5	101.2	131.8	100.5	84.3	114.7
Printing & publishing ....	197.5	116.0	141.9	104.9	106.7	128.6
Pharmaceuticals .....	159.6	101.2	119.3	95.1	92.8	120.0
Petrochemicals .....	155.6	99.6	102.3	87.7	97.4	122.8
Cement .....	207.0	119.7	188.4	125.3	92.8	120.0
Industrial construction ....	137.0	92.4	161.2	113.7	99.2	124.0
Iron & steel <sup>c</sup> .....	150.3	101.1	103.7	88.8	76.9	110.1
Automobiles & parts .....	130.9	90.0	133.6	101.3	81.8	113.2
Rubber products .....	154.2	99.1	126.8	98.4	83.6	114.3
Group (1) average .....	156.9	100.2	132.3	100.1	90.3	118.4
(2) increased import competition						
Food & beverages .....	166.5	103.9	132.9	101.0	53.2	95.3
Meat packing .....	177.6	108.2	160.6	113.0	51.0	94.0
Textiles & clothing .....	162.9	102.5	156.9	111.4	49.7	93.2
Paper & products .....	160.9	101.7	170.9	117.5	49.8	93.2
Leather & leather products.	145.2	93.1	208.1	159.3	39.7	86.9
Cosmetics & cleaning material .....	204.1	118.6	130.6	100.0	73.1	107.8
Metal products .....	118.6	85.3	145.7	106.6	41.4	88.0
Electr. mach. & apparatus .	143.8	95.0	122.4	96.5	64.5	102.4
Tractors .....	130.2	89.8	130.6	97.4	61.6	100.6
Group (2) average .....	156.6	100.0	151.0	108.8	53.8	95.7
II Comparative price indicators						
Non-agric. wholesale prices .	156.5	100.0	130.6	100.0	60.7	100.0
Imported product prices ....	75.9	68.5	93.0	83.7	61.7	101.7
Construction prices .....	137.0	92.4	161.2	113.7	105.0	128.0
Consumer prices .....	175.5	107.4	158.4	112.1	84.0	114.5

<sup>a</sup> The relative price is defined by the ratio between changes in industrial prices ( $1 + \dot{p}_{10}$ ) and overall non-agricultural wholesale prices ( $1 + \dot{p}_{NA}$ ). - <sup>b</sup> September 1979 to September 1980. - <sup>c</sup> Basic metals remained protected by quantitative restrictions but since government price policy for major products followed the changes indicated by preannounced exchange rate devaluation, that branch could also be classified into the second group. In that case, the variance of the inflation rates between the two group averages would have been even wider.

Source: INDEC [var. iss.].

The tendency of a significantly lower rate of inflation continued during the first four months of 1980. However, by mid-1980 the gap between international inflation, adjusted for devaluation, and domestic price increases widened again, reflecting the apparent inability of industrial firms to reduce costs further. Not all firms and industries were under competitive pressure, since uneven protection continued to provide shelter for a number of industries. Real wages had grown strongly in 1979; although they were brought down somewhat in early 1980 by those firms facing increased competition, they continued to increase during 1980 for most firms producing goods and services not affected by international competition<sup>1</sup>. In addition, the macroeconomic framework was seriously weakened by the financial crisis in April 1980, which reinforced the doubts of the industrial entrepreneurs' and managers concerning the sustainability of the new strategy.

With so many events interfering with the price-converging mechanism, it can be argued that the Purchasing Power Parity theory had no chance of succeeding in Argentina. The high degree of variance in price changes among major industrial branches reflects the remnants of different degrees of protection in the Argentine manufacturing sector (see Table 4). If protection had been both equalized and lowered as in the case of Chile, it would have been possible to reach a better degree of convergence and, thereby, price stabilization. However, the question remains whether it would have been a viable solution beyond the short run. It is to the impact of the program upon output and employment growth that we turn to next.

#### **V. The Impact of the Program on Output and Employment Growth**

In order to improve industry's competitiveness and to reduce distortions in resource allocation and relative prices, goods and capital markets had been progressively opened up to foreign competition after 1976. Tariff reductions in 1976, the application of a five-year tariff liberalization schedule reinforced by specific tariff cuts in 1979, and, most importantly, the real appreciation of the peso brought a good part of domestic industry face to face with external competition. The manufacturing firms were expected to respond to the challenge by adjusting the composition and quality of output through eliminating the use of redundant factors, and by shifting to more efficient techniques of production.

Subsector statistics for the period between 1978 and 1980 seem to partially bear out the intended results. While imports were increasingly penetrating the domestic market, rising from 19 percent of total industrial supply in 1975/76 to 25 percent in 1979/80, productivity gains became widespread in most manufacturing subsectors. After the 1978 recession, total manufacturing

<sup>1</sup> The impact of high differential borrowing costs may have been more damaging for many firms. The figure above, however, captures only production costs.

Table 5 - Output, Employment, and Productivity Changes 1977-1980 (1970 = 100)

Industries	1977			1978			1979			1980		
	Output	Employment <sup>a</sup>	Productivity									
(1) With continuing high effective protection												
Cigarettes & tobacco .	121.8	112.3	108.5	123.2	111.6	110.4	131.2	106.3	123.4	126.9	100.7	126.0
Printing & publishing	97.4	81.9	118.9	100.4	80.9	124.1	93.2	80.1	116.5	98.5	88.9	110.8
Pharmaceuticals & other chemicals . . .	126.4	103.4	121.7	112.2	89.6	125.2	120.6	85.6	140.9	127.0	83.0	153.0
Rubber products . . . .	149.1	136.7	109.1	130.7	121.0	103.7	102.2	144.4	112.3	151.2	132.6	114.0
Cement & other non-metallic minerals . .	117.3	97.8	119.1	116.8	92.8	124.8	121.9	95.6	127.5	118.4	91.7	129.1
Iron & steel . . . . .	119.9	130.9	91.6	101.3	118.1	85.8	185.0	120.2	153.9	180.2	113.2	159.2
Non-ferrous metals . .	109.3	147.3	74.2	95.9	138.2	69.4	129.8	145.0	89.5	139.0	138.2	100.6
Transport materials . .	118.3	125.9	94.0	93.3	101.0	92.4	128.6	110.3	116.6	144.0	106.6	135.1
Group (1) average .	119.9	117.0	102.5	110.4	106.7	103.5	126.6	110.9	114.2	135.1	106.9	127.0
(2) With increased import competition												
Food & beverages . . .	111.7	120.4	97.2	107.8	115.1	93.7	116.7	115.9	100.7	117.9	115.8	101.8
Textiles & clothing . .	115.3	100.1	115.2	96.5	99.0	97.4	109.4	96.1	113.9	92.8	65.1	142.6
Leather goods & shoes	91.1	121.8	74.8	89.6	107.1	83.7	82.0	101.4	80.8	70.9	81.9	86.5
Paper & carton . . . . .	115.1	119.9	96.0	118.7	121.0	98.1	133.0	121.7	109.3	108.9	101.3	107.5
Chemicals . . . . .	140.0	118.5	118.1	120.2	107.4	119.9	152.7	107.3	142.3	131.8	99.9	131.9
Glass & porcelain . . .	93.0	103.9	89.5	93.5	104.3	89.6	106.5	109.4	97.3	100.8	101.3	99.5
Metal products . . . . .	135.0	113.2	119.3	115.0	102.7	112.0	131.4	109.8	119.7	123.4	96.8	127.5
Machinery . . . . .	163.3	99.8	163.6	122.6	85.5	143.4	130.6	87.3	149.6	118.5	73.7	160.8
Group (2) average .	120.5	112.2	109.2	107.9	102.8	104.7	120.2	105.9	114.2	108.1	91.2	118.7

<sup>a</sup> Working hours per year.

Source: Ministry of Economy, Treasury and Finance [1981].

output rose substantially in 1979, but continued to advance in 1980 only in those sectors which still enjoyed a substantial degree of protection (Table 5). All firms laid off workers on a rather massive scale, with overall industrial employment being 25 percent less in 1980 than in 1975. As expected, employment cuts were especially severe in those firms that were more exposed to external competition, leading to sizeable productivity increases in some subsectors. But among that group there did not emerge a pattern of selection according to comparative advantage. In those branches in which one would have expected continuous output and productivity gains, such as food and leather products characterized by their favorable natural resource endowment and machinery with its skill intensity, output hardly advanced or fell and labour productivity advanced less than the group average. This occurred at the same time as imports were increasingly penetrating the domestic market, rising from 19 percent of the total industrial supply in 1975/76 to 25 percent in 1979/80.

The situation deteriorated rapidly in 1981. That year saw the liberalization attempt being gradually abandoned and several massive peso devaluations; industrial output fell precipitously by over 10 percent and so did industrial employment. However, while laid-off workers had been able to find jobs in the non-tradeable sector until 1980, output and income fell in that sector, in 1981, since it suffered similarly from financial strains as did the rest of the economy<sup>1</sup>. As a consequence, open unemployment more than doubled, increasing from 2.6 percent in October 1980 to 5.8 percent in April 1982.

Manufacturing output fell by another 4.5 percent in 1982 and was not able to recover in 1983. What started as a promising approach to stabilize prices and improve resource allocation in industry ended in the deepest and longest recession Argentina has experienced since World War II. While a large part of the problem emanated from the financial sector, it nevertheless became clear that the trade liberalization route of price stabilization was at least as costly as the traditional demand-oriented price stabilization programs, if not costlier.

## VI. Summary and Conclusions

The main purpose of this paper was to present a simple framework for analyzing the impact of various import liberalization measures on the potential competitiveness of the industrial sector. The major instruments used and their relative efficacy were compared and evaluated. In the case of Argentina, it was demonstrated to what extent tariff redundancy was eliminated through the exchange rate policy of the authorities. Reductions in external tariffs

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<sup>1</sup> For a more detailed analysis of the financial liberalization effort and its impact in Argentina, see Fernandez and Rodriguez [1982], and Wogart [1983].

were of secondary importance. Although the sample of industries we used did not include the food, beverage and tobacco nor the wood and furniture industries (ISIC 31 and 33), it was shown that tariff redundancy had been eliminated in two thirds of the major manufacturing branches by early 1979, at a time when the authorities began to apply the "active" crawling peg and discriminating tariff reductions. While we have not attempted to evaluate the effectiveness of these temporary tariff cuts, it is noteworthy that 9 of the selected 11 industrial branches would have experienced negative redundancy and thereby would have been subject to intense foreign competition even without these specific tariff measures.

Although the redundancy analysis is not a forecasting tool, it indicates the possible amount of price deceleration which can be expected under long-run price convergence. It would seem indeed that convergence calculations based on the PPP thesis can be used correctly only when *individual* product prices in international and domestic markets are compared. As Table 1 has shown, the analysis also points at the future impact of an "overshoot" on industrial activity and imports. The methodology presented here can be refined in many ways, but the major policy implications should become clear from the foregoing analysis. Programs of import liberalization should include some device to monitor the price evolution of domestic traded goods and imports, thus enabling policymakers to identify at an early point in time the effects that various measures may have on the competitiveness of individual industrial subsectors as well as industry as a whole. This approach may avoid uneven treatment and the possible sacrifice of firms and branches which, under normal conditions, could and should survive.

## Appendix

## Argentina: Approximation of Redundancy in External Tariffs of 40 Selected Products or Product Groups (percent)

	June 1977					
	Implied Tariff <sup>a</sup> (P <sub>0</sub> )	Nominal External Tariff <sup>b</sup> (g <sub>0</sub> )	Import Fees <sup>c</sup> (f <sub>0</sub> )	Rate of Protection <sup>d</sup> (T <sub>0</sub> )	Imputed Redundancy <sup>e</sup> (R <sub>0</sub> )	Rate of Convergence <sup>f</sup> (RC <sub>0</sub> )
	(1)	(2)	(3)	(4)	(5)	(6)
Textiles & clothing						
Yarn .....	14	60	24	84	70	1.61
Cloth .....	11	65	24	889	78	1.70
Socks .....	-12	95	24	119	131	2.49
Shirts .....	79	95	24	119	40	1.22
Paper & paper products						
Pulp .....	-21	5	28	33	54	1.68
Paper .....	6	20	34	54	48	1.45
Chemicals						
Liquid & compressed gas .....	-21	50	24	74	95	2.20
Tanning materials .....	-38	50	24	74	112	2.81
Basic chemical substances .....	-2	50	24	74	76	1.78
Fertilizers .....	-14	50	24	74	88	2.02
Pesticides .....	32	65	24	89	57	1.43
Synthetic resins .....	10	70	24	94	84	1.76
Synthetic fibers .....	49	60	24	84	35	1.23
Paints and varnishes .....	-21	70	24	94	115	2.46
Rubber products						
Tires .....	2	80	24	104	102	2.00
Non-metallic minerals						
Glass & glassware .....	-12	65	24	89	101	2.15
Cement .....	-21	45	24	69	90	2.14
Basic metals						
Iron and steel .....	27	50	34	84	57	1.45
Non-ferrous metals .....	16	45	28	73	57	1.49
Metal products						
Metal containers .....	-1	65	28	93	94	1.95
Cans .....	-21	65	28	93	114	2.44
Ovens and stoves .....	-11	100	28	128	139	2.56
Non-electric machinery						
Motor and turbines .....	5	65	28	93	88	1.84
Agricultural machinery .....	-15	65	28	93	108	2.27
Metal & wood working machinery .....	-2	65	28	93	95	2.19
Machine tools .....	8	65	28	93	85	1.78
Office machines .....	74	65	28	93	19	1.10
Elevators .....	30	65	28	93	63	1.48
Refrigerators & air conditioning .....	-20	100	28	128	148	2.85
Electrical machinery & accessories						
Electrical machinery .....	6	65	28	93	87	1.82
Radio and T.V. .....	35	100	24	124	89	1.67
Communication equipment .....	34	65	24	89	55	1.41
Batteries .....	21	95	24	119	98	1.81
Electrical bulbs & tubes .....	29	90	24	114	85	1.67
Electrical conductors .....	16	70	24	94	78	1.67
Transport equipment						
Railways equipment .....	2	78	34	112	110	2.07
Auto engines .....	6	95	32	127	121	2.14
Tractors .....	-9	65	32	97	116	2.16
Motorcycles & bicycles .....	65	93	32	125	60	1.36
Scientific equipment .....	36	60	24	84	48	1.35

(continued)

(continued)

	January 1979					
	Implied Tariff <sup>a</sup> (P <sub>1</sub> )	Nominal External Tariff <sup>b</sup> (G <sub>1</sub> )	Import Fees <sup>c</sup> (I <sub>1</sub> )	Rate of Protec- tion <sup>d</sup> (T <sub>1</sub> )	Imputed Redun- dancy <sup>e</sup> (R <sub>1</sub> )	Rate of Conver- gence <sup>f</sup> (RC <sub>1</sub> )
	(7)	(8)	(9)	(10)	(11)	(12)
Textiles & clothing						
Yarn .....	130	44	24	68	-62	.73
Cloth .....	42	46	24	70	28	1.19
Socks .....	115	65	24	89	-26	.88
Shirts .....	338	65	24	89	-249	.43
Paper & paper products						
Pulp .....	52	10	28	38	-14	.91
Paper .....	76	20	34	54	-22	.87
Chemicals						
Liquid & compressed gas .....	80	15	24	39	-41	.77
Tanning materials .....	-25	15	24	39	64	1.85
Basic chemical substances .....	57	28	24	52	-5	.97
Fertilizers .....	43	13	24	37	-6	.95
Pesticides .....	85	39	24	63	-22	.88
Synthetic resins .....	80	39	24	63	-17	.90
Synthetic fibers .....	139	44	24	68	-71	.70
Paints and varnishes .....	46	15	24	39	-7	.95
Rubber products						
Tires .....	45	47	24	71	26	1.17
Non-metallic minerals						
Glass & glassware .....	113	35	24	59	-54	.75
Cement .....	70	10	24	34	-36	.78
Basic metals						
Iron and steel .....	50	36	34	70	20	1.13
Non-ferrous metals .....	59	35	28	63	4	1.02
Metal products						
Metal containers .....	5	40	28	68	63	1.60
Cans .....	8	10	28	38	30	1.27
Ovens and stoves .....	44	50	28	78	34	1.23
Non-electric machinery						
Motor and turbines .....	27	50	28	78	51	1.40
Agricultural machinery .....	48	46	28	74	26	1.17
Metal & wood working machinery .....	35	48	28	76	41	1.30
Machine tools .....	37	48	28	76	39	1.28
Office machines .....	137	50	28	78	-79	.69
Elevators .....	85	48	28	76	-9	.95
Refrigerators & air conditioning .....	89	55	28	83	-6	.97
Electrical machinery & accessories						
Electrical machinery .....	50	47	28	75	25	1.16
Radio and TV .....	85	75	24	93	14	1.05
Communication equipment .....	89	48	24	72	-17	.91
Batteries .....	93	40	24	64	-29	.84
Electrical bulbs & tubes .....	105	10	24	34	-71	.65
Electrical conductors .....	64	46	24	70	6	1.03
Transport equipment						
Railways equipment .....	25	50	34	84	59	1.47
Auto engines .....	23	85	32	117	94	1.77
Tractors .....	20	40	32	72	52	1.43
Motorcycles & bicycles .....	145	75	32	107	-38	.84
Scientific equipment .....	94	10	24	34	-60	.69

(continued)

(continued)

	August 1979					
	Implied Tariff <sup>a</sup> (P <sub>2</sub> )	Nominal External Tariff <sup>b</sup> (E <sub>2</sub> )	Import Fees <sup>c</sup> (I <sub>2</sub> )	Rate of Protec- tion <sup>d</sup> ,g (T <sub>2</sub> )	Imputed Redun- dancy <sup>e,h</sup> (R <sub>2</sub> )	Rate of Conver- gence <sup>f</sup> (RC <sub>2</sub> )
	(13)	(14)	(15)	(16)	(17)	(18)
<b>Textiles &amp; clothing</b>						
Yarn .....	167	42 (15)	24	62 (39)	-101 (-130)	.61 (.52)
Cloth .....	134	44	24	68	-66	.71
Socks .....	142	45	24	69	-73	.70
Shirts .....	393	63	24	87	-306	.38
<b>Paper &amp; paper products</b>						
Pulp .....	92	10	28	38	-54	.71
Paper .....	125	20	34	54	-71	.68
<b>Chemicals</b>						
Liquid & compressed gas	71	15	24	39	-32	.81
Tanning materials .....	-35	10	24	34	67	2.00
Basic chemical substances	58	25	24	49	-9	.94
Fertilizers .....	61	13	24	37	-24	.85
Pesticides .....	95	34	24	58	-37	.81
Synthetic resins .....	78	37	24	61	-17	.90
Synthetic fibers .....	171	30	24	54	-117	.56
Paints and varnishes .....	75	15	24	39	-36	.79
<b>Rubber products</b>						
Tires .....	68	45	24	69	1	1.00
<b>Non-metallic minerals</b>						
Glass & glassware .....	150	23	24	47	-103	.58
Cement .....	141	0	24	24	-117	.51
<b>Basic metals</b>						
Iron and steel .....	58	34	34	68	10	1.06
Non-ferrous metals .....	126	36	28	62	-64	.71
<b>Metal products</b>						
Metal containers .....	67	40	28	68	1	1.00
Cans .....	32	16	28	44	12	1.09
Ovens and stoves .....	70	36	28	64	-6	.96
<b>Non-electric machinery</b>						
Motor and turbines .....	48	48 (0)	28	76 (28)	28 (-20)	1.18 (.86)
Agricultural machinery .....	55	26 (0)	28	54 (28)	-1 (-27)	.99 (.83)
Metal & wood working machinery .....	64	23 (0)	28	51 (28)	-13 (-36)	.92 (.78)
Machine tools .....	61	22 (0)	28	50 (28)	-11 (-33)	.93 (.79)
Office machines .....	220	38 (0)	28	66 (28)	-154 (-192)	.51 (.40)
Elevators .....	125	23 (0)	28	51 (28)	-74 (-97)	.67 (.57)
Refrigerators & air conditioning .....	31	48	28	76	45	1.34
<b>Electrical machinery &amp; accessories</b>						
Electrical machinery .....	80	29 (0)	28	57 (28)	-23 (-52)	.87 (.71)
Radio and T.V. ....	132	73	24	97	-34	.84
Communication equipment	128	23 (0)	24	47 (24)	-81 (-104)	.64 (.54)
Batteries .....	200	22 (0)	24	46 (24)	-154 (-176)	.48 (.41)
Electrical bulbs & tubes	131	10 (0)	24	34 (24)	-97 (-107)	.58 (.53)
Electrical conductors .....	97	43	24	67	-30	.84
<b>Transport equipment</b>						
Railways equipment .....	31	48	34	82	51	1.39
Auto engines .....	49	93	32	127	78	1.52
Tractors .....	49	40	32	72	23	1.15
Motorcycles & bicycles .....	209	62	32	94	-115	.62
Scientific equipment .....	141	10	24	34	-107	.55

<sup>a</sup> Difference between domestic (p<sup>d</sup>) and international prices (p<sup>c</sup> · r) measured in local currency and based on data supplied by the Ministry of Economy, Secretariat of Commerce. - <sup>b</sup> Data from *Guía Práctica del Exportador e Importador* (Buenos Aires, var. iss.). - <sup>c</sup> Average non-tariff fee on imports including various fees for special funds. Data from Ministry of Economy, Secretariat of Commerce. - <sup>d</sup> Sum of tariff plus fees. - <sup>e</sup> Difference between rate of protection and implied tariff. - <sup>f</sup> Rate of protection over implied tariff. - <sup>g</sup> Approximated by inflating June 1977 implied tariff by change in domestic prices (WPI) and deflating by change in international prices (US producer prices) and by exchange rate devaluation.

*Note:* For August 1979 a number of products were subject to temporary tariff cuts. The corresponding values are shown in parentheses.

*Source:* Data obtained from Central Bank of Argentina. - For other data see footnotes above. - Our estimates.

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Zusammenfassung: Handelsliberalisierung, Zollredundanz und Inflation: Eine auf Argentinien angewandte methodologische Untersuchung. - Der Hauptzweck dieser Arbeit besteht darin, einen einfachen Rahmen für die Analyse der Auswirkungen verschiedener Maßnahmen der Importliberalisierung auf die Wettbewerbsfähigkeit des gewerblichen Sektors

zu entwickeln. Im Fall von Argentinien wird gezeigt, daß das Hauptinstrument zur Beseitigung der Zollredundanz die Wechselkurspolitik der Regierung war. Zollsenkungen waren von zweitrangiger Bedeutung. Die Zollredundanz scheint bis Anfang 1979 beseitigt gewesen zu sein, zu einer Zeit, in der die Behörden begannen, diskriminierende Zollsenkungen vorzunehmen. Aus der Redundanzanalyse ergeben sich Hinweise auf das Ausmaß der möglichen Abschwächung der Preissteigerungsrate, die bei langfristiger Konvergenz der in- und ausländischen Preise erwartet werden kann. Konvergenzberechnungen, die auf der Kaufkraftparitätentheorie basieren, können anscheinend nur dann korrekt verwendet werden, wenn die Preise einzelner Produkte auf den in- und ausländischen Märkten verglichen werden. Die dargestellten Methoden können zwar verbessert werden, aber die wichtigsten Folgerungen für die Politik dürften sich bereits aus der durchgeführten Analyse klar ergeben.

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Résumé: La libéralisation du commerce, l'excédent tarifaire, et l'inflation: une exploration méthodologique appliquée à l'Argentine. - Le but principal de cet article est présenter un cadre simple pour analyser l'impacte des plusieurs mesures de libéralisation d'importation sur la capacité de concurrence potentielle du secteur industriel. Pour l'Argentine, les auteurs démontrent que l'instrument clef pour éliminer l'excédent tarifaire était la politique de taux de change des autorités. Les réductions des tarifs externes étaient moins importantes. Il semble clair que les autorités avaient éliminé l'excédent tarifaire au début de 1979, au moment où ils commençaient à réduire les tarifs d'une manière discriminatoire. L'analyse de l'excédent indique la mesure possible de la décélération de prix qui peut être attendue sous la condition d'une convergence de prix à long terme. Actuellement il paraît que les calculs de convergence qui basent sur la thèse de PPA peuvent être appliqués correctement seulement si les prix des biens individuels sur les marchés internationaux et locaux sont comparés. En effet la méthodologie présentée ici peut être perfectionnée, mais cette analyse devrait déjà avoir montré les principales implications politiques.

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Resumen: Liberalización del comercio, redundancia tarifaria e inflación: una exploración metodológica aplicada a la Argentina. - El propósito principal de este artículo es presentar un marco simple para analizar el impacto de varias medidas de liberalización de importaciones sobre la competitividad potencial del sector industrial. En el caso de Argentina se demuestra que el instrumento clave al eliminar la redundancia tarifaria fue la política cambiaria de las autoridades. Las reducciones en las tarifas externas fueron de importancia secundaria. Parece claro que la redundancia tarifaria había sido eliminada ya a principios de 1979, en una época en que las autoridades comenzaron a aplicar reducciones tarifarias discriminatorias. El análisis de redundancia indica el posible monte de desaceleración de precios que puede esperarse bajo una convergencia de precios de largo plazo. En verdad pareciera que los cálculos de convergencia basados en la tesis PPP pueden ser utilizados correctamente solo cuando se comparan precios de productos individuales en los mercados internacional y doméstico. La metodología presentada aquí puede ser refinada de varias maneras, pero las principales implicaciones de política deberían quedar claras de acuerdo al análisis precedente.

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