First Draft

How Far Have Commercial Policy Reforms in Argentina Gone?

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Summary: *The purpose of this paper is to assess the extent to which changes in commercial policies in Argentina during the 90s have contributed to expand the country's volume of trade compared to that of the 80s. Our estimates indicate that the commercial policies of the 90s resulted in a decline in the relative price of imported goods vis-à-vis exportable agricultural goods of about 25 percent compared to its 1985-1989 average. In response to this decline, it is estimated that imports increased by 30 percent. This increase represents about 25 percent of the total increase in the volume of imports. On the other hand, increases in aggregate demand and in real output are estimated to account for 50 percent of the increase in imports. JEL Code: F1.*

1. Trade liberalization policies were introduced in Argentina during the 90s along with macroeconomic reforms, privatization of public sector enterprises, and de-regulation of the economy. Real output and aggregate expenditure increased by about 30 and 40 percent, respectively, compared to their averages during 1985-89. Compared to the average of this period, the quantity of imports and exports in Argentina during the 90s increased by 350 and 90%, respectively. However, exports and imports of goods still represent about 9 percent of GDP and this figure is similar to the ones of the 70s and 80s. The question is then to which extent trade has been liberalized in Argentina during the 90s.

2. This paper is aimed at estimating the magnitude of the tax on trade that is equivalent to the distortions resulting from the commercial policies implemented during the 90s and its impact on the volume of trade. In Section I there is a description of the commercial policies in Argentina followed in the last three decades and the equivalent taxes on trade are calculated for different time periods. In Section II, an import function is estimated in order to evaluate the impact of changes in this tax during the 90s on the volume of trade. In Section III, the increase in the quantity of imports during the 90s compared to that of the period 1985-89 is decomposed into its sources, namely, changes in commercial policies, in external terms of trade, and in real output and expenditure. In addition, the section presents estimates of the welfare cost of protection. Finally, the concluding remarks are in Section IV.

I. Commercial Policies and Relative Prices

3. As is well documented by Diaz-Alejandro (1970) and by J. Berlinski (2001), protection to import-competing activities arose in Argentina as a response to the crisis of the 30s. Trade restrictions intensified during the 40s and part of the 50s as the government pursued a policy of inward-looking industrialization. High tariffs, import licensing and prohibitions were extensively used along with subsidization of inputs. In the

mid-60s, attempts were made to reduce the anti-export bias of commercial policies by establishing a drawback regime for exports of manufactured goods.

4. In 1967, the government reduced significantly maximum import tariffs from about 120 to 60 percent in order to offset, at least in part, the effects of a 40 percent currency devaluation on the domestic price level. At the same time, taxes on traditional exports were imposed in order to rise fiscal revenue as part of a price stabilization plan. These export taxes were gradually eliminated during the year to compensate producers of exportable goods for the rising inflation. In addition, most of import prohibitions were removed.

5. In 1971, multiple exchange rates discriminating against exports were re-introduced. In 1973, quantitative restrictions were re-introduced along with foreign exchange controls and import deposit requirements. During the Martínez de Hoz administration (1976-1981), these restrictions were gradually lifted along with reductions in import tariffs, exchange rates were unified, and export taxes eliminated. In 1978-1980, import tariffs were further reduced. In 1981-1982, quantitative restrictions were re-introduced in response to a balance of payments crisis, multiple exchange rates were resumed, and the program of trade liberalization abandoned.

6. The Alfonsín administration (1983-89) tried to tighten its control over import demand by increasing quantitative restrictions. Imports that were prohibited included most goods that were locally produced. Imports subject to prior approval required the consultation with domestic producers. A 15 percent import surcharge was introduced in 1985.

7. By 1987, it was becoming apparent that import-substitution policies had failed to foster economic growth in Argentina. Between 1987 and 1988, import licensing restrictions were relaxed along with reductions in import tariffs. These trade liberalization policies were intensified during the Menem administration (1989-1999). In early 1991, import licensing was eliminated, the coverage of remaining quantitative restrictions significantly reduced, and import tariff rates reduced. In 1995, import tariffs were further reduced as the common external tariff of a regional preferential trade agreement (MERCOSUR) was adopted.

8. In an attempt to summarize the impact of the whole set of instruments of commercial policies on resources allocation, Díaz-Alejandro (1970) estimated the so-called “equivalent uniform import tariff” as the ratio of domestic prices of non-rural to exportable agricultural goods (adjusted by changes in external terms of trade). His estimates are in line with the view that the commercial policies between mid-40s and mid-50s introduced severe distortions in the economy compared to the policies of the late 20s. L. Sjaastad (1981) estimated the equivalent import tariff as the ratio of domestic price of imported to exportable agricultural goods (corrected by changes in external terms of trade). He finds that, in the 70s, the equivalent uniform import tariff was about 100 percent compared to that of less restrictive commercial policies of 1935-1939. J. Berlinski (2001)

extended Díaz-Alejandro's estimates to cover most recent commercial policy developments.

9. According to Berlinski' s estimates, the commercial policies of the late 70s were the most restrictive of the trade policies followed during the period from1960 to1999. He explains the change in relative prices during this period by the overvaluation of the real exchange rate caused, in turn, by the pegging of the exchange rate to the US dollar during this period. On the other hand, the author finds that the commercial policies of the 90s were among the less restrictive of the period covered by his study.

10. In table 1, L. Sjaastad's method of measuring the uniform equivalent import tariff is used to estimate the degree of trade restrictiveness of the commercial policies described above. The wholesale price index of imported is used as a proxy for the domestic price of import-competing goods in the calculations rather than wholesale prices of domestic manufacturing goods as the latter could be isolated from their world prices by quantitative restrictions or "water" in tariff rates[1]. As a result, changes in their domestic prices could reflect not only the changes in commercial policies and external terms of trade but also changes in aggregate expenditure and in real output. The wholesale price index of agricultural commodities is used as a proxy for the internal price of exportable commodities. This measure of relative prices of importable compared to exportable goods (adjusted by changes in external terms of trade) is thus a proxy of commercial policies as it does not include the impact of aggregate expenditure and real output on prices of non-traded goods. The uniform equivalent import tariff rates are calculated using the average relative prices during 1935-39 as a benchmark because of data availability. Although this period was not characterized by free trade, commercial policies during this period were by far less restrictive than the ones implemented later on.

Table 1: Relative Prices of Importable Goods, Terms of Trade and Equivalent Import Tariff

(1993=1.00 for price indexes)

Period	Relative Prices (1)	External Terms of Trade (2)	Ratio (1)/(2)	Uniform Equivalent Tax (%)
1935-39	0.46	0.79	0.58	--
1968-70	0.68	0.93	0.73	25.1
1971-79	0.94	0.95	0.99	70.0
1973-76	1.06	0.85	1.20	105.0
1979-80	0.76	1.06	0.72	23.6

1981-89	1.39	1.15	1.21	107.1
1981-84	1.17	1.06	1.10	88.6
1985-89	1.57	1.22	1.29	120.0
1985-87	1.50	1.22	1.23	110.6
1991-99	1.10	1.03	1.07	82.5
1995-99	1.08	1.04	1.04	77.8

11. The estimates of table 1 mirror very closely the aforementioned commercial policy developments. In particular, the reversal during 1973-1976[2] of the 1968-70 trade liberalization policies is associated with a substantial increase in taxation of trade from 24 to 105 percent (an increase of 80 percentage points in the average equivalent import tariff). The most remarkable episodes of trade liberalization took place, according to the estimates, during 1968-70 and 1979-80 when the overall taxation of trade was about 25 percent compared with that of 1935-39. The measure of trade restrictiveness presented in this paper takes well into account the reversal in subsequent years of the trade liberalization policies of the 1979-80 period. As a result of the re-introduction of quantitative restrictions, overall taxation rate on trade increased from about 24 percent during the liberalization period to about 90 percent during 1981-84. The intensification of trade restrictions from 1985 until 1987 further increased taxation of trade to 110 percent.

12. According to the data, the trade liberalization program of the 90s reduced the overall taxation of trade compared to that of 1985-87: the average equivalent import tariff fell from about 120 percent during 1985-89 to about 78 percent during 1995-99. However, the average taxation of trade during the 1995-99 trade liberalization episode compares unfavorably with that of the Martinez de Hoz administration during 1979-80 (24 percent).

13. As indicated earlier, the calculation of the equivalent uniform import tariff underestimates the anti-trade bias of commercial policies because the 1935-39 base year cannot be associated with free trade. In Díaz-Alejandro (1970) and Berlinski (2001), equivalent uniform import duties are calculated for the period 1935-39 compared to those of the 1926-29 period. According to these sources, the ratio of wholesale prices of non-agricultural to agricultural commodities (after taking into account changes in external terms of trade) increased by 13 percent during 1935-39 over that of 1926-29. If prices of non-agricultural commodities include those of goods that are not traded internationally, then this estimate of the equivalent uniform import tariff could be a lower bound of the true uniform import duty. This being the case, the equivalent uniform import tariff during 1995-99 could have reached at least 100 percent compared to that of 1926-29. It would hardly be a surprise to anyone that exports (and imports) still represent less than 10 percent of GDP as taxation of trade continues at a high rate.

II. Estimation of an Import Demand Function

14. In this section, the magnitude of impact of import taxation on the volume of imports (and of trade) is quantitatively assessed by estimating an import demand function. The theoretical framework includes three goods, namely, exportable, importable and non-traded goods. The demand for imports depends upon the prices of importable goods compared to non-traded goods (P_m/P_h), the prices of importable compared to exportable goods (P_m/P_x), the level of real income (Y), and real aggregate expenditure (Y^e):

$$(1) \quad \ln M = a_0 + a_1 \ln\left(\frac{P_m}{P_h}\right) + a_2 \ln\left(\frac{P_m}{P_x}\right) + a_3 \ln Y + a_4 \ln Y^e$$

15. The $\ln(P_m/P_h)$ variable is endogenously determined by the condition of clearance in the market for non-traded goods:

$$(2) \quad Y_h^d = D\left(\frac{P_m}{P_h}, \frac{P_m}{P_x}, Y, Y^e\right)$$

$$(3) \quad Y_h^s = S\left(\frac{P_m}{P_h}, \frac{P_m}{P_x}\right)$$

The equilibrium condition in the market for non-traded goods implies that:

$$(4) \quad \frac{P_m}{P_h} = g\left(\frac{P_m}{P_x}, Y, Y^e\right)$$

The *g* function can be specified as follows:

$$(4') \quad \ln\left(\frac{P_m}{P_h}\right) = b_0 + b_1 \ln\left(\frac{P_m}{P_x}\right) + b_2 \ln Y + b_3 \ln Y^e$$

Replacing (4') in (1), we get the reduced form of the import function

$$(5)\ \ln M = A_0 + A_1 \ln\left(\frac{P_m}{P_x}\right) + A_2 \ln Y + A_3 \ln Y^e$$

where $A_0 = a_0 + a_1 b_0$

$A_1 = a_1 b_1 + a_2$

$A_2 = a_1 b_2 + a_3$

$A_4 = a_1 b_3 + a_4$

16. The coefficients of equation (5) take thus into account not only the elasticities of the demand for imports with respect to prices of importable goods compared to exportable goods, to real output and to aggregate expenditure of equation 1, but also the impact of these variables on the relative price of importable goods compared to non-traded goods.

17. To quantify the impact of trade policies on the volume of trade, equation (5) should be estimated along with an export supply function. However, the export supply and import demand equations are not independent. The reason for this is that the balance of trade at world prices is equal to the excess of aggregate demand (Y^e) over aggregate supply (Y) when the market for non-traded goods is in equilibrium. As $Y^e - Y$ is determined by monetary and fiscal policies, and by capital inflows, the effects of, for instance, an increase in import tariffs is going to have symmetric effects on imports and exports. In other words, commercial policies that reduce the volume of imports also reduce the volume of exports and one thus needs to estimate either the import demand function or the export supply equation.

18. Equation (5) is estimated with seasonally adjusted quarterly data covering the period 1970-99. The variables are defined as follows:

(i) M is a quantity index of imports;
(ii) (P_m/P_x) variable is defined as the ratio to the wholesale price of imported to agricultural goods;
(iii) Y is the quarterly GDP at 1993 constant prices; and,
(iv) Y^e is the quarterly aggregate demand at 1993 constant prices.

19. The existence of a long-run relationship as specified in equation (5) is tested by checking the behavior of its residuals. If the hypothesis that these residuals follow an unit root process cannot be rejected, then there would not be any long-run equilibrium relationship between our variables as any departure from equilibrium would persist forever. If, on the other hand, the residuals were integrated of order cero or the variables cointegrated, then a long-run relationship among the variables can be estimated.

20. We test the order of integration of the variables using the Adjusted Fuller-Dickey (ADF) unit-root test. The results of the test of the seasonally adjusted variables are presented in Table 2. For the ADF tests, the lag-length of the first-difference of the levels of the variables is determined by minimizing the value of the Schwarz Information Criterion (SIC) over alternative lag structures. Based on the results of the ADF, the hypothesis that the variables are non-stationary cannot be rejected at 10 percent significance level.

Table 2: Augmented Dickey-Fuller Test for Unit Roots

First difference of the Variables	Lag-length of the variables in first difference	ADF Statistic	Significance level
Ln *M*	1	-.59	10%
Ln (P_m/P_x)	0	-2.63	5%
Ln *Y*	0	.04	10%
Ln Y^e	1	-.52	10%

21. The results of the estimation of the equation in the levels of the variables are presented below (the *t*- statistics are the numbers in parenthesis).

(6) $\ln M = -20.07 - .22 \ln (P_m/P_x) - 3.43 \ln Y + 6.02 \ln Y^e$
(-14.17) (-3.65) (-4.45) (9.46)

R^2=. 95 D-W=. 74 Q(1)=47.43 Q(4)=97.14 Breusch-Godfrey LM test(1)= 47.6 Breusch-Godfrey LM test(4)= 52.8

22. The least squares estimates show significant autocorrelation of residuals as indicated by the Ljung-Box Q-statistic with one and four lags of the residuals. The Breusch-Godfrey LM tests with one and four lags of the residuals also indicate that the hypothesis of autocorrelation of residuals cannot be rejected. As is well known, autocorrelation of residuals yields biased estimators of the standard errors of the coefficients and the tests of hypotheses based on these estimators are not reliable. Furthermore, the ADF test indicates that the hypothesis of unit root of the residuals can be rejected[3]; thus, the variables are cointegrated and, consequently, a long-run relationship can be estimated with the data.

23. In order to solve the problem of serial autocorrelation of residuals, an equilibrium correction representation of the autoregressive-distributed lag model is estimated. This representation is a more general specification of the serial autocorrelation of residuals than the Cochrane-Orcutt method. Let this representation take the following form:

$$(7)\ Y_t = \alpha_0 + \sum_{j=0}^{n} \alpha_{1j} X_{t-j} + \sum_{j=1}^{n} \alpha_{2j} Y_{t-j}$$

By estimating (7) by least squares, the long-run coefficient of *X* can be calculated from the short-run coefficients as follows:

$$(8)\ \beta_1 = \frac{\sum_{j=0}^{n} \alpha_{1j}}{1 - \sum_{j=1}^{n} \alpha_{2j}}$$

24. Estimating equation (7) usually involves a high degree of multicollinearity among the variables so that their coefficients cannot be estimated with precision. That is, if X_t and X_{t-1} are correlated, then ΔX_t and X_t can be nearly orthogonal. Thus, equation (7) can be reparameterized to get the following specification[4]:

$$(9)\ \Delta Y_t = \phi_0 + \sum_{j=0}^{n-1} \phi_{1j} \Delta X_{t-j} + \sum_{j=1}^{n-1} \phi_{2j} \Delta Y_{t-j} + \gamma \left(Y_{t-1} - \beta_1 X_{t-1} \right)$$

In our case, the demand for imports is specified as follows:

$$(10)\ \Delta \ln M_t = \phi_0 + \sum_{j=1}^{n-1} \phi_{1j} \Delta \ln \left(\frac{P_m}{P_x} \right)_{t-j} + \sum_{j=1}^{n-1} \phi_{2j} \Delta \ln Y_{t-j} + \sum \phi_{3j} \Delta \ln Y^e_{t-j} +$$

$$+ \gamma \left(\ln M_{t-1} - \beta_1 \ln \left(\frac{P_m}{P_x} \right)_{t-1} - \beta_2 \ln Y_{t-1} - \beta b_3 \ln Y^e_{t-1} \right)$$

25. Equation (10) is estimated by ordinary least squares instead of constrained least squares because it is a reparameterization of equation (7) and, thus, no constraints on the parameters need to be tested. The results of the estimation of equation (10) with data covering the period 1970:2-1999:4 and n=1 are presented in Table 3 below.

Table 3: Estimates of the Import Demand Function

Variables	1970:2-1999:4	1970:2-1984:4	1970:2-1984:4	1985:2-1994:4
C	-6.96 (-4.57)	-5.87 (-2.43)	-6.52 (-2.76)	-2.63 (-1.29)
$\Delta \ln(P_m/P_x)$	-.10 (-.95)	-. 11 (-. 82)	-. 11 (-. 87)	-. 22 (-1.44)
$\Delta \ln Y$	-2.03 (-2.15)	-1.67 (-1.30)	--	-. 76 (-. 53)
$\Delta \ln Y^e$	3.10 (4.21)	3.74 (3.96)	2.64 (5.59)	1.13 (. 98)

γ	-. 31 (-5.14)	-. 27 (-2.65)	-. 23 (-2.60)	-. 32 (-4.58)
$\text{Ln}(P_m/P_x)_{t-1}$	-. 34 (-2.70)	-. 28 (-1.32)	-. 45 (-2.55)	-1.26 (-3.11)
$\text{Ln}Y_{t-1}$	-2.90 (-1.77)	-2.34 (-. 95)	--	-6.53 (-2.62)
$\text{Ln}Y_{t-1}^{e}$	5.74 (4.25)	5.09 (2.64)	3.54 (5.42)	7.89 (3.83)
R^2	. 41	. 51	.51	.47
Q(4)	12.38 (.015)	3.32 (. 51)	1.77 (.78)	3.12 (. 54)
Q(8)	19.68 (.012)	5.76 (. 67)	4.79 (.78)	12.33 (.14)
Breusch-Godfrey LM Test (4 lags)	16.02 (.003)	4.47 (. 35)	1.94 (.75)	3.48 (. 48)
Breusch-Godfrey LM Test (8 lags)	23.0 (.003)	7.35 (. 50)	4.53 (.81)	11.75 (. 16)
Number of observations	119	59	59	59

Notes: The numbers in parenthesis below the estimates of the coefficients are the t-statistics. The numbers in parenthesis in the rows of the Q- and the Breusch-Godfrey statistics are the marginal probabilities of the values of the statistics.

26. The estimates of equation (10) for the whole period indicate that the hypothesis of uncorrelated residuals can be rejected according to the Q- and the Breusch-Godfrey tests. As is well known, serial autocorrelation of residuals produce inconsistent estimators of the parameters of the distributed autoregressive representation. Residual autocorrelation can be the result of either the lack of stability of parameters over time, of misspecification of the model, or of the lag length. A Wald test of the stability of parameters over time is performed by estimating equation (10) for two non-overlapping sub samples, namely, one covering the period 1970:1-1984:4 and the other covering the period 1985:2-1994:4 with the number of lags equal to one in the level of the variables[5].

27. The ADF tests indicate that the hypothesis that the variables are not stationary in both periods cannot be rejected at 10 percent significance level. The results of the tests are presented below (see table 4). Furthermore, the hypothesis that the residuals of the least squares estimates of equation (5) follow a unit root autoregressive process in both sub samples can be rejected at 5 percent for 1970:2-1984:4 and at 1 percent for 1985:2-1999:4.

Table 4: Augmented Dickey-Fuller Unit-Root Tests

First difference of the Variables	Lag-length of the variables in first differences		ADF Statistic		Significance level	
	1970:2-1984:4	1985:2-1999:4	1970:2-1984:4	1985:2-1999:4	1970:2-1984:4	1985:2-1999:4
Ln M	0	1	-1.63	-. 78	10%	10%
Ln (P_m/P_x)	0	0	-1.52	-2.73	10%	5%
Ln Y	0	0	-1.87	-. 06	10%	10%
Ln Y^e	1	0	-1.86	-. 18	10%	10%

28. The estimates of equation (10) (see table 3) indicate that, according to the values of the Ljung-Box's Q- or the Breusch-Godfrey's statistics, the hypothesis of white noise residuals cannot be rejected for the two sampling periods. Furthermore, the hypothesis of stability of coefficients is rejected as the value of the Wald test statistic $\chi^2(8)$ is calculated in (25.0) with a marginal probability of .15 percent[6]. The values of the White test for heteroscedastic disturbances are (37.6) for 1970:2-1984:4 and (40.6) for 1985:2-1999:4 with marginal significance levels of 35 and 24 percent, respectively, and the null hypothesis of homoscedasticity cannot thus be rejected.

29. The estimates of the coefficient of adjustment Υ for the two sub samples are statistically different from zero and less than one. This is an additional confirmation that the variables are cointegrated as short-run disequilibria tend to be eliminated in the long-run. To test the hypothesis of stability of this parameter over time, the value Wald test statistic is calculated in (.17) and this hypothesis cannot be rejected with a significance level of 5 percent.

30. According to the estimates of the long-run elasticity of the demand for imports with respect to the relative price of importable goods, this parameter has increased in absolute value from (-. 27) during the period 1970-84 to (-1.25) during the second period. The calculated Wald test statistic of (4.64) to test the hypothesis of equality of these two coefficients indicates that we can reject the null hypothesis of stability at 3 percent significance level[7].

31. For the 1995:2-1994:4 period, the long-run coefficient of the logarithm of real income (ln$Y$) is negative and statistically different from zero. This indicates that, during this period, economic growth has been biased against the volume of international trade. The estimated long-run coefficient of the aggregate expenditure variable (lnY^e) is positive and statistically different from zero at the usual significance levels and higher in absolute value than that of real income. The calculated F-statistic to test the null hypothesis of equality of the coefficients of these two variables is (5.80) and this hypothesis can thus be rejected at 5 percent significance level. Thus, the anti-trade bias of economic growth has been more than offset by the increase in aggregate demand during this period.

32. In order to analyze the sensitivity of the estimates of the long-run coefficients of equation (10) to the method of estimation, the equation is estimated with the method of S. Johansen (1991). According to this method, the number of cointegration equations (CE) is

tested by estimating an unrestricted vector autoregression that includes current and lagged values of the quantity of imports, and lagged values of the relative price of imports and of real output and aggregate expenditure.

33. The estimates of the vector autoregression with data covering the period 1985:2-1999:4 indicate that, according to the Schwarz criterion, the hypothesis of an autoregression of order one cannot be rejected. Furthermore, the value of the Johansen test statistic to test the number of CEs indicates that the hypothesis of one cointegration equation cannot be rejected (see table 5 below) at 5 percent significance level.

Table 5: Johansen Cointegration Test – 1995:2-1999:4

Eigenvalue	Likelihood Ratio	5% Critical Value	1% Critical Value	Hypothesized N° of CEs
0.408694	53.42058	53.12	60.16	None *
0.211982	22.42073	34.91	41.07	At most 1
0.093791	8.36491	19.96	24.60	At most 2
0.042369	2.55428	9.24	12.97	At most 3

Note: *(**) denotes rejection of the hypothesis at 5%(1%) significance level.
The LR test indicates one cointegration equation at 5% significance level.
The VAR(1) assumes no deterministic trend.

34. The estimates of the long-run coefficients of the import demand equation and of the adjustment coefficient are close to the ones obtained with the equilibrium correction approach as shown below (the numbers below the coefficients are the t-statistics):

$$\Delta \ln M = -.26[\ln M_{t-1} - \underset{(-6.82)}{(-9.11)} - \underset{(-2.05)}{(-1.69)}\ln(P_m/P_x)_{t-1} - \underset{(-4.53)}{(-5.10)}\ln y_{t-1} - \underset{(-2.55)}{(6.56)}\ln y^e_{t-1}]$$
$$\underset{(3.99)}{}$$

R^2=.41 Q(4)=3.47 (.49) Q(8)=12.31 (.14)

These estimates are close to the ones obtained with the approach of equilibrium correction of table 3 with 1995:2-1999:4 data.

III. A Quantitative Assessment of the Trade Policies of the 90s

35. In this section, the increase in the 1995-1999 average quantity of imports over the average of 1985-89 is decomposed according to its sources:

(i) Aggregate expenditure and real output effects holding constant the average 1985-89 domestic relative prices of importable vis-à-vis exportable goods;
(ii) Changes in commercial policies holding constant the external terms of trade of 1985-89 and aggregate expenditure and real output at their average values of 1995-99; and,
(iii) Changes in the external terms of trade.

36. To this effect, the long-run estimates of the import demand function for the period 1985:2-1999:4 of table 3 are used along with the measures of the equivalent import tax rates for 1985-89 and for 1995-99. The results (see table 6) show that changes in expenditure and real output are responsible for a 50 percent of the increase in the volume of imports while changes in commercial policies account for about 25 percent.

Table 6: Sources of the Increase in Imports – 1985:2-1999:4 Long-Run Coefficients of Table 3

Quantity of Imports	Predicted Values	Actual Values
Predicted 1985-89 imports	30.2	29.9
Predicted 1995-99 imports	149.1	153.3
Of which:		
% due to expenditure-output effects	52.6	50.7
% due to changes in external terms of trade	23.5	22.7
% due to changes in commercial policies	23.9	26.6

35. Using the results of the estimation of the import demand equation according to the Johansen method (see table 7), the sources of the increase in imports are more uniformly distributed than those of the table 6. In particular, changes in commercial policies and in expenditure-output account for 32 and 34 percent of the total predicted change in the quantity of imports.

Table 7: Sources of the Increase in Imports – Johansen Method of Estimation

Quantity of Imports	Predicted Values
Predicted 1985-89	43.9
Predicted 1995-99	155.0
Of which:	
% due to expenditure-output effects	34.2
% due to changes in external terms of trade	33.9
% due to changes in commercial policies	31.9

37. In section I, it was found that the equivalent tax on trade during the second half of the 90s has been substantially higher than during the second half of the 30s and during the 20s. What is the welfare cost of the current rates of protection in Argentina? Using the estimates of the long run coefficients of the demand for imports of table 3, the change in the quantity of imports in response to changes in commercial policies can be predicted holding constant the averages of aggregate expenditure and real output, and of the external terms of trade of the 1995-99 period.

38. If the average equivalent tax on trade of 1995-99 of 78 percent (compared to that of 1935-39) were eliminated, then it is estimated that the volume of imports would increase by 106 percent, from 9 percent of GDP to 18 percent. The welfare cost of the 1995-99 level of taxation of international trade compared to that of the 1935-39 period is estimated in about 4 percent of GDP. On the other hand, if the commercial policies of the 90s were those of the second half of the 20s, then imports would increase by about 140 percent to 22 percent of GDP and the welfare cost of current trade policies is estimated at about 6 percent of GDP.

IV. Final Remarks

39. According to our estimates, efforts were made to liberalize trade during the 90s as indicated by the decline in prices of import-competing goods compared to prices of exportable goods of about 25 percent compared to the relative prices of the 1985-89 period. These policies have led to an increase in the volume of imports of about 30 percent. However, the data indicates that, compared to other experiments of trade liberalization such as the 1979-1980 or 1968-70 policy episodes, this attempt to liberalize trade has been rather timid in practice. The estimates of the equivalent tax on trade indicate that taxation of international trade could reach 78 percent compared to the commercial policies of the second half of the 30s or 100 percent compared to those of the 20s.

40. The estimates presented in this paper indicate that the main factors explaining the increase in the volume of imports over that of the 80s have been the increases in aggregate expenditure and in real output. The extent to which the increase in real output and aggregate expenditure during the 90s over their levels during the 80s has been the result of trade liberalization or the outcome of broader liberalization policies such as deregulation of the economy and privatization of state-owned enterprises, and of macroeconomic stability is an open question.

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FOOTNOTES

(1) In Sjaastad, L. and C. Rodríguez (1979), and in L. Sjaastad (1981), these goods are treated as non-traded goods and thus affected by commercial policies through substitution effects in production and consumption.

(2) The year 1976 is included in the average to avoid any effect of price controls on the measure of commercial policies. These controls were in place during 1973-1975 and were lifted afterwards.

(3) The number of lags is selected by minimizing the value of the Schwarz statistic. The value of the ADF statistic is –3.39 with two lags of the first difference of the residuals compared to a critical value at 5 and 10 percent of –2.89 and –2.58, respectively.

(4) See Appendix for the derivation of equation (9).

(5) The lag length is determined on the basis of minimizing the value of the Schwarz statistic.

(6) The Wald statistic is (b0-b1)´(V0+V1)(b0-b1) and is asymptotically distributed as χ^2 under the assumption of normality and independence of the estimates of the coefficients with degrees of freedom equal to the number of parameters for which stability is tested. The vectors b0 and b1 are those of the estimated coefficients for the two subsamples, and V0 and V1 are the estimates of the coefficient covariance matrices.

(7) The Wald statistic is distributed as χ^2 with one degree of freedom.

Appendix

Derivation of Equation (7)

Consider the following autorregressive representation of a variable *Y*:

$$\text{(A1)}\quad Y_t = a0 + a1Y_{t-1} + a2Y_{t-2} + a3Y_{t-3} + b0X_t + b1X_{t-1} + b2X_{t-2} + b3X_{t-3} + \varepsilon_t$$

Substracting Y_{t-1} from both sides of (A1), and adding and substracting specific terms, the following equation is obtained:

$$\begin{aligned}\text{(A2)}\quad Y_t - Y_{t-1} = {} & a0 + a1Y_{t-1} - Y_{t-1} + (a2Y_{t-1} - a2Y_{t-1}) + (a3Y_{t-1} - a3Y_{t-1}) + a2Y_{t-2} + \\ & + (a3Y_{t-2} - a3Y_{t-2}) + a3Y_{t-3} + b0X_t + (b0X_{t-} - b0X_{t-1}) + b1X_{t-1} + \\ & + (b2X_{t-1} - b2X_{t-1}) + (b3X_{t-1} - b3X_{t-1}) + b2X_{t-2} + (b3X_{t-2} - b3X_{t-2}) + b3X_{t-3} + \varepsilon_t\end{aligned}$$

Rearranging (A2) and collecting terms, the following equations are obtained:

$$\begin{aligned}\text{(A3)}\quad \Delta Y_t = {} & a0 + \left(\sum_{j=1}^{3} a_j - 1\right) Y_{t-1} + \sum_{j=0}^{3} b_j X_{t-1} - (a2 + a3)\Delta Y_{t-1} - a3\Delta Y_{t-2} + \\ & + b0\Delta X_t - (b2 + b3)\Delta X_{t-1} - b3\Delta X_{t-2} + \varepsilon_t\end{aligned}$$

$$\text{(A4)}\quad \Delta Y_t = a0 + \left(\sum_{j=1}^{3} a_j - 1\right)\left(Y_{t-1} - \left(\frac{\sum_{j=0}^{3} b_j}{1 - \sum_{j=1}^{3} a_j}\right) X_{t-1}\right) - (a2 + a3)\Delta Y_{t-1} - a3\Delta Y_{t-2} +$$

$$+ b0\Delta X_t - (b2 + b3)\Delta X_{t-1} - b3\Delta X_{t-2} + \varepsilon_t$$

A generalization of (A4) for more variables is equation (10) in the text.