

## U.S.-Latin American Trade Flows: 1967-1985

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This paper studies U.S.-Latin American (L.A.) trade flow trends for the period 1967-1985. Since the trade flows between some individual countries and the U.S. are of particular importance, and since the policies and performance of these countries varied substantially, the same trend equations were estimated for the U.S., -Mexico, -Argentina, -Brazil, and, -Rest of Latin America (ROLA) trade flows. In the 1980's the U.S. was experiencing a general decline in international competitiveness in its traditional export sectors and L.A. was developing comparative advantages in non-traditional sectors. U.S. trade with L.A. expanded throughout the 1967-1985 period with the greatest expansion being with ROLA and Mexico, respectively. Remarkably, U.S. imports from ROLA and Mexico have grown at a faster rate than those from Brazil, the acknowledged L.A. export leader.

### I. Introduction

This paper studies U.S.-Latin American (L.A.) trade flow trends for the period 1967-1985. These years represent a relatively long and significant period of time in the economic development of the countries under study and also an important period in the trade relationship between the U.S. and Latin America. This period covers several phases of the world business cycle in terms of both output and trade, including strong growth years and years of retrenchment and negative growth. It includes the period when severe price shocks on the world oil markets caused tremors

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were used. Total U.S. exports to L.A. and U.S. exports for the ten categories of the SITC one digit classification were used (Table 1). To study the L.A. exports to the U.S., the U.S. import data at similar level of disaggregation were used (Table 2).<sup>2</sup> Since the trade flows between some individual countries and the U.S. are of particular importance, and since the policies and performances of these countries varied substantially, the same trend equations were estimated for the U.S.-Argentina, U.S.-Brazil, U.S.-Mexico, and U.S.-Rest of Latin America (ROLA) trade flows (Table 3). Furthermore, since the period covered by the data includes the 1980s crisis, it was considered appropriate to estimate trends for the 1967-1985 period as a whole (Equation A) and for the 1967-1980 subperiod (Equation B). Another estimation for the whole period, including a dummy variable for the 1981-1985 years was also made (Equation C).

### III. Empirical Analysis

#### *A. Total U.S.-L.A. Trade Flows (These trend estimates are summarized in Tables 1 and 2)*

Between 1967-1985 (Equation 1) the rate of growth of U.S. imports from L.A. outpaced exports with imports growing at a 8.8% annual rate compared to a 5.7% rate of growth for exports. The exceptions to this trend were SITC categories: 0, Food and Live Animals; 2, Inedible Crude Materials except fuels; and 4, Animal and Vegetable Oils and Fats, i.e., agricultural and primary commodity based products. However, if we exclude the 1981-1985 period from the time series (Equation 2) the rate of growth of trade between the U.S. and L.A. was more balanced with U.S. imports growing at an 11.9% annual rate compared to a 10.7% rate for exports. Thus, while L.A. grew, trade in both directions grew at a high and similar rate, increasing the interdependence between the U.S. and the L.A. region. During this shorter period, SITC categories in which the rate of growth of U.S. exports exceeded the rate of imports were the same as mentioned above, and also included SITC categories: 5, Chemicals; and 6, Manufactured Goods by Chief Material.

The long term rate of growth of the OECD countries declined after the late 1960s, a trend which was reinforced by their conservative reaction to the 1973 oil price increase. During this period L.A. growth continued healthy due in part to very heavy external borrowing. Thus, the L.A.

<sup>2</sup> All the data were deflated by the corresponding exports and imports implicit price deflators used in the U.S. Gross National Product Accounts.

Table 1 (continued)

SITC	Equation (1) 1967-1985		Equation (2) 1967-1980		Equation (3) 1967-1985 plus Dummy	
	Rate of Growth	R <sup>2</sup>	Rate of Growth	R <sup>2</sup>	Rate of Growth	Dummy coefficient
7. Machinery & transport equipment	13.0 <sup>d</sup>	0.98	13.9 <sup>c</sup>	0.98	13.5 <sup>d</sup>	b
8. Misc. manuf. articles	8.5 <sup>c</sup>	0.96	23.1 <sup>c</sup>	0.90	22.5	-0.89
9. Other commodities & goods, N.E.C.	6.7 <sup>c</sup>	0.95	8.6	0.96	8.2	b

a t-statistic insignificant at the 0.05 probability (all other t's significant at the 0.01 critical probability)

b Dummy variable coefficient insignificant

c Durbin-Watson statistic was initially less than critical value at the 0.05 level of significance, i.e., positive autocorrelation was suspected. Applied Cochran-Orcutt two-step auto-regressive iterative process of order one to correct for positive autocorrelation

d Durbin-Watson statistic was initially less than critical value at the 0.05 level of significance, i.e., positive autocorrelation was suspected. Applied Cochran-Orcutt two-step auto-regressive iterative process of order two to correct for positive autocorrelation

e Durbin-Watson statistic was initially less than critical value at the 0.05 level of significance, i.e., positive autocorrelation was suspected. An attempt to correct for positive autocorrelation resulted in t-statistic being insignificant.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 2 (continued)

SITC	Equation (1) 1967-1985		Equation (2) 1967-1980		Equation (3) 1967-1985 plus Dummy		
	Rate of Growth	$\bar{R}^2$	Rate of Growth	$\bar{R}^2$	Rate of Growth	Dummy coefficient	
7. Machinery & transport equipment	5.6 <sup>d</sup>	0.68	11.3 <sup>d</sup>	0.97	9.4	0.69	-0.56
8. Misc. manuf. articles	6.3 <sup>d</sup>	0.89	10.2	0.97	6.0 <sup>d</sup>	0.86	b
9. Other commodities & goods, N.E.C.	2.9 <sup>d</sup>	0.41	5.4 <sup>d</sup>	0.55	8.6	0.49	-0.62

a t-statistic insignificant at the 0.05 probability (all other t's significant at the 0.01 critical probability)

b Dummy variable coefficient insignificant

c Durbin-Watson statistic was initially less than critical value at the 0.05 level of significance, i.e., positive autocorrelation was suspected. Applied Cochran-Orcutt two-step auto-regressive iterative process of order one to correct for positive autocorrelation

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e Durbin-Watson statistic was initially less than critical value at the 0.05 level of significance, i.e., positive autocorrelation was suspected. An attempt to correct for positive autocorrelation resulted in t-statistic being insignificant.

f Durbin-Watson statistic was initially less than critical value at the 0.05 level of significance, i.e., positive autocorrelation was suspected. Applied Cochran-Orcutt two-step auto-regressive iterative process of order three to correct for positive autocorrelation.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3 (continued)

SITC	US-ARGENTINA				US-BRAZIL				US-MEXICO				US-REST OF LATIN AMERICA			
	US EXPORTS		US IMPORTS		US EXPORTS		US IMPORTS		US EXPORTS		US IMPORTS		US EXPORTS		US IMPORTS	
	Rate of $\bar{R}^2$ Growth	Rate of $\bar{R}^2$ Growth	Rate of $\bar{R}^2$ Growth	Rate of $\bar{R}^2$ Growth	Rate of $\bar{R}^2$ Growth	Rate of $\bar{R}^2$ Growth	Rate of $\bar{R}^2$ Growth	Rate of $\bar{R}^2$ Growth	Rate of $\bar{R}^2$ Growth	Rate of $\bar{R}^2$ Growth	Rate of $\bar{R}^2$ Growth	Rate of $\bar{R}^2$ Growth	Rate of $\bar{R}^2$ Growth	Rate of $\bar{R}^2$ Growth	Rate of $\bar{R}^2$ Growth	
7. Machinery & transport equipment	4.2 <sup>d</sup>	0.76 <sup>a</sup>	7.2	0.51	0.35 <sup>c</sup>	0.17	16.8 <sup>d</sup>	0.95	9.1 <sup>d</sup>	0.84	12.6 <sup>c</sup>	0.98	8.0 <sup>d</sup>	0.91	19.7 <sup>c</sup>	0.98
8. Miscellaneous manuf. articles	5.1 <sup>d</sup>	0.61 <sup>a</sup>	13.5 <sup>e</sup>	0.47	-7.6 <sup>c</sup>	0.75 <sup>a</sup>	14.0 <sup>d</sup>	0.95	7.7 <sup>d</sup>	0.82	6.6 <sup>c</sup>	0.88	10.8 <sup>d</sup>	0.97	20.9 <sup>d</sup>	0.99
9. Other commodities & goods, N.E.C.	8.1 <sup>d</sup>	0.74	5.4	0.30	5.4 <sup>d</sup>	0.54	11.6	0.94	-5.8 <sup>e</sup>	0.33	8.0 <sup>c</sup>	0.95	8.1 <sup>b</sup>	0.77	11.4 <sup>d</sup>	0.94

a t-statistic insignificant at the 0.05 probability (all other t's significant at the 0.01 critical probability)

b Dummy variable coefficient insignificant

c Durbin-Watson statistic was initially less than critical value at the 0.05 level of significance, i.e., positive autocorrelation was suspected. Applied Cochrane-Orcutt two-step auto-regressive iterative process of order one to correct for positive autocorrelation

d Durbin-Watson statistic was initially less than critical value at the 0.05 level of significance, i.e., positive autocorrelation was suspected. Applied Cochrane-Orcutt two-step auto-regressive iterative process of order two to correct for positive autocorrelation

e Durbin-Watson statistic was initially less than critical value at the 0.05 level of significance, i.e., positive autocorrelation was suspected. An attempt to correct for positive autocorrelation resulted in t-statistic being insignificant.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Miscellaneous Manufactured Articles, in addition to SITC 2 and 4 of Equation (1).

When the Dummy variable for the years 1981-1985 (Equation 3) is included, the  $\bar{R}^2$  for imports once again exceeds that of exports with a value of 0.94 versus 0.83 respectively. With SITC categories 2 and 4 once again being the only exceptions. Although the dummy variable has reduced the differentiation between export and import trends, it is clear that the 1980s witnessed a weakening in the trend of U.S. exports to Latin America with no apparent weakening in U.S. imports from L.A.

The t-statistic for Equations (1), (2), and (3) for exports and imports were in general high and significant at the 0.01 critical probability, with the t-'s for the import equations in general supporting our observations based on the  $\bar{R}^2$ 's.

The uncorrected Durbin-Watson statistics in Equation (1) for both U.S. imports from and exports to L.A. were low for the period 1967-1985 with a value of 0.79 for imports and 0.43 for exports. This is well below the critical value of 1.06 at the 0.05 level of significance leading us to suspect that positive autocorrelation is present in the time series. This implies that while trade flows in both directions have been cyclical, U.S. exports have been more cyclical than imports. This result is contrary to the commonly held view that L.A. exports are subject to high cyclical fluctuations due to the OECD countries' business cycle. While that could be the case for individual commodities, it is not so in the aggregate.

In order to correct for the low Durban-Watson statistic we applied the Cochrane-Orcutt two-step auto-regressive iterative process of order one, and where necessary of order two, to correct for positive autocorrelation. The Cochrane-Orcutt corrective processes were applied successfully in all cases except for exports of SITC 6, Chemicals, where the correction process resulted in an insignificant t-statistic. As a result of the correction the Durban-Watson statistic rose to 1.76 for imports and 1.72 for exports.

In Equation (2) when the problem years of 1981-1985 are excluded from the time series the uncorrected D-W statistic rises to 1.37 for imports and 1.06 for exports. While exports continue to be more cyclical than imports, the D-W statistic for exports is now indeterminate at the 0.05 level of significance while no autocorrelation is now suspected for imports. The exception for imports being SITC categories: 1, 7 and 8; and for exports, SITC categories: 0, 1, 7, and 9 which are now also suspected of positive autocorrelation. In all cases a correction was made for positive autocorrelation with the sole exception of imports of SITC 8, Miscellaneous Manufactured Articles, which resulted in an insignificant t-statistic.

U.S.-L.A. trade relationship appear to have their origins on the L.A. side, it was decided that a more disaggregated approach was in order. In this regard U.S. trade with L.A. was disaggregated into trade with Argentina (AR), Brazil (BR), Mexico (MX), and the Rest of Latin America (ROLA).

The rate of growth of U.S. exports and imports to and from AR, BR, MX, and ROLA are in general consistent with the figures for total U.S. exports and imports, with the rate of growth of imports from AR, BR, MX, and ROLA, greater than that of exports to AR, BR, MX, and ROLA. The rank order of growth rates was consistent for both imports and exports with the fastest growth rate for imports from MX, followed by ROLA, BR, and AR, in rank order, i.e., 14.2%, 11.1%, 10.0%, and 7.4% respectively; and 9.4%, 9.1%, 4.1%, and 1.8% respectively for U.S. exports. Thus U.S. trade with L.A. was expanding throughout the 1967-1985 period with the greatest expansion being with MX and ROLA respectively.

### *Mexico*

Although the rate of growth of U.S. imports from MX was 14.2% versus 9.4% for exports there was variation at a more disaggregated SITC level with the rate of growth of imports from MX exceeding that of exports in SITC categories: 1, 2, 5, 7, and 9. U.S. imports from MX exceeded the average rate of growth of 14.2% in SITC categories 3. U.S. exports to MX exceeded the average rate of growth of 9.4% in SITC categories: 0, 2, 4, and 6. Once again we see indications of a fast growth of U.S. Manufacturing imports and slower Natural Resource Based Products' imports, showing a changing comparative advantage. MX exports of manufactures were becoming increasingly competitive and were making significant inroads in the U.S. market during this time period. Many of these exports were in products of U.S. sunset industries.

### *Rest of Latin America*

Likewise, while the rate of growth of U.S. imports from ROLA exceeded that of exports by a rate of 11.1% versus 9.1%, variation existed at a more disaggregated level with the rate of growth of imports from ROLA exceeding that of exports in SITC categories: 1, 5, 6, 7, 8 and 9. U.S. imports from ROLA exceeded the average rate of growth of 11.1% in SITC categories: 1, 3, 5, 6, 7, 8 and 9. U.S. exports to ROLA exceeded the average rate of growth of 9.1% in SITC categories: 0, 2, 3, 4, 5 and 8. With the fastest rate of growth of imports being in manufactures while in exports it is in agricultural and natural resource based products. ROLA during this period demonstrated increased competitiveness in manufac-

groupings. In terms of the composition of imports from AR, BR, MX and ROLA, the rate of growth of imports exceeded the average within each country grouping for SITC categories: 1, 3, 6, and 8, in at least 3 of the 4 country groupings. In terms of the composition of exports to AR, BR, MX and ROLA, the rate of growth of exports exceeded the average within each country grouping for SITC categories: 0, 2, 3, and 4, in at least 3 of the 4 country groupings.

All U.S. import equations have better fits than those for U.S. exports. The  $\bar{R}^2$  coefficients for U.S. imports from AR, BR, MX and ROLA are high, i.e., 0.79, 0.96, 0.97 and 0.92 respectively with t-statistics that are significant at the 0.01 critical probability. The relatively lower  $\bar{R}^2$  for AR indicates that domestic factors in Argentina were arresting export growth during this period relative to the rest of L.A. In contrast, the  $\bar{R}^2$  coefficients for U.S. exports to AR, BR, MX and ROLA vary, i.e., 0.65, 0.23, 0.76 and 0.94 respectively. The  $\bar{R}^2$  coefficients for exports are lower than those for imports for AR, BR and MX, and in particular for exports to AR and BR, with the t-statistic significant only at the 0.10 critical probability in the case of AR.

Likewise the uncorrected D-W statistics for U.S. imports from AR, BR, MX and ROLA are higher than those for U.S. exports to AR, BR, MX and ROLA respectively. Only the D-W statistic for U.S. imports for AR and BR was above the critical value at the 0.05 level of significance leading us to suspect that positive autocorrelation is present in the time series for U.S. imports from MX and ROLA and in U.S. exports to AR, BR, MX and ROLA. Once again in order to correct for the low D-W statistic we applied the Cochrane-Orcutt corrective process of order one, and where necessary of order two, to correct for positive autocorrelation. The Cochrane-Orcutt correction procedure was successful in all cases except for imports from AR, SITC 8; exports to BR, SITC 2, 5 and 7; and exports to MX, SITC 9: in which cases the correction process resulted in an insignificant t-statistic.

U.S. trade with AR has been the most cyclical compared to the other country groupings with U.S. exports to AR being more volatile than imports. In addition to the overall cyclical trends that characterized the aggregate time series for U.S.-L.A. trade with the pivotal years of 1973 and 1980, we now see emerging two additional trends particular to U.S. trade with AR indicating a change in trade regime around the years 1969 and more clearly 1976. U.S. exports to AR expanded sharply in the 1976-1980 period only to decline precipitously in the 1981-1985 period. The 1976-1980 period is well known in Argentina as this was the time of the neo-liberal experiment under Martinez de Hoz which resulted in a



pact of an increasingly overvalued dollar on U.S. exports causing a general decline in international competitiveness of U.S. exports.

(c) U.S. exports to L.A. appear to have grown mostly in agricultural and natural resource based products while U.S. imports from L.A. grew faster in manufactured goods.

(d) In the 1980s the U.S. was experiencing a general decline in international competitiveness in its traditional export sectors and L.A. was developing comparative advantages in non-traditional sectors.

(e) While trade flows in both directions have been cyclical, U.S. exports have been more cyclical than imports — implying that domestic economic factors in L.A. might be more of a factor in this trade relationship than U.S. domestic economic variables.

(f) The more disaggregated the trade data the more volatile are the trade flows in both directions with U.S. exports always more volatile than imports.

(g) The data revealed two major inflexion points in U.S.-L.A. trade flows associated with the years 1973-74 and 1980-81. In addition another inflexion point emerged for 1969 relating to U.S. imports.

(h) U.S. trade with L.A. was expanding throughout the 1967-85 period with the greatest expansion being with MX and ROLA respectively. Remarkably, U.S. imports from MX and ROLA have grown at a faster rate than those from BR, the acknowledged L.A. export leader.

(i) 1976 emerged as a fourth inflexion point in the U.S.-AR trade relationship with AR domestic factors appearing as the main determinants.

(j) 1977 emerged as a fourth inflexion point in the U.S.-BR trade relationship with BR domestic factors appearing as the major determinants.

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