China and the Recent Evolution of Latin America's Manufacturing Exports

Gordon H. Hanson, UCSD and NBER

Raymond Robertson, Macalester College

August 2006

Abstract. In this paper, we use the gravity model of trade to decompose Latin America's export growth into components associated with export-supply capacity, import-demand conditions, and other factors. Some have argued that Latin America's recent sluggish export performance is due to China's expansion in global markets. Others have cited Latin America's inability to make needed economic reforms, which have hurt the country's competitiveness in manufacturing. Our results suggest that negative import-demand shocks associated with both China and the U.S. economy have contributed to the slowdown in Latin America's export growth.

We thank David Hummels, Pravin Krishna, Ernesto Lopez Cordoba, Marcelo Olarreaga, Guillermo Perry, Christian Volpe, and seminar participants at the Brookings Institution, George Washington University, the Inter-American Development Bank, UC Davis, and the World Bank for comments.

1. Introduction

In the 1980s and 1990s, international trade became the engine of growth for Latin America's economy. The implementation of the Common Market of the Southern Cone (Mercosur) and the North American Free Trade Agreement (NAFTA), aggressive unilateral reforms, and a sustained economic expansion in the United States all contributed to a surge in Latin America's manufacturing exports.

In this paper, we decompose Latin America's export performance into components associated with export-supply capabilities and import-demand conditions. We focus on Latin America's four largest manufacturing exporters, Argentina, Brazil, Chile, and Mexico. One component of export growth is changes in demand among countries that are an exporter's primary markets. If Latin America's main destination markets expand, the country's exports will tend to grow. A second component is changes in a country's capacity to export (relative to other countries), which is determined by its production costs and the size of its industrial base. A third component is changes in the export-supply capabilities of the specific countries that also trade with a country's main trading partners. If the countries with the largest expansion in export capacity are those that trade heavily with the United States – Latin America's largest trading partner – Latin American exports may be squeezed out of foreign markets. Naturally, the relative importance of demand and supply factors is likely to vary across industries, countries, and time. Our framework, which extends the gravity model of trade in Anderson and Van Wincoop (2004), provides an industry-by-industry decomposition of national export growth.

In section 2, we use a standard monopolistic-competition model of trade to develop an estimation framework. The specification is a regression of bilateral sectoral exports on importer country dummies, exporter country dummies, and factors that affect trade costs (bilateral distance, sharing a land border, sharing a common language, belonging to a free trade area, import tariffs). When these importer and exporter dummies are allowed to vary by sector and by year, they can be interpreted as functions of structural parameters and country-specific prices and income levels that determine a country's export supply and import demand. We decompose manufacturing export growth for Argentina, Brazil, Chile, and Mexico into four components: (a) changes in sectoral export-supply capacity, (b) changes in import-demand conditions in a country's trading partners, (c) changes in trade costs, and (d) residual factors. Changes in import-demand conditions can, in turn, be decomposed into two parts, one of which captures changes in income levels in import markets and another of which captures changes in sectoral import price indices for those markets, which are themselves a function of other countries' export-supply capacities.

In section 3, we report estimates based on our framework. The data for the analysis come from the UN Comtrade database and cover the period to 1995 to 2004. We begin by reporting estimated sectoral exporter dummy variables for the four Latin American economies vis-à-vis China and the United States. The results describe how Latin America's export-supply capacities in different industries evolve over time. Latin America's export capabilities tend to be relatively strong in the same industries in which China's export capabilities are also strong, suggesting the region is relatively vulnerable to export-supply shocks in China. Since 1994, China's export capabilities have improved relative to most of Latin America's large export manufacturing industries.

We then decompose changes in Latin American exports into components associated with changes in Latin America's export-supply capacities, changes in import-demand conditions, changes in trade costs, and changes in residual factors. While changes in Latin America's export-supply capacities have contributed to growth in exports, changes in Latin America's import-demand conditions have not, at least since 2000. To explore why import-demand conditions have not been more favorable, we examine two sources of negative import-demand shocks: China's growth in export supply, which may have lowered import prices in destination markets and diverted import demand away from Latin America; and the slow down in the growth of the U.S. economy, which may have reduced growth in demand for the region's exports. The results suggest that had China's export-supply capacity remained constant after 1995, exports for the four Latin American countries would have been 0.5 to 1.2 percentage points higher during the 1995-2000 period and 1.1 to 3.1 percentage points higher during the 2000-2004 period. Had U.S. GDP growth been the same over the 2000-2004 period as it was over the 1995-2000 period, Latin American exports would have been 0.2 to 1.4 percentage points higher.

The results hold at least three important lessons for policy makers. First, part of the fluctuation in Latin America's manufacturing exports appears to be associated with fluctuations in the U.S. economy. If the U.S. economy continues to recuperate, so too will demand for Latin American goods on the world market. Since part of Latin America's export sluggishness is due to cyclical fluctuations, it is likely to be temporary in nature. However, this consideration matters more for Mexico than for other countries in the region. Second, the growth in Latin America's export-supply capacities has slowed considerably since the late 1990s. Part of the stagnation in the growth in Latin American manufacturing exports is attributable to an inability on Latin America's part to expand the factors of production that generate export growth. Third, for the time being export growth in China is likely to have adverse consequences on the demand for Latin American manufacturing exports. For better or worse, Latin America's most important export industries (and particularly those of Mexico) are also those in which China's appears to have relative strong export capabilities. Given that patterns of national export specialization tend to change slowly over time, Latin America's vulnerability to China appears unlikely to diminish in the near term.

An important caveat to our results is that we focus exclusively on manufacturing exports. In some countries, notably Brazil and Chile, the growth of China's economy has increased demand for commodity exports. The impact of China on Latin America's commodity exports does not enter our analysis, making our results partial equilibrium in nature. The gravity model we develop, which is based on a monopolistic competition model of trade, would not be appropriate for examining agriculture, mining, or other sectors that produce primary commodities. Thus, our results do not constitute an analysis of the aggregate impact of China on Latin American exports.

2. Empirical Specification

2.1 Theory

Consider a standard monopolistic model of international trade, as in Anderson and van Wincoop (2004) or Feenstra (2004). Let there be J countries and N manufacturing sectors, where each sector consists of a large number of product varieties. All consumers have identical Cobb-Douglas preferences over CES sectoral composites of product varieties, where in each sector n there are I_n varieties of n produced with country h producing I_{nh} of these varieties. There are increasing returns to scale in the production of each variety. In equilibrium each variety is produced by a single monopolistically-competitive firm and I_n is large, such that the price for each variety is a constant markup over marginal cost. Free entry drives profits to zero, equating price with average cost.

Consider the variation in product prices across countries. We allow for iceberg transport costs in shipping goods between countries and for import tariffs. The c.i.f. price of variety i in sector n produced by country j and sold in country k is then

$$P_{injk} = \left(\frac{\sigma_n}{\sigma_n - 1} \right) w_{nj} t_{nk} (d_{jk})^{\gamma_n} \tag{1}$$

where P_{inj} is the f.o.b. price of product i in sector n manufactured in country j; σ_n is the constant elasticity of substitution between any pair of varieties in sector n; w_{nk} is unit production cost in sector n for exporter j; t_{nk} is one plus the ad valorem tariff in importer k on imports of n (assumed to be constant across exporters that do not belong to a free trade area with importer k); d_{jk} is distance between exporter j and importer k; and γ_n is the elasticity of transportation costs with respect to distance.

Given the elements of the model, total exports of goods in sector n by exporter j to importer k can be written as,

$$X_{njk} = \mu_n Y_k I_{nj} P_{njk}^{1-\sigma_n} G_{nk}^{\sigma_n - 1}, \tag{2}$$

where μ_n is the expenditure share on sector n and G_{nk} is the price index for goods in sector n in importer k. Hanson and Robertson (2006) show that equation (2) reduces to

$$X_{njk} = \frac{\mu_n Y_k I_{nj} \left(w_{nj} \tau_{nk}^{-1[jk]} (d_{jk})^{\gamma_n} \right)^{1-\sigma_n}}{\sum_{h=1}^{H} I_{nh} \left[w_{nh} \tau_{nk}^{-1[hk]} (d_{hk})^{\gamma_n} \right]^{1-\sigma_n}}. \tag{3}$$

where 1[jk] is an indicator variable that takes a value of one if countries j and k belong to a free trade area and zero otherwise.

Taking logs and regrouping terms in (3) we obtain,

$$\ln X_{njk} = \theta_n + m_{nk} + s_{nj} + \beta_{1n} \ln d_{jk} + \beta_{2n} 1[jk] + \beta_3 1[jk] \ln \tau_{jk} + \varepsilon_{njk}, \qquad (4)$$

In equation (4), we see that there are four sets of factors that affect country j's exports to country k in sector n. The first term captures preference shifters specific to sector n; the second term captures demand shifters exporter j faces in sector n and importer k (which are a function of importer k's income and supply shifters for other countries that also export to importer k); the third term captures supply shifters in sector n for exporter j (which reflect exporter j's production costs and its industrial capacity in the sector); and the fourth through sixth terms capture trade costs specific to exporter j and importer k associated with bilateral distance, sharing a common language, sharing a land border, belonging to a free trade area, and import tariffs. Exporter j's shipments to importer k would expand if importer k's income increases, production costs increase in other countries that supply importer k, exporter j's supply capability expands (due to lower production costs or an expanded industrial base), or trade costs between the two countries decrease.

2.2 Decomposing Export Growth

Using annual data on bilateral trade by sector for a large cross section of countries, we estimate the parameters in equation (4). We do not need data on the components of m_{nk} or s_{nj}. By estimating equation (4) sector by sector and year by year, we identify the m_{nk} terms by including importer-specific dummy variables as regressors and the s_{nj} terms by including exporter-specific dummy variables as regressors.

Since equation (4) includes a constant term (θ_n), the estimated coefficients can be interpreted as deviations from mean industry export or import values. Thus, m_{nk} is the deviation from sector-n mean import demand for importer k and s_{nj} is the deviation from sector-n mean supply for exporter j. As a practical matter, we do not observe a country's exports to itself. Consequently, the country we treat as the excluded category in (4), off which the constant term is estimated, must be excluded from both the set of export dummies *and* the set of import dummies. The interpretation of the constant term is thus the mean trade value (rather than the mean export or import value) for the excluded country, which in all regressions we designate as the United States.

The specification in equation (4) is quite general. Restrictions arise only when we attempt to interpret the importer and exporter dummies. For instance, we have assumed that within sectors product varieties are identical between countries. Quality may be an important dimension along which varieties vary, especially between higher-wage and lower-wage exporters (Schott, 2004; Hummels and Klenow, 2005). Thus, the s_{nj} terms may also embody cross-country differences in the quality of product varieties. When evaluating how these terms change over time, we need to be mindful that improving quality is an additional means through which countries can expand their export capabilities. To identify exporter and sector-specific product quality parameters, we would need to know import quantities (which are unreported for many countries) *and* the value of σ_n for each sector.

For year t, let the OLS estimates of equation (4) be given by $\tilde{\theta}_{nt}, \tilde{m}_{nkt}, \tilde{s}_{njt}, \tilde{\beta}_{nt}$, and $\tilde{\varepsilon}_{njkt}$. For exposition simplicity, we subsume all variables associated with trade costs into a single term, denoted by the distance variable. Shipments by exporter j to importer k in sector n and year t equal

$$X_{njkt} = e^{\tilde{\theta}_{nt} + \tilde{s}_{njt} + \tilde{m}_{nkt} + \tilde{\varepsilon}_{njkt}} d_{jk}^{\tilde{\beta}_{nt}}, \tag{5}$$

and total exports by exporter j in sector n and year t equal

$$X_{njt} = e^{\tilde{\theta}_{nt} + \tilde{s}_{njt}} \sum_{K=1}^{H} e^{\tilde{m}_{nkt} + \tilde{\varepsilon}_{njkt}} d_{jk}^{\tilde{\beta}_{nt}}. \tag{6}$$

From (5) and (6), we can isolate the sources of export growth by country and sector. We write the distance term compactly as though it were a single variable, whereas in truth we model trade costs as a function of bilateral distance, sharing a common language, sharing a land border, belonging to a free trade area (FTA), and import tariffs (which from equation (3) only appear for country pairs belonging to the same FTA).

One source of export growth is improvement in the supply capability of exporter j in sector n, relative to the average for all other countries, which is captured by the sectoral exporter dummy, s_{njt}. The exporter dummy captures in part exporter j's average comparative advantage in sector n. A second source of export growth is changes in import demand, which is a function of national income in an importer country and product prices in the importer, which are in turn a function of the production costs and industrial capacities of the exporting countries that supply the importer.

To decompose changes in exports into component parts associated with changes in export capabilities and changes in demand conditions, rewrite (6) as

$$X_{njkt} = e^{\tilde{\theta}_{nt}} e^{\tilde{s}_{njt}} e^{\tilde{m}_{nkt}} e^{\tilde{\varepsilon}_{njkt}} d_{jk}^{\tilde{\beta}_{nt}} \equiv \Theta_{nt} S_{njt} M_{nkt} E_{njkt} D_{njkt}. \tag{7}$$

For years t and t+s, define $\Delta Z \equiv Z_{t+s} - Z_t$ and $\overline{Z} \equiv 0.5 * (Z_{t+s} + Z_t)$. Since X_{njkt} is the product of five terms, there are 60 (5!/2) unique ways to decompose ΔX_{njkt}. For any individual component (Θ, S, M, D, or E), we take the mean across the possible decomposition terms. Changes in exports for exporter-importer pair jk in sector n are,

$$\Delta X_{njkt} = \Delta\Theta_{njt}\overline{SMDE}_{njk} + \Delta S_{njt}\overline{\Theta MDE}_{njk} + \Delta M_{nkt}\overline{\Theta SDE}_{njk} + \Delta D_{njkt}\overline{\Theta SME}_{njk} + \Delta E_{njkt}\overline{\Theta SMD}_{njk}, \qquad (8)$$

where $\overline{\Theta MDE}_{njk}$ is the mean across the 60 possible orderings of the 5 elements that compose trade values in (8) and so forth. For exporter j, the change in total exports can be written by summing across sectors (n) and importers (k) in (8),

$$\Delta X_{jt} = \sum_n\sum_k \Delta X_{njkt} = \sum_n\sum_k (\Delta\Theta_{njt}\overline{SMDE}_{njk} + \Delta S_{njt}\overline{\Theta MDE}_{njk} + \Delta M_{nkt}\overline{\Theta SDE}_{njk} + \Delta D_{njkt}\overline{\Theta SME}_{njk} + E_{njkt}\overline{\Theta SMD}_{njk}). \qquad (9)$$

The first term on the right of (9) is the change in exports for exporter j associated with changes in mean sectoral trade (designated to be that for the United States), the second term is the change in exports associated with changes in exporter j's supply capabilities, the third term is the change in exports associated with demand conditions in countries than import from exporter j, the fourth term is the change in exports associated with innovations in trade costs (or trade-cost elasticities), and the fifth term is residual sources of change in j's exports. Equation (9) is the basis for our decomposition results.

2.3 Decomposing Changes in Import-Demand Conditions

Returning to equation (3), it is apparent that a further decomposition of import-demand conditions facing country j is possible. In theory,

$$m_{nk} = \ln Y_k - \ln\left(\sum_{h=1}^{H} I_{nh} w_{nh}^{1-\sigma_n} \tau_{nh}^{-1[hk](1-\sigma_n)} d_{hk}^{\beta_n}\right). \qquad (10)$$

Thus, exporter j faces import-demand shocks due to changes in income and import prices in its trading partners, where import prices are a function of export-supply conditions in the countries that also export to country j's trading partners. One might consider estimating (4) subject to the constraint in (10). However, there are practical difficulties in imposing such a constraint. As is well known, there is zero trade at the sectoral level between many country pairs, especially in pairs involving a developing country. Tenreyro and Santos (2005) propose a Poisson pseudo-maximum likelihood (PML) estimator to deal with zero observations in the gravity model. In our application, this approach is subject to an incidental-parameters problem (Wooldridge, 2002). While in a Poisson model it is straightforward to control for the presence of unobserved fixed effects, it is difficult in this and many other nonlinear settings to obtain consistent estimates of these effects. Since, at the sectoral level, most exporters trade with no more than a few dozen countries, PML estimates of exporter and importer country dummies may be inconsistent.

Our approach is to estimate equation (4) using OLS for a set of medium to large exporters (OECD countries plus larger developing countries, which account for approximately 90% of world manufacturing exports) and larger importers (countries that account for approximately 90% of world manufacturing imports). For bilateral trade between larger countries, there are relatively few zero trade values. However, since we do not account explicitly for zero bilateral trade in the data, we are left with unresolved concerns about the consistency of the parameter estimates.[1]

Using (10), we modify (9) to decompose demand shifters that are specific to importer k (say, the United States) into a component associated with GDP in country k (e.g., U.S. business-cycle conditions) and a component associated with the import-price index in importer k, which is in turn a function of trade-cost-weighted export-supply shifters among the countries that export to importer k. In this framework, we can identify the contribution of

[1] Choosing larger countries may subject the specification to selection bias. See Helpman, Melitz, and Rubinstein (2004).

changes in, say, China's export capacity to changes in other countries' demand for imports. We can also perform counterfactual decompositions of export growth for Latin American countries (or other countries) in which we assess how export growth in the country would have been different if China's export dummies had remain unchanged (which then would have increased global demand for other countries' goods) or if U.S. GDP growth had remain unchanged (which would have affected its import demand).

These counterfactual decompositions are not general-equilibrium in nature. Altering China's growth in export supply would affect the export supply of all other countries, not just Latin America. Thus, the counterfactual decompositions we construct are likely to overestimate the impact of export growth in China on Latin American manufacturing exports. Our results are perhaps best seen as upper bounds of the possible impact of China on Latin America's manufacturing sector. Similar qualifications apply to the counterfactual decomposition in which we constrain US GDP growth to be constant.

3. Empirical Results

The data for the analysis come from the UN Comtrade database and cover manufacturing imports over the period 1995 to 2004. We examine bilateral trade at the four-digit harmonized system (HS) level. We limit the sample to the top 40 export industries in Brazil and Mexico and the top 20 export industries in Argentina and Chile.[2] This sample of industries accounts for over 85% of manufacturing exports in each of the four countries. We estimate the gravity equation in (4) on a year-by-year basis, allowing coefficients on exporter country dummies, importer country dummies, and distance to vary by sector and year. The output from the regression exercise is for each sector a panel of

[2] In later work, we will expand the sample to include more industries and countries.

exporter and importer country dummy variables, trade-cost coefficients, intercepts, and residuals. The country dummies are the deviation from the U.S. sectoral mean trade by year. For these coefficients to be comparable across time, the conditioning set for a given sector (i.e., the set of comparison countries) must be constant across time. For each sector, we limit the sample to bilateral trading partners that have positive trade in every year during the sample period (by only including consistent trading partners in the sample we introduce another potential source of selection bias into the estimation).

3.1 Estimates of Sectoral Export Supply Capacities

The regression results for equation (4) involve a large amount of output. In each year, we estimate over 10,000 country-sector exporter coefficients, over 5,000 country-sector importer coefficients, and over 90 trade-cost coefficients. To summarize exporter and import dummies compactly, Figures 1a and 1b plot kernel densities for the sector-country exporter and importer coefficients (where the densities are weighted by sector-country exports or imports). Figure 1a shows that most exporter coefficients are negative, consistent with sectoral exports for most countries being below the United States. Over the sample period, the distribution of exporter coefficients shifts to the right, suggesting other countries are catching up to the United States. The figure indicates by vertical lines weighted mean values for Mexico's exporter coefficients in 1994 (equal to -3.9), 2000 (equal to -2.6), and 2004 (equal to -2.1), which rise in value over time relative to the overall distribution of exporter coefficients, suggesting Mexico's export-supply capacity improves relative to other countries over the sample period. Mean exporter coefficients fall over time for Argentina (-0.21 in 1994 and -1.26 in 2004), Brazil (-0.12 in 1994 and -

0.68 in 2004), and Chile (0.29 in 1994 and -0.34 in 2004). Thus, among the four Latin American countries, only Mexico shows consistent average improvement in its manufacturing export capacity. This could reflect the importance of commodity exports for the countries other than Mexico. A commodity export boom could diminish manufacturing export capacity by driving up the price of immobile factors of production, such as labor and land. In Figure 1b, most importer coefficients are also negative, again indicating sectoral trade values for most countries are below those for the United States.

To provide further detail on the coefficient estimates, an appendix reports mean exporter and importer coefficients by country (across sectors and years) and the fraction of coefficient estimates that are statistically significant.[3] For the large majority of countries, exporter and importer coefficients are precisely estimated. Further detail on the coefficient estimates is available in Table 1, which reports average parameter estimates on the trade-cost variables. For the most part, the results align with previous literature (see Anderson and van Wincoop, 2004). While coefficients on distance and being in an FTA fluctuate mildly over the period, common language and adjacency show uneven downward trends. The coefficient on the tariff-FTA interaction increases markedly after 2000. Since 2000 is the dividing point between a period of global economic expansion and a period of global economic stagnation, the results may indicate that business cycles may affect substitution elasticities (or at least gravity model estimates of these elasticities).

Of primary interest is how Latin America's export-supply capacities compare to those of China and to import-demand conditions in the United States. Figures 2a-2d plot export coefficients for the four Latin American countries against the constant terms in the

[3] The current appendix gives results for 40 of the 90 industries in the sample. We will expand the coverage of the appendix in later versions of the paper.

regressions, which represent mean sectoral trade values for the United States. Observations are weighted by each country's sectoral shares of annual manufacturing exports. The figures show a negative relation for all countries except Chile (-0.11 for Argentina, -0.64 for Brazil, 0.27 for Chile, and -0.28 for Mexico, all of which are statistically significant), suggesting that most Latin American countries tend to have stronger exports in sectors in which the United States has *lower* levels of trade. Figures 3a-3d plot annual changes in Latin America's export coefficients against annual changes in the constant terms, which are changes in mean U.S. sectoral trade. Again, for each country except Chile, there is a negative correlation between the two sets of coefficients (-0.29 for Argentina, -0.43 for Brazil, 0.11 for Chile, and -0.69 for Mexico, all statistically significant). Sectors in which Latin America shows most improvement in export-supply capacity tend to be those in which the United States shows weaker increases in trade.

Figures 4a-4d plot exporter coefficients for the four countries against China over the sample period (again using each country's sectoral shares of annual manufacturing exports as weights). For all countries, there is a positive correlation between the two sets of exporter coefficients (0.34 for Argentina, 0.35 for Brazil, 0.49 for Chile, and 0.32 for Mexico, all statistically significant). Sectors in which Latin America has a relatively strong export-supply capacity tend to be those in which China's export capacity is also strong. Since exporter coefficients are expressed as deviations from U.S. sectoral means, the positive correlation between exporter coefficients for Latin America and China is not simply a statistical artifact of the data (as would be the case, for instance, if we were comparing mean sectoral exports in Latin America and China). Figures 4a-4d show that, conditional on sectoral trade values for the United States, China tends to have higher exports in Latin America's larger manufacturing export industries.

Figures 5a-5d plot annual changes in export coefficients for Latin America against those for China (weighted by each country's annual industry export shares). For all countries except Chile, the correlation is positive (0.51 for Argentina, 0.22 for Brazil, -0.04 for Chile, and 0.74 for Mexico, all except Chile are statistically significant). This suggests that industries in which China's export supply capacities are strengthening also tend to be those in which Latin America's export capacities are strengthening. Since the plotted values are changes in deviations from U.S. industry means (and not changes in the means themselves), the correlations are not an artifact of the data.

To compare the export capabilities of Latin America and China for individual sectors, Figures 6a-6d plot export coefficients in China against the 16 largest manufacturing export sectors in each Latin American country (which over the sample period account for 85% of Argentina's manufacturing exports, 70% of Brazil's manufacturing exports, 90% of Chile's manufacturing exports, and 75% of Mexico's manufacturing exports). Note first that the identities of the industries vary considerably across countries, indicating that there is variation across Latin American countries in the sectors in which national exports are concentrated. This fact makes the positive correlations between China and Latin America's export supply capacities in Figures 4 and 5 all the more remarkable. Despite the diversity of industries represented, China tends to be strong in many or most of the larger export industries accounted for by Argentina, Brazil, and Mexico. For Argentina, China's export supply capacities show relative improvement in 7 of the 14 industries for which we have estimates for China.[4] For Brazil, China's export supply capacities show relative improvement in 10 of the 15 industries for which we have estimates for China. For Chile, China's export supply capacities show relative improvement in 5 of the 13 industries for which we have estimates for China. And for Mexico, China's export supply capacities show relative improvement in 12 of the 16 industries. The evidence in Figure 6 suggests that among the four countries Chile is least exposed and Mexico is most exposed to export supply shocks from China. Results we report next will be consistent with this finding.

3.2 Decomposing Manufacturing Export Growth

Our next exercise involves the decomposition of export growth for the four Latin American countries into changes in export-supply capacities, changes in import-demand conditions, and changes in other components, as proposed in equation (9). Table 3 reports the total change in manufacturing exports for Argentina, Brazil, Chile, and Mexico over two time periods, 1995-2000 and 2000-2004. The reported change in trade is the total change in trade values (divided by the number of years in the subperiod), normalized by the average of trade values in the beginning and end period. Thus, for instance, Table 3 shows that manufacturing exports in Mexico grew by an annual average of 16.5% over 1995-2000 and 2.4% over 2000-2004.

The results in Table 3 are for a restricted set of industries. When we include the full sample of manufacturing industries, we tend to obtain implausibly large values for individual decomposition terms in food products, mineral processing, or other industries

[4] Sectors in which we do not have estimates of export supply capacities for China are those in which China does not export to at least one country in all years covered in the sample (1995-2004).

associated with the processing of primary commodities for Brazil and Chile (but not for Argentina or Mexico). As a crude way to address this problem, we limit the results we report in this paper to those for HS two-digit industries 80 to 99, which consists of metal products, machinery, electronics, transportation equipment, and industrial equipment, none of which are intensive in natural resources or primary commodities.[5] Even with this sample restriction, the decomposition terms for Brazil are too large to be credible.

The first column of Table 3 shows that in all countries manufacturing export growth was slower after 2000 than before, with Argentina exhibiting the largest decline (during a period that follows the country's abandonment of its currency board and ensuing economic turmoil) and Mexico showing the next largest decline.

Two other patterns in Table 3 are worthy of note. One is that in column (2) for all countries the contribution of the exporter coefficients to export growth is larger before 2000 than after. This suggests that in Latin America a slow down in the growth of manufacturing export supply capacity contributed to the slow down in manufacturing export growth. While the decomposition does not isolate the source of the slowing in Latin America's export supply capacity, one obvious source would be constraints on manufacturing growth. These constraints are likely to vary by country. In Brazil and Chile, which have enjoyed export-driven booms in commodity production, constraints on manufacturing growth may come from other sectors of the economy enjoying relative price increases and as a result expanding more rapidly, absorbing resources that would have otherwise gone into manufacturing. In Mexico, which has not enjoyed a similar

[5] The four-digit industries in HS two-digit industries 80 to 99 are tin and articles thereof, base metals and articles thereof, tools, miscellaneous articles of base metal, boilers and machinery, electrical and electronic equipment, railway equipment, motor vehicles, aircraft, ships, optical equipment, clocks and watches, musical instruments, arms and ammunition, furniture, toys and games, miscellaneous manufactured articles, works of art, and other commodities.

commodity boom, domestic factors may be the primary obstacle to growth. These may include relatively high energy prices, poor telecommunications infrastructure, and slow growth in the supply of skilled labor, among other possible factors.

A second notable pattern in Table 3 is that mean US sectoral trade contributes much less to export growth in Latin America after 2000 than before. There are several possible explanations for this. One is that the slowing of the US. economy after 2000 resulted in slower growth in U.S. demand for imports, thereby contributing to slower export growth in Latin America. If the sluggishness of the U.S. economy is the primary source of the slowing in U.S. demand for Latin America's exports, this shock is likely to be temporary. As the U.S. economy continues to recuperate, demand for Latin America's exports would likely grow. A second possibility is that China's continued export expansion has lowered relative prices for manufacturing goods and displaced exports from other countries, including those from Latin America, in the U.S. market. A China-related negative demand shock for Latin American manufacturing exports would be of greater concern than a negative demand shock associated with slow growth in the U.S. economy, for China's export strength in manufacturing is likely to persist. In the next section, we explore these two options in more detail.

3.3 Counterfactual Decompositions

The results in Table 3 provide a summary of how Latin American exports have grown but they do not reveal why they have grown. To explore this issue, we apply insights derived from equation (10). In Table 4, we explore how Latin America's export growth might have differed had the U.S. economy not slowed down after 2000. We impose the assumption that U.S. GDP growth over 2000 to 2004 (2.6%) was the same as that over 1995 to 2000 (3.2%). Returning to (9), we perform the following counterfactual calculation:

$$X_{njkt} = e^{\tilde{\theta}_{nt}} e^{\tilde{s}_{njt}} e^{\tilde{m}_{nkt} + \pi_{nkt}} e^{\tilde{\varepsilon}_{njkt}} d_{jk}^{\tilde{\beta}_{nt}} \equiv \Theta_{nt} S_{njt} \hat{M}_{nkt} E_{njkt} D_{njkt}, \quad (11)$$

in which we set π_{nkt} equal to 0.024 (4*0.006) if k equals the United States and t equals 2004, and zero otherwise. This has the effect of inflating the import-demand coefficient for the United States in 2004 to what it would have been had the U.S. economy grown by the same rate after 2000 as it had before (and no other changes occurred in the global economy). We then use (11) to estimate counterfactual export growth in the four Latin American countries over 2000-2004, in which we replace ΔM_{nkt} with $\Delta\hat{M}_{nkt}$.

It is important to recognize that the counterfactual estimation of Latin American export growth in Table 4 is not a general-equilibrium exercise. Since the United States is a large country, stronger U.S. economic growth (due, say, to higher levels of Hicks neutral technological change) would have likely affected the global demand for goods and therefore global factor demands, generating changes in factor prices in U.S. trading partners, including Latin America. In the counterfactual calculations we report, we assume away such feedback effects from import demand into factor prices. Since higher demand for Latin American exports would have likely increased production costs in the country and the relative price of Latin American exports, the counterfactual export growth we report likely overstates what would have occurred in actuality

The results in Table 4 suggest that had U.S. GDP growth not decelerated after 2000, over 2000-2004 Argentine exports would have grown by 0.2% more, Brazilian exports would have grown by 0.8% more, Chilean exports would have grown by 0.7% more, and Mexican exports would have grown by 1.4% more. In performing this exercise, we impose the unitary coefficients on the variables on the right of equation (10). The results suggest that had the U.S. economy not slowed down in the early 2000s, only in Mexico would export growth been more than nominally higher than it was. That the U.S. slow down matters more for Mexico is not surprising. The United States is a much larger trading partner for Mexico than for the countries of South America. What perhaps is surprising is that changes in U.S. GDP appear to matter so little for Latin American exports overall.

To evaluate the impact of China's export growth on Latin America, we again utilize (10). We impose the assumption that China's export coefficients remain unchanged from 1995 forwards. Following (10), this would have the effect of raising the import-price index in importing countries, leading to an overall increase in their importer coefficient. For country k, we redefine the change in importer coefficient in (11) to be,

$$\pi_{nkt} = \ln\left(\sum_{h \neq c} e^{\tilde{s}_{nht}} d_{hk}^{\tilde{\beta}_{nt}} + e^{\tilde{s}_{nc0}} d_{hk}^{\tilde{\beta}_{nt}} \right) - \ln\left(\sum_{h \neq c} e^{\tilde{s}_{nht}} d_{hk}^{\tilde{\beta}_{nt}} + e^{\tilde{s}_{nct}} d_{hk}^{\tilde{\beta}_{nt}} \right), \qquad (12)$$

where h=c indicates China and $\tilde{s}_{nc0}$ indicates China's exporter coefficient in sector n in the initial period. Thus, (12) shows how the importer coefficient for country k would have differed in year t had China's exporter coefficients remain unchanged from the initial year. Again, it is important to recognize that this is not a general-equilibrium exercise.

The results in Table 4 suggest that had China's export-supply capacity not changed over the sample period, Argentina's annual average export growth would have been 0.4 percentage points higher over 1995-2000 and 1.1 percentage points higher over 2000-2004, Brazil's annual average export growth would have been 0.7 percentage points higher over 1995-2000 and 1.4 percentage points higher over 2000-2004, Chile's annual average export growth would have been 0.8 percentage points higher over 1995-2000 and 2.3 percentage points higher over 2000-2004, and Mexico's annual average export growth would have been 1.2 percentage points higher over 1995-2000 and 3.1 percentage points higher over 2000-2004. Naturally, the effects are larger in the latter time period, as the impact of holding China's export supply capacities constant cumulates over time. Consistent with Figures 4-6, of the four countries Mexico appears to be the most exposed to export competition from China. This owes to the fact that China's strong export industries overlap more with Mexico than with the other countries of Latin America.

Interestingly, the impact on Latin American exports of China's export-capacity growth is two to five times as large as the impact of the U.S. economic slowdown. While it may be reasonable to view sluggish U.S. growth as a temporary shock, the same does not hold for China's export growth. Thus, only a small part of the recent slow down in Latin American export growth appears associated with transitory business cycle factors.

Comparing the results in Tables 3 and 4, the estimated impact of China's growth on Latin America is small relative to the impact of changes in the countries' export-supply capacities, distance coefficients, or residual factors. While China's performance clearly seems to affect Latin America, other factors matter more.

4. Discussion

In this paper, we use the gravity model of trade to decompose Latin America's export growth into components associated with export-supply capacity, import-demand conditions, and other factors. We apply the framework to Argentina, Brazil, Chile, and Mexico. There are three main findings. First, since the mid 1990s export-supply capacities in Mexico, but not the other countries, have improved relative to the rest of the world. Commodity booms in Brazil and Chile and economic crisis in Argentina may account for the apparent decrease in the countries' manufacturing export supply capabilities. Second, Argentina, Brazil, and Mexico are relatively exposed to export-supply shocks from China, with Mexico being the most exposed. Industries in which Mexico has strong export capabilities are also those in which China's capabilities are strong, and in most industries China's capabilities improve over time relative to Mexico. Had China's export-supply capacities remained constant from 1994 onward, Latin America's annual export growth rate would have been up to 0.4 to 1.4 percentage point higher during the late 1990s and 1.1 to 3.1 percentage points higher during the early 2000s. Third, while changes in Latin America's export-supply capacities have contributed positively to the country's export growth, changes in U.S. import demand in Latin America's key export industries have not. Latin America's exports are concentrated in sectors in which the United States has shown relatively weak growth in trade. Had U.S. GDP grown at the same rate from 2000 to 2004 as it had in the late 1990s, Latin America's annual export growth rate would have been up to 0.2 to 1.4 percentage points higher.

There are several important caveats to our results. Our framework and analysis are confined to manufacturing industries and the decomposition of export growth is confined to a subset of manufacturing industries (mainly industrial machinery, electronics, and transportation equipment). There may be important consequences of China or U.S. business cycles for Latin America's commodity trade, which we do not capture. The counterfactual decompositions of export growth that we report do not account for general-equilibrium effects. There could be feedbacks from a slowdown in China's export growth or an increase in U.S. GDP growth that would cause us to overstate the growth consequences of such shocks for Latin America. There are also concerns about the consistency of the coefficient estimates, due to the fact that we do not account for why there is zero trade between some countries.

The results have a number of important lessons for policy makers. Of the four countries, Mexico appears to be most exposed to import-demand shocks associated with U.S. aggregate demand and competition from China. Given that patterns of industrial specialization tend to change slowly over time, Mexico's exposure to China is unlikely to change in the short to medium run. Yet, while negative, the effects of China's growth on Latin America's manufacturing exports are not as large as many appear to believe. Domestic constraints on manufacturing appear to be a more important factor limiting export growth in all four of the countries examined.

References

Anderson, James E. and Van Wincoop, Eric. "Gravity with Gravitas: A Solution to the Border Puzzle." *American Economic Review*, March 2003.

Anderson, James E. and Van Wincoop, Eric. "Trade Costs." *Journal of Economic Literature*, September 2004.

Devlin, Robert, Antoni Estevadeordal, and Andres Rodriguez. 2005. *The Emergence of China: Opportunities and Challenges for Latin America and the Caribbean.* Washington, DC: Inter-American Development Bank.

Eichengreen, Barry, and Hui Tong. 2005. "Is China's FDI Coming at the Expense of Other Countries?" NBER Working Paper No. 11335.

Feenstra, Robert C. *Advanced International Trade: Theory and Evidence*. Princeton: Princeton University Press, 2003.

Feenstra, Robert C.; Lipsey, Robert and Bowen, Charles. "World Trade Flows, 1970-1992, with Production and Tariff Data." National Bureau of Economic Research (Cambridge, MA) Working Paper No. 5910, January 1997.

Feenstra, Robert C., Robert Lipsey, Haiyan Deng, Alyson C. Ma, and Hengyong Mo. 2005. "World Trade Flows: 1962-2000." NBER Working Paper No. 11040.

Fujita, Masahisa, Paul Krugman, and Anthony Venables. 1999. *The Spatial Economy: Cities, Regions, and International Trade*. Cambridge, MA: MIT Press.

Hanson, Gordon, and Chong Xiang. "The Home Market Effect and Bilateral Trade Patterns," *American Economic Review*, September 2004, 94: 1108-1129.

Hanson, Gordon, and Raymond Robertson. "A Gravity Framework for Decomposing Demand and Supply Shocks to Trade." Mimeo, UCSD and Macalaster College.

Harrigan, James. 1995. "Factor Endowments and the International Location of Production: Econometric Evidence For the OECD, 1970-1985." *Journal of International Economics* 39: 123-141.

Harrigan, James. 1997. "Technology, Factor Supplies, and International Specialization: Estimating the Neoclassical Model." *American Economic Review* 87: 475-494.

Head, Keith and Ries, John. "Increasing Returns versus National Product Differentiation as an Explanation for the Pattern of US-Canada Trade." *American Economic Review*, September 2001, 91(4), pp. 858-76.

Head, Keith, and Mayer, Theiry. “The Empirics of Agglomeration and Trade.” In J. Vernon Henderson and Jacque Thisse, eds., *Handbook of Regional and Urban Economics*, Amsterdam: North Holland, 2004.

Helpman, Elhanan, Marc J. Melitz, and Yona Rubinstein. 2004. “Trading Partners and Trading Volumes,” mimeo, Harvard University.

Hummels, David. “Towards a Geography of Trade Costs.” Mimeo, University of Chicago, 1999.

Hummels, David, and Peter Klenow. 2005. “The Variety and Quality of a Nation’s Exports.” *American Economic Review*, 95: 704-723.

Leamer, Edward E. *Sources of International Comparative Advantage: Theory and Evidence*. Cambridge, MA: MIT Press, 1984.

Lopez Cordoba, Ernesto, Alejandro Micco, and Danielken Molina. 2005. “Howe Sensitive Are Latin American Exports to Chinese Competition in the U.S. Market?” Mimeo, Inter-American Development Bank.

Redding, Stephen and Venables, Anthony J. “Geography and Export Performance: External Market Access and Internal Supply Capacity.” NBER Working Paper No. 9637, April 2003.

Redding, Stephen and Venables, Anthony J. “Economic Geography and Global Development.” *Journal of International Economics*, January 2004.

Santos Silva, J.M.C., and Silvana Tenreryo. 2005. “The Log of Gravity.” *The Review of Economics and Statistics*, forthcoming.

Schott, Peter. 2004. “Across Product versus within Product Specialization in International Trade.” *Quarterly Journal of Economics*, May 119(2): 647-678.

Wooldridge, Jeffrey M. 2002. *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: MIT Press.

Appendix A: Average Exporter Coefficients
(for countries that do not appear as importers)

Country	Exporter Coefficient	% Significant
Angola	0.776	62.50
United Arab Emirates	1.135	98.70
Bangladesh	0.900	70.17
Bulgaria	-3.292	99.40
Cote d'Ivoire	0.939	89.12
Cameroon	-0.009	60.00
Dominican Republic	-4.061	91.46
Gabon	-0.268	70.00
Honduras	-2.187	100.00
Iran, Islamic Rep.	0.935	87.26
Kuwait	0.884	83.28
Sri Lanka	-1.621	88.38
Nigeria	0.955	67.45
Pakistan	-1.363	87.49
Philippines	-2.544	97.75
Qatar	0.682	76.47
Saudi Arabia	1.599	85.67
Thailand	-2.481	84.52
Trinidad and Tobago	-2.842	96.40
Taiwan, China	-1.200	92.65

Appendix B: Average Country Importer and Exporter Coefficients
(for countries that appear as exporters and importers)

Country	Importer Coefficient	% Significant	Exporter Coefficient	% Significant
Argentina	-3.121	97.94	-2.466	98.60
Australia	-1.925	96.59	-2.380	98.22
Austria	-4.104	100.00	-3.935	100.00
Brazil	-2.173	98.67	-1.662	99.47
Canada	-2.148	99.06	-2.291	99.77
Switzerland	-3.924	99.81	-3.835	99.72
Chile	-3.222	98.19	-4.654	98.46
China	-1.440	93.59	0.367	83.13
Colombia	-3.949	99.88	0.211	98.84
Costa Rica	-5.670	100.00	-3.446	99.94
Czech Republic	-4.522	99.98	-3.767	99.12
Germany	-1.554	93.57	-0.196	68.49
Denmark	-4.165	100.00	-3.090	99.22
Algeria	-5.204	100.00	-0.790	75.00

Ecuador	-4.565	99.98	-0.536	89.43
Egypt, Arab Rep.	-4.871	100.00	-1.173	97.94
Spain	-2.886	99.38	-2.052	96.06
Finland	-4.024	100.00	-2.836	98.88
France	-2.306	99.52	-1.539	91.75
United Kingdom	-1.688	94.94	-1.679	96.64
Greece	-4.026	100.00	-3.368	97.11
Guatemala	-5.376	100.00	-1.883	99.63
Hong Kong, China	-1.829	94.40	-1.385	93.18
Hungary	-4.096	100.00	-3.835	98.22
Indonesia	-3.252	99.06	-0.835	78.45
India	-3.559	99.97	-1.906	90.43
Ireland	-3.674	100.00	-3.349	98.63
Iceland	-6.030	100.00	-8.117	100.00
Israel	-3.420	99.35	-3.679	100.00
Italy	-2.482	99.45	-1.220	83.48
Japan	-1.351	95.95	0.332	78.57
Korea, Rep.	-1.840	99.14	-1.135	82.87
Morocco	-4.878	100.00	-2.615	94.57
Mexico	-2.592	99.92	-2.129	95.85
Malaysia	-1.860	98.59	-1.599	91.67
Netherlands	-2.413	99.85	-3.027	97.12
Norway	-3.908	99.51	0.533	98.99
New Zealand	-3.012	99.02	-3.921	99.40
Oman	-4.489	100.00	0.628	79.77
Peru	-4.377	100.00	-1.022	99.59
Poland	-3.677	99.78	-2.933	98.41
Portugal	-4.197	99.84	-3.368	93.01
Romania	-4.885	100.00	-2.402	92.13
Singapore	-1.392	97.32	-1.679	93.96
El Salvador	-5.676	100.00	-1.877	95.65
Sweden	-3.366	100.00	-2.349	99.53
Tunisia	-6.049	100.00	-2.583	93.98
Turkey	-3.510	99.31	-1.092	91.70
Venezuela	-3.924	99.48	-0.254	86.11
South Africa	-2.897	99.52	-3.531	99.84

Appendix C: HS Industry Code Descriptions

4 Digit HS	Description
901	Coffee; Coffee Husks Etc; Substitutes With Coffee
2203	Beer Made From Malt
2709	Crude Oil From Petroleum And Bituminous Minerals
2710	Oil (Not Crude) From Petrol & Bitum Mineral Etc.
6109	T-Shirts, Singlets, Tank Tops Etc, Knit Or Crochet
6110	Sweaters, Pullovers, Vests Etc, Knit Or Crocheted
6203	Women's Or Girls' Overcoats Etc, Not Knit Or Croch
6204	Men's Or Boys' Suits, Ensembles Etc, Not Knit Etc
8407	Spark-Ignition Recip Or Rotary Int Comb Piston Eng
8409	Parts For Engines Of Heading 8407 Or 8408
8414	Air Or Vac Pumps, Compr & Fans; Hoods & Fans; Pts
8415	Air Conditioning Machines (Temp & Hum Change), Pts
8418	Refrigerators, Freezers Etc; Heat Pumps Nesoi, Pts
8471	Automatic Data Process Machines; Magn Reader Etc
8473	Parts Etc For Typewriters & Other Office Machines
8481	Taps, Cocks, Valves Etc For Pipes, Tanks Etc, Pts
8501	Electric Motors And Generators (No Sets)
8504	Elec Trans, Static Conv & Induct, Adp Pwr Supp, Pt
8512	Electric Light Etc Equip; Windsh Wipers Etc, Parts
8516	Elec Water, Space & Soil Heaters; Hair Etc Dry, Pt
8517	Electric Apparatus For Line Telephony Etc, Parts
8518	Microphones; Loudspeakers; Sound Amplifier Etc, Pt
8525	Trans Appar For Radiotele Etc; Tv Camera & Rec
8527	Reception Apparatus For Radiotelephony Etc
8528	Tv Recvrs, Incl Video Monitors & Projectors
8529	Parts For Television, Radio And Radar Apparatus
8536	Electrical Apparatus For Switching Etc, Nov 1000 V
8537	Boards, Panels Etc Elec Switch And N/C Appar Etc.
8541	Semiconductor Devices; Light-Emit Diodes Etc, Pts
8542	Electronic Integrated Circuits & Microassembl, Pts
8544	Insulated Wire, Cable Etc; Opt Sheath Fib Cables
8703	Motor Cars & Vehicles For Transporting Persons
8704	Motor Vehicles For Transport Of Goods
8708	Parts & Access For Motor Vehicles (Head 8701-8705)
9018	Medical, Surgical, Dental Or Vet Inst, No Elec, Pt
9029	Revolution & Production Count, Taximeters Etc, Pts
9032	Automatic Regulating Or Control Instruments; Parts
9401	Seats (Except Barber, Dental, Etc), And Parts
9403	Furniture Nesoi And Parts Thereof
9405	Lamps & Lighting Fittings & Parts Etc Nesoi

Table 1: Average Coefficient Estimates on Trade Cost Variables

Year	ln(Distance)	Common Language	Adjacency	FTA	FTA*ln(1+Tariff)
1995	-1.118	0.652	0.519	0.045	7.964
1996	-1.121	0.640	0.402	0.121	5.757
1997	-1.115	0.531	0.370	0.065	7.112
1998	-1.076	0.573	0.461	0.016	7.490
1999	-1.076	0.542	0.382	0.028	8.540
2000	-1.111	0.532	0.255	-0.074	11.396
2001	-1.086	0.493	0.239	0.001	16.854
2002	-1.049	0.545	0.348	0.165	20.709
2003	-1.063	0.479	0.299	0.184	22.771
2004	-1.118	0.497	0.207	0.128	13.804

Notes: Coefficient estimates are expressed as trade-value-weighted means for manufacturing industries.

Table 2a: Industry Shares of Manufacturing Exports for Mexico

HS Industry	HS Industry	Share of Mexican Manufacturing Exports
Internal combustion engine parts	8409	0.0106
Valves	8481	0.0115
Medical instruments	9018	0.0116
Automatic regulating equipment	9032	0.0139
Radio and TV parts	8529	0.0141
Women's and girl's dresses	6204	0.0147
Electric motors	8501	0.0156
Men's and boy's suits	6203	0.0183
Radio receivers	8527	0.0203
Telephone apparatus	8517	0.0205
Electric transformers	8504	0.0206
Electric switches	8536	0.0226
Internal combustion engines	8407	0.0236
Parts for office machines	8473	0.0248
Seats	9401	0.0278
Radios and TV transmitters	8525	0.0305
Motor vehicle parts	8708	0.0534
TV receivers	8528	0.0558
Motor vehicles for transporting goods	8704	0.0579
Insulated wire and cable	8544	0.0642
Computers	8471	0.0648
Motor vehicles for transporting people	8703	0.1463

Notes: This table shows the share of Mexican manufacturing exports for the industries that account for an average of 75% of Mexico's total exports over the sample period (1995-2004).

Tables 2b-2d for Argentina, Brazil, and Chile
(to be added)

Table 3: Decomposing Latin American Export Growth, 1995-2004

Period	Growth in Manufacturing Exports	Decomposition of Export Growth — Component of Growth Associated with Change in: Exporter Coefficients	Importer Coefficients	Mean US Trade	Trade-Cost Coefficients	Residual Factors
Argentina						
1995-2000	0.081	0.820	-1.249	0.247	0.692	-0.428
2000-2004	-0.045	0.098	-0.088	0.075	-0.072	-0.057
Brazil						
1995-2000	0.130	20.162	-0.111	50.305	-70.172	-0.054
2000-2004	0.111	1.787	-0.042	-4.587	2.924	0.029
Chile						
1995-2000	0.071	0.402	-0.007	-0.091	0.323	-0.556
2000-2004	0.053	0.146	-0.016	-0.099	0.005	0.017
Mexico						
1995-2000	0.165	0.475	-0.018	0.213	-0.184	-0.322
2000-2004	0.024	0.227	0.007	-0.189	0.154	-0.175

Notes: This table uses equation (9) to decompose annual average growth in a country's manufacturing exports into components associated with changes in sectoral importer coefficients in a country's trading partners, changes in a country's sectoral exporter coefficients, changes in mean U.S. sectoral trade, changes in trade costs (log distance, common language, adjacency, FTAs, tariffs), and changes in residual factors. These preliminary results are limited to four-digit industries in HS two-digit industries 80 to 99 (tin and articles thereof, base metals and articles thereof, tools, miscellaneous articles of base metal, boilers and machinery, electrical and electronic equipment, railway equipment, motor vehicles, aircraft, ships, optical equipment, clocks and watches, musical instruments, arms and ammunition, furniture, toys and games, miscellaneous manufactured articles, works of art, other commodities).

Table 4: Counterfactual Decompositions of Latin American Export Growth

Period	Actual Growth in Manufacturing Exports	Counterfactual Growth in Manufacturing Exports: Exporter Coefficients in China Constant over Time	Counterfactual Growth in Manufacturing Exports: US GDP Growth 2000-2004 =1995-2000
Argentina			
1995-2000	0.081	0.085	--
2000-2004	-0.045	-0.034	-0.043
Brazil			
1995-2000	0.130	0.137	--
2000-2004	0.111	0.125	0.119
Chile			
1995-2000	0.071	0.079	--
2000-2004	0.053	0.076	0.060
Mexico			
1995-2000	0.165	0.177	--
2000-2004	0.024	0.055	0.038

Notes: This table reports actual and counterfactual export growth in Latin American countries based on two scenarios: U.S. GDP growth over 2000-2004 equals that for 1995-2000, and China's export-supply capacity remains constant over the sample period (1995 to 2004) at levels equal to 1995 values.

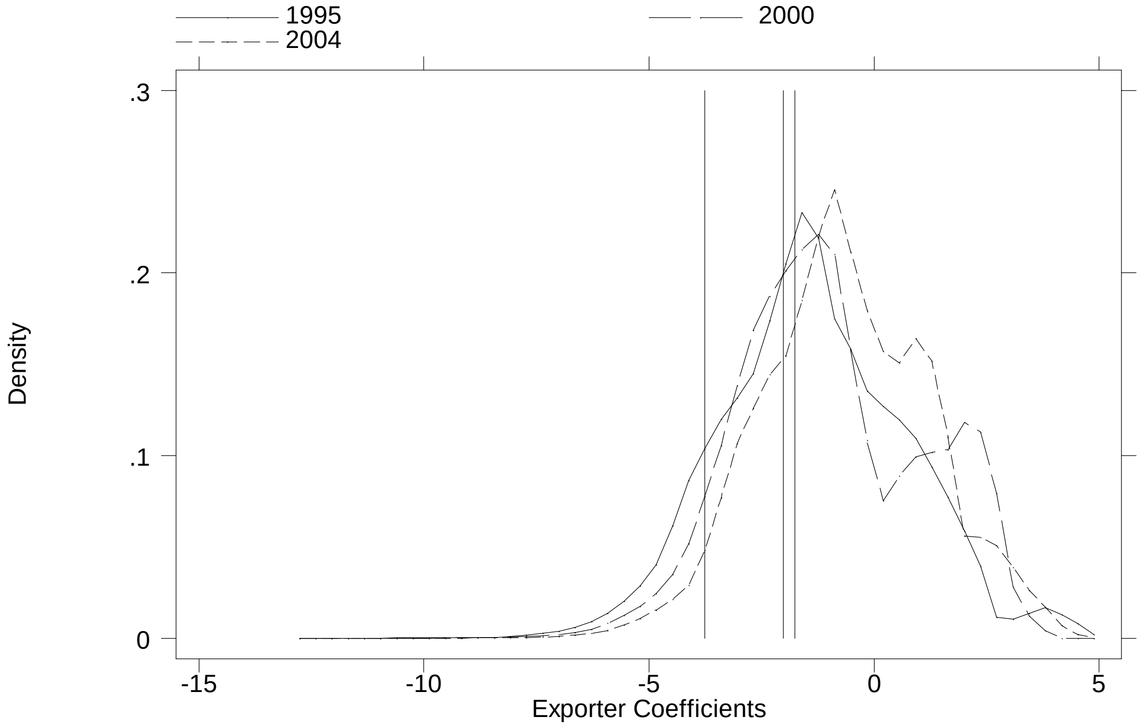

Figure 1a: Estimated Sector-Country Exporter Coefficients, Selected Years

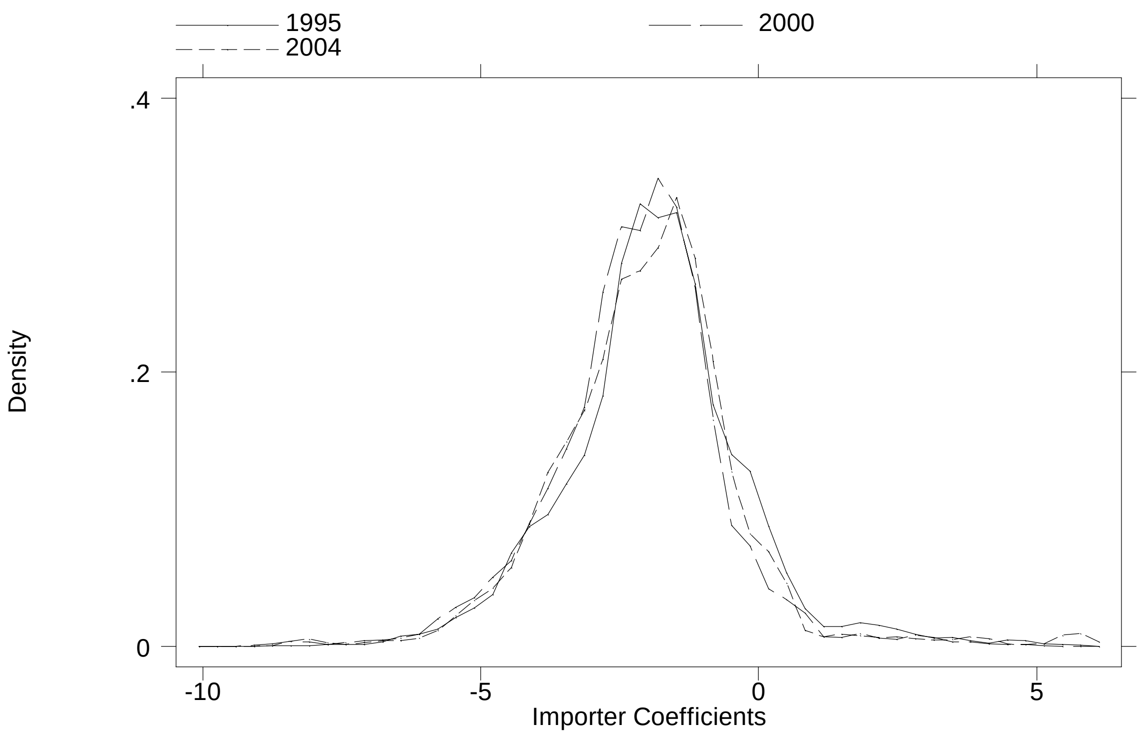

Figure 1b: Estimated Sector-Country Importer Coefficients, Selected Years

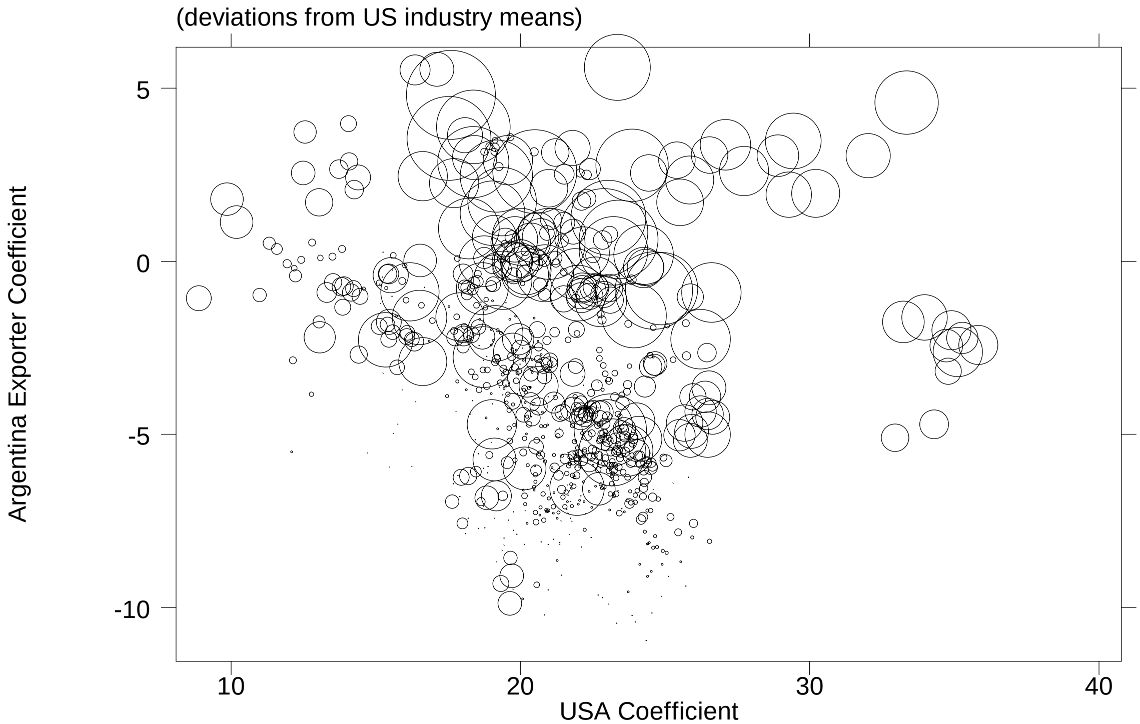

Figure 2a: Sectoral Export Coefficients for Argentina and US Sectoral Trade

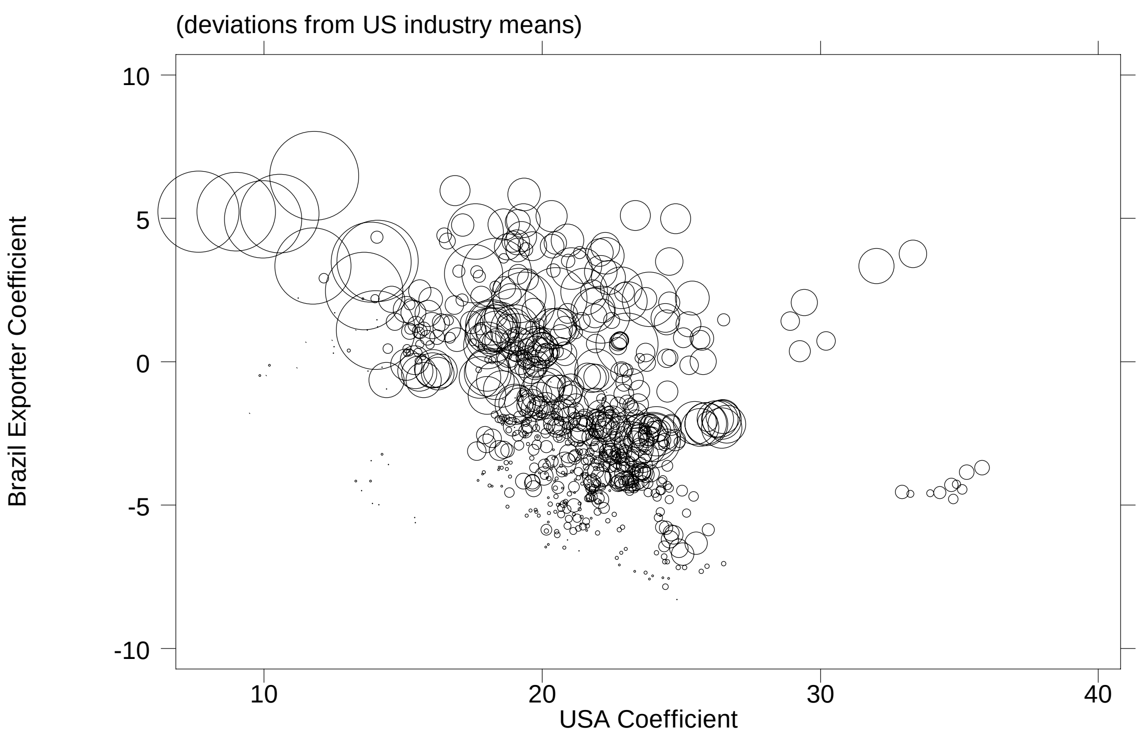

Figure 2b: Sectoral Export Coefficients for Brazil and US Sectoral Trade

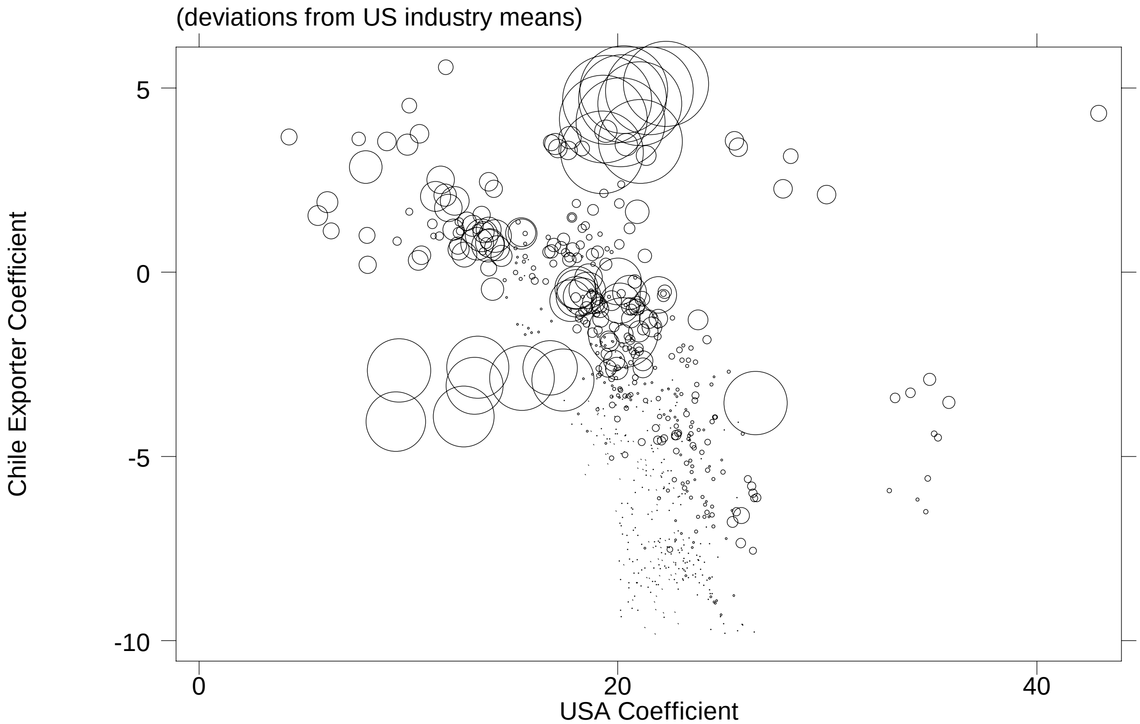

Figure 2c: Sectoral Export Coefficients for Chile and US Sectoral Trade

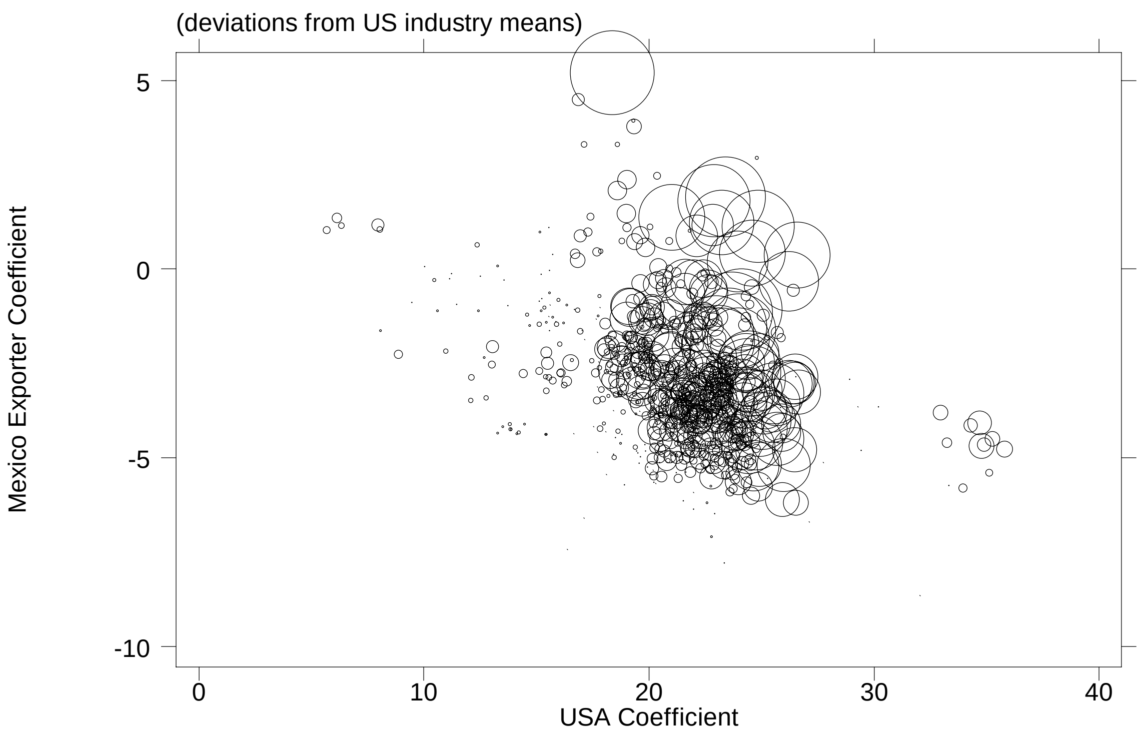

Figure 2d: Sectoral Export Coefficients for Mexico and US Sectoral Trade

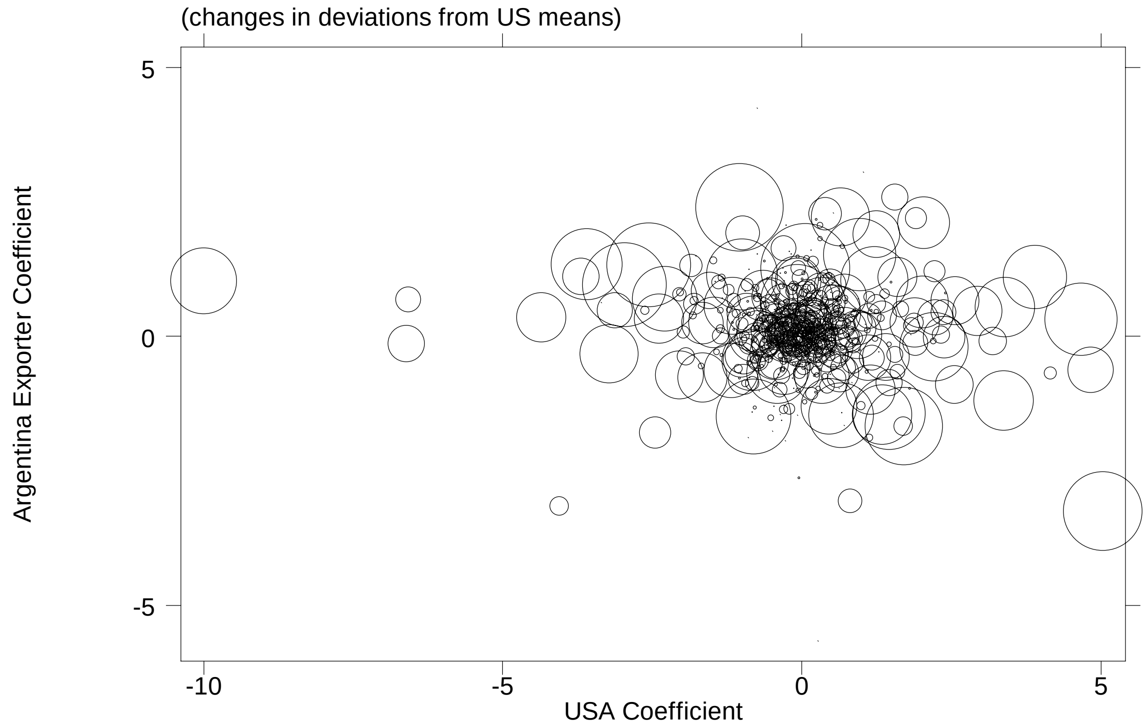

Figure 3a: Changes in Argentina's Export Coefficients and Changes in US Trade

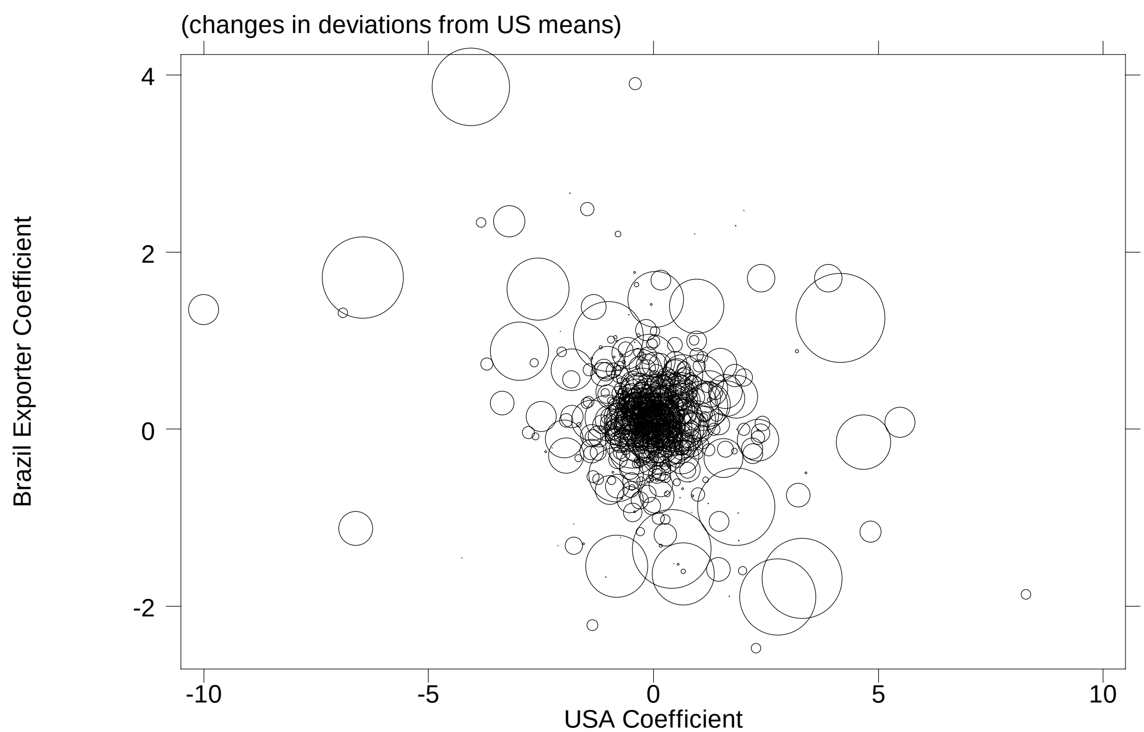

Figure 3b: Changes in Brazil's Export Coefficients and Changes in US Trade

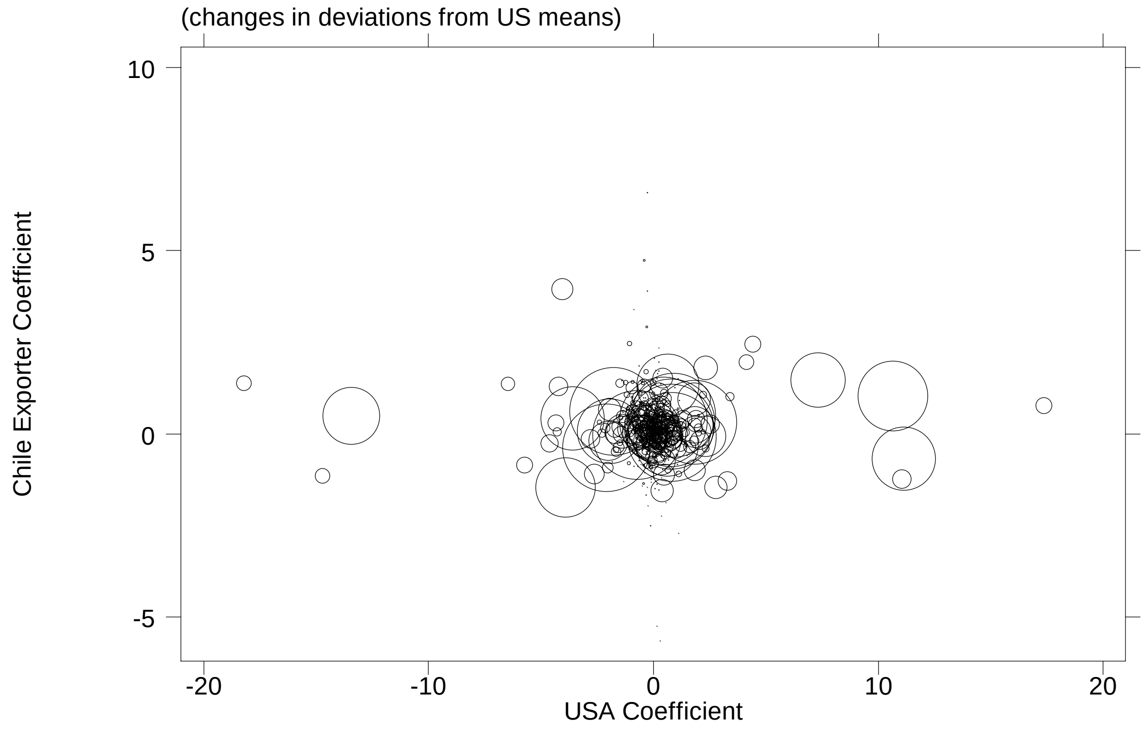

Figure 3c: Changes in Chile's Export Coefficients and Changes in US Trade

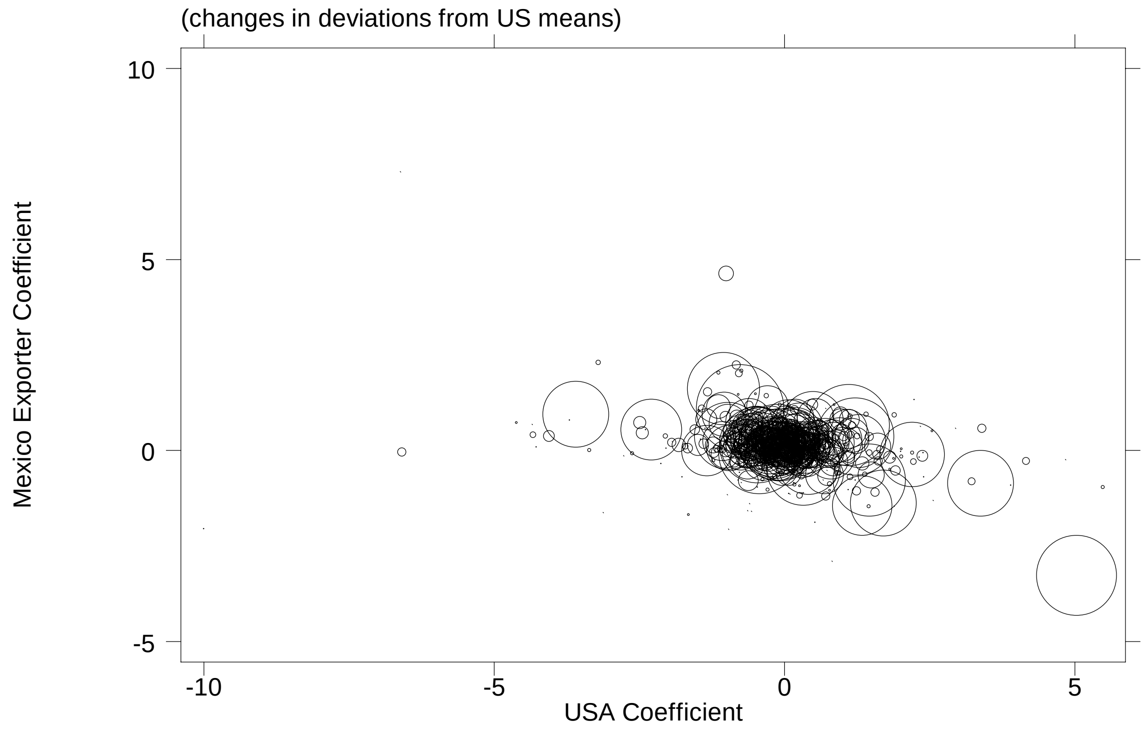

Figure 3d: Changes in Mexico's Export Coefficients and Changes in US Trade

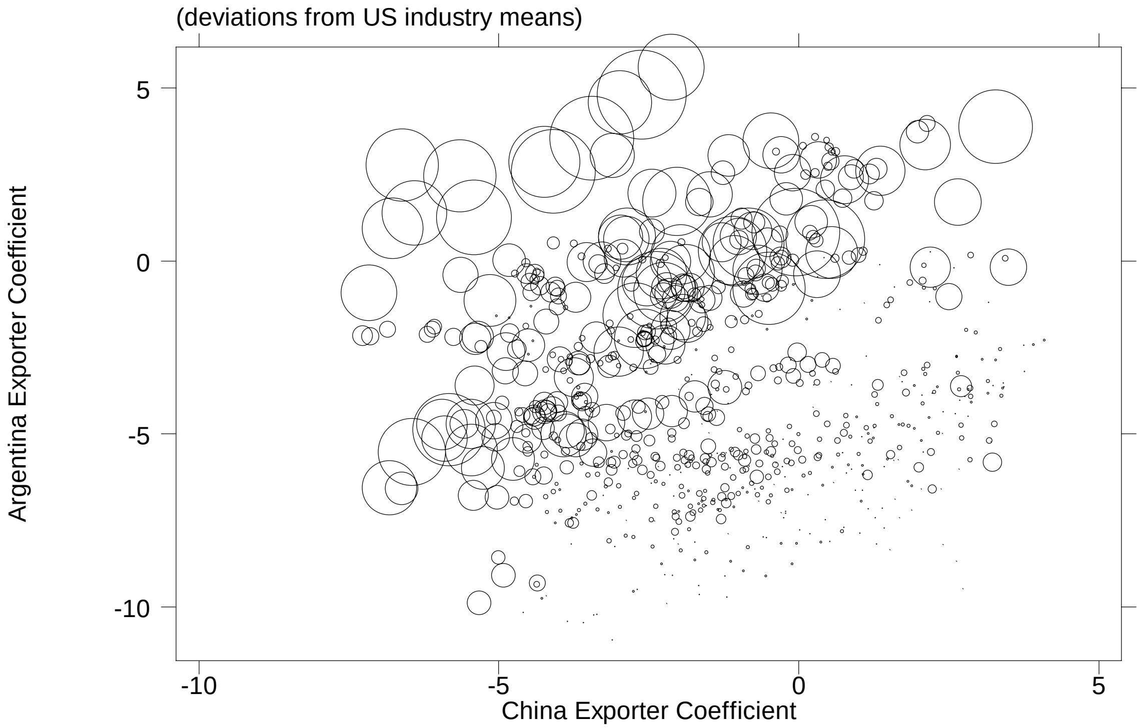

Figure 4a: Sectoral Export Coefficients, China and Argentina

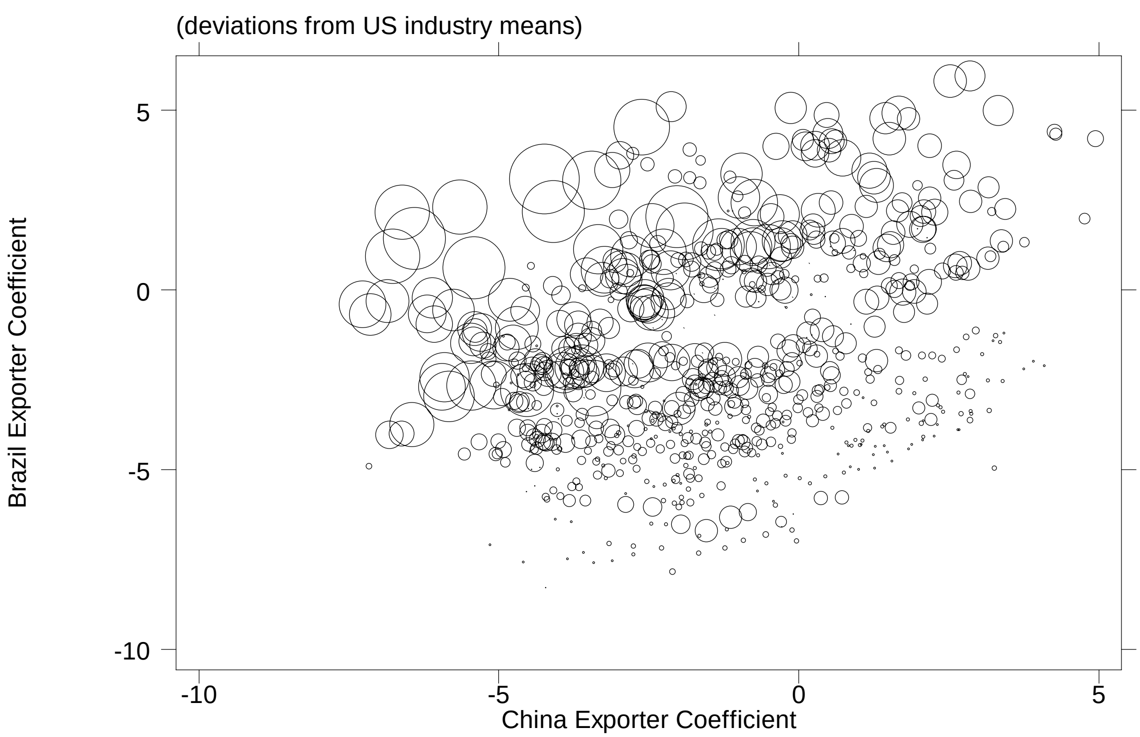

Figure 4b: Sectoral Export Coefficients, China and Brazil

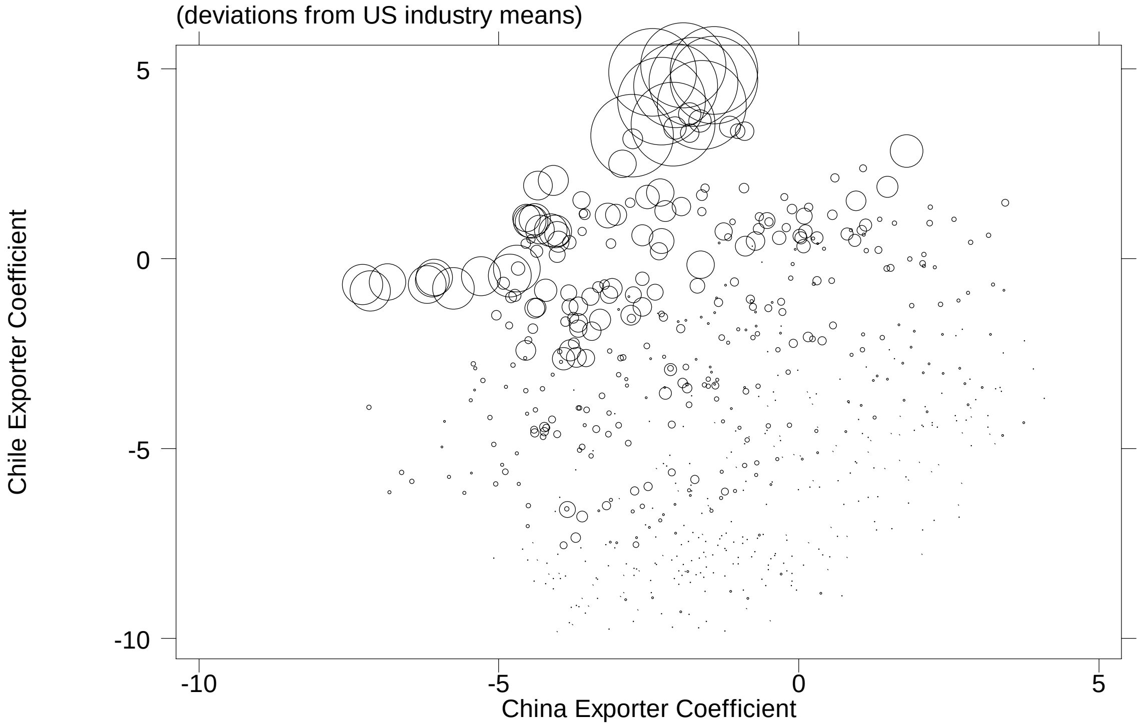

Figure 4c: Sectoral Export Coefficients, China and Chile

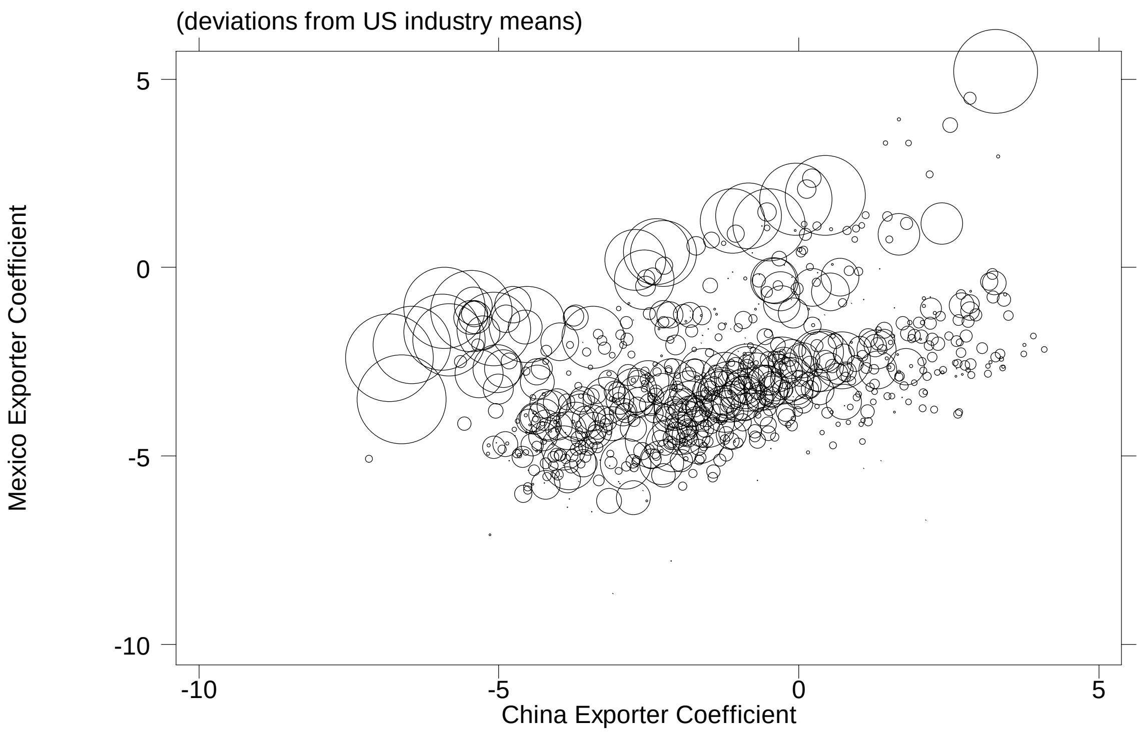

Figure 4d: Sectoral Export Coefficients, China and Mexico

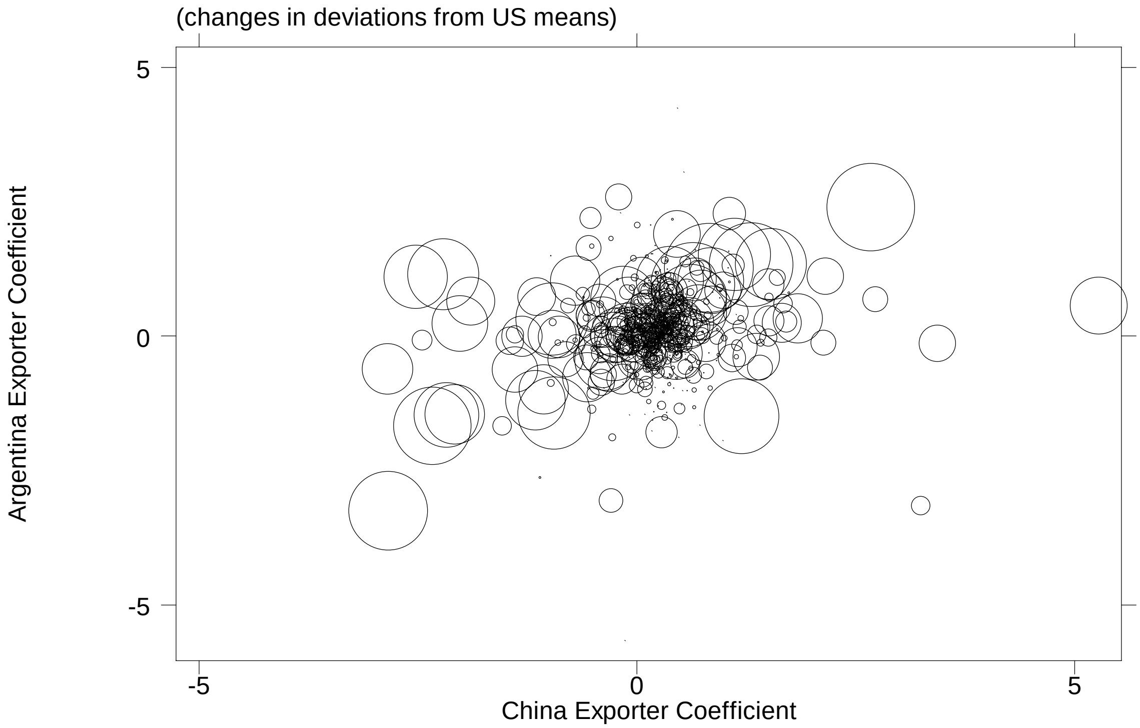

Figure 5a: Annual Changes in Sectoral Export Coefficients, China and Argentina

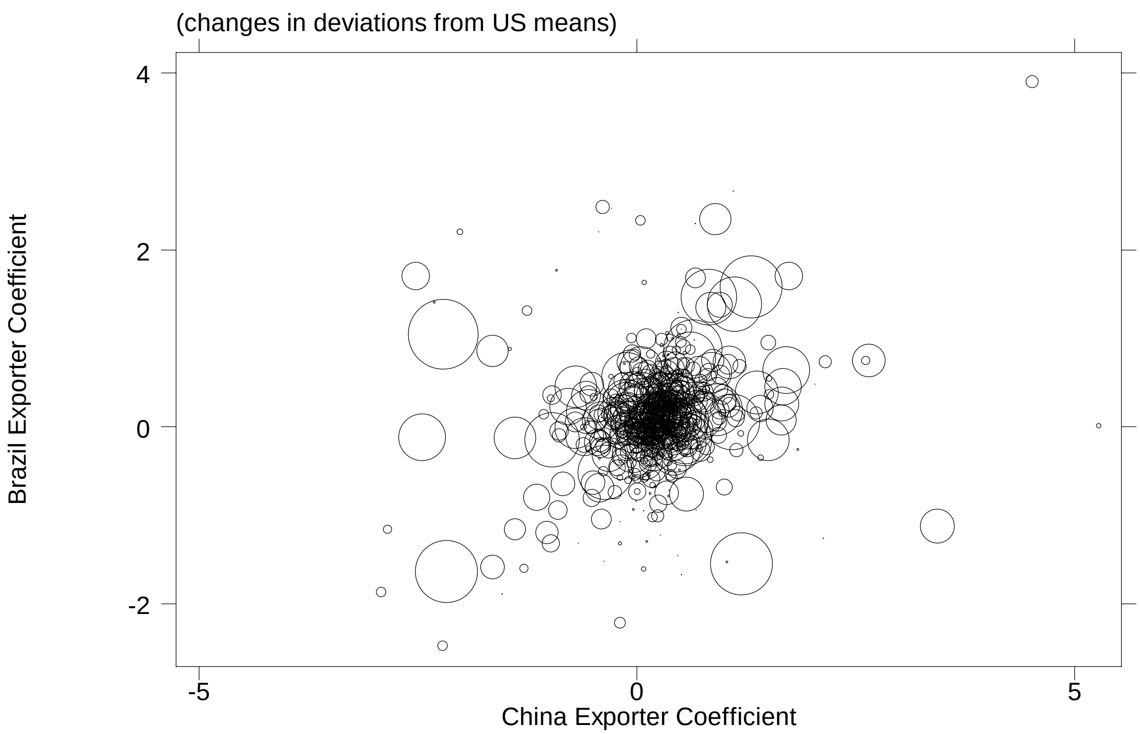

Figure 5b: Annual Changes in Sectoral Export Coefficients, China and Brazil

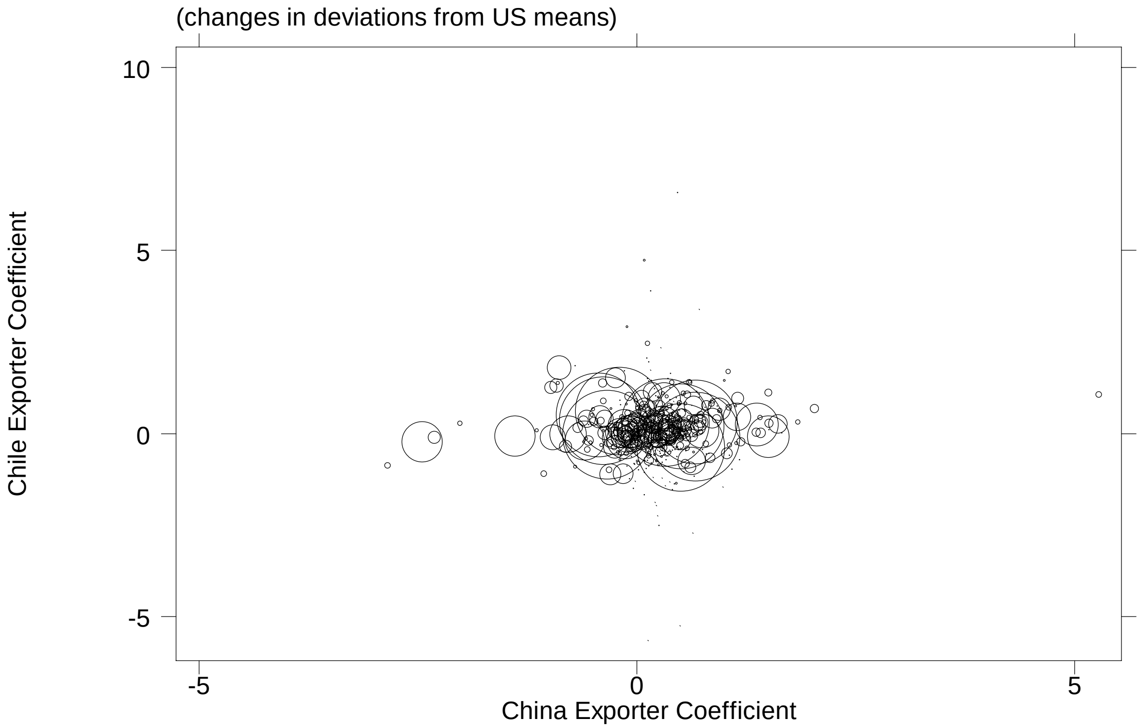

Figure 5c: Annual Changes in Sectoral Export Coefficients, China and Chile

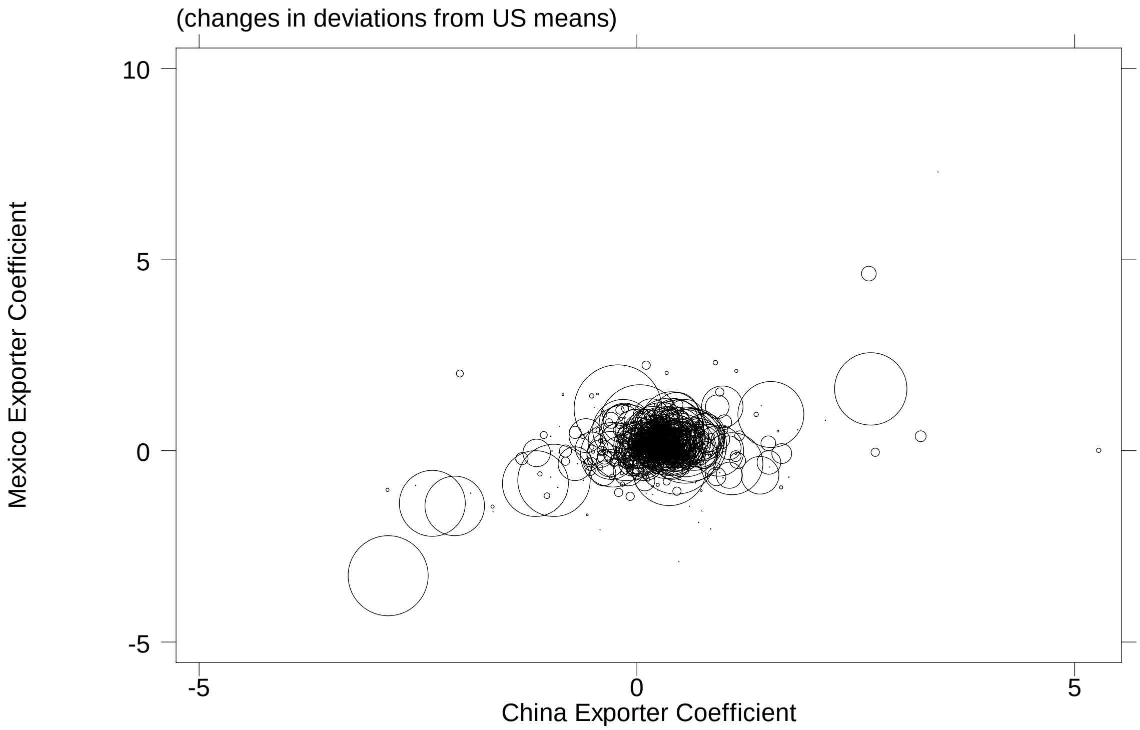

Figure 5d: Annual Changes in Sectoral Export Coefficients, China and Mexico

Figure 6a: Exporter Coefficients in Argentina and China by Sector

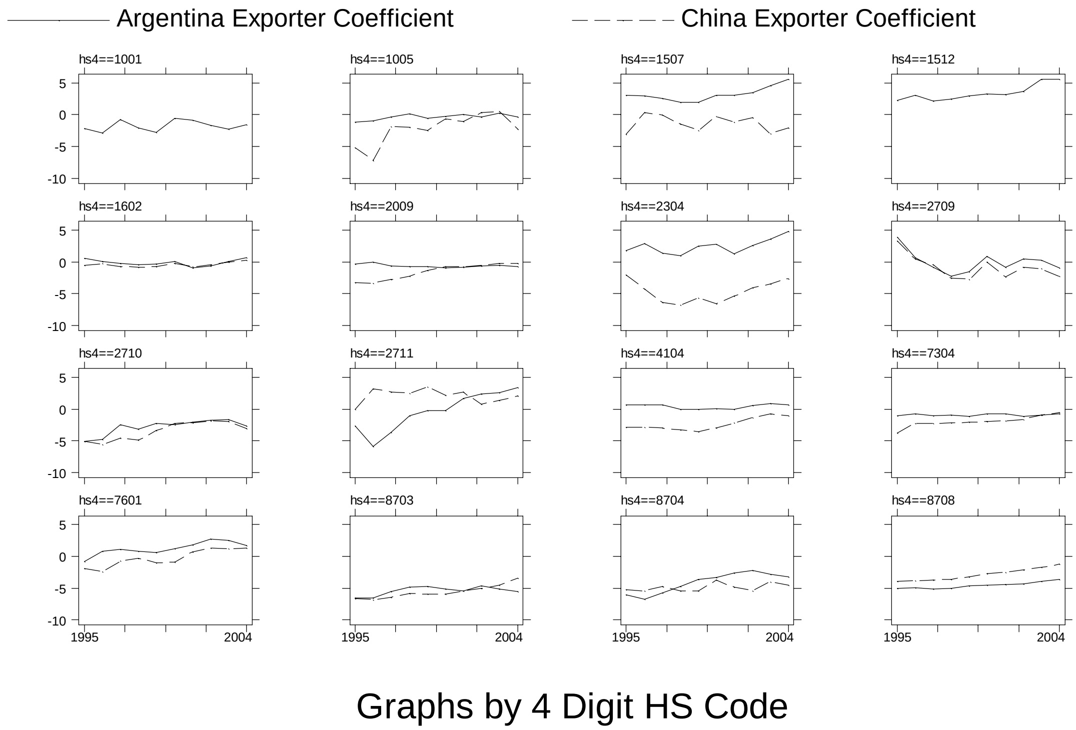

Figure 6b: Exporter Coefficients in Brazil and China by Sector

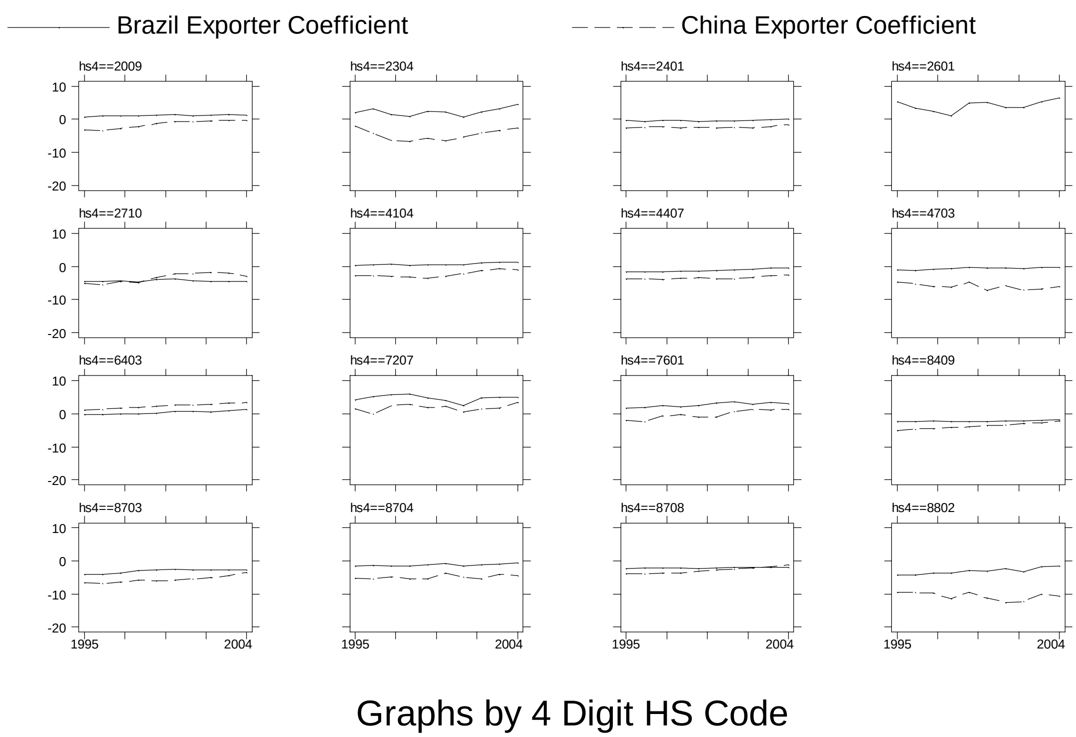

Figure 6c: Exporter Coefficients in Chile and China by Sector

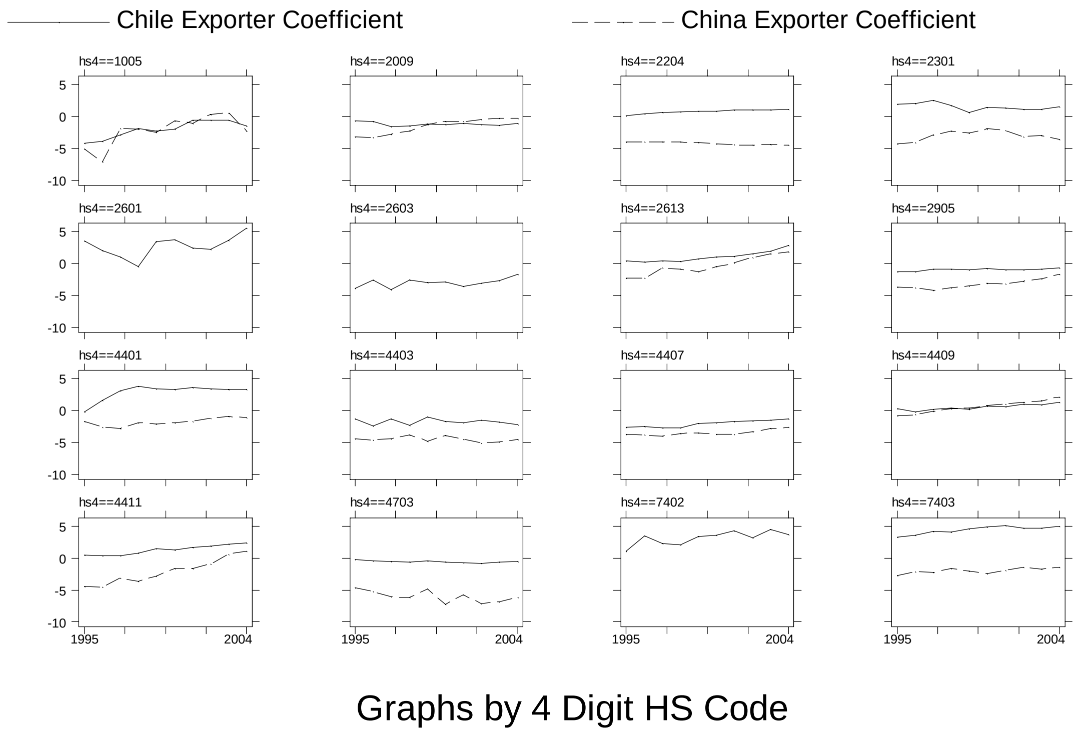

Figure 6d: Exporter Coefficients in Mexico and China by Sector