Geography, Policy, or Productivity? Regional Trade in five South American Countries, 1910-1950*

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Abstract: Regional trade in South America since independence has long been much smaller than would be expected if geography were the only constraint on trade. Several potential explanations exist: low technological and demand complementarities; low productivity; high barriers to trade. We first argue that none of these are mutually exclusive and different explanations may be valid at different times. Whatever the causes of low trade, such limits to market access likely hampered economic growth in the region. To address this issue, policy makers have long advocated a South American/Southern Cone Free Trade Area--proposed as early as 1889. Would reductions in trade costs have been sufficient to significantly raise trade? We study bilateral trade between 1910 and 1950, when large external shocks altered global supply and demand. These shocks help us identify the determinants of low intra-regional trade. We find evidence that both low productivity and high trade barriers decreased trade. South American regional trade might have expanded with less restrictive trade policy *or* improved productivity. Regional trade in textiles, which took off from the 1930s, supports our argument that trade improved when relative productivity and quality improved and when trade costs fell.

Key words: Trade integration, Trade Costs, Gravity Model, South American regional trade; ISI

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1. Introduction

Regional trade in South America since independence has long been much smaller than would be expected if geography were the only constraint on trade. Several potential explanations exist. The first suggests that factor endowments were sufficiently similar and goods so homogenous that foreign competition would easily be driven out of domestic markets due to the direct costs associated with importation. A Ricardian view would hold that the international division of labor was driven by comparative advantage. Western Europe and the USA specialized in manufactures while South America specialized in commodities. Finally, high regional trade costs may be to blame. At various points, most notably in the 1930s in response to the Great Depression, nations erected high barriers to regional trade via discriminatory tariffs, other restrictive trade and exchange control policies and discriminatory treaties favoring imports of European manufactures. Moreover, poor transportation, a lack of knowledge of local markets, poor financial infrastructure, and even preferences biased towards European goods may have limited the scope for Latin American trade.

Whatever the causes for low regional integration, these limitations on market access might have hampered economic growth and lowered welfare in the region. Modern Ricardian models of international trade and those focused on intra-industry trade posit that productivity should be positively correlated with market access. Other trade models generally predict that welfare can rise as trade barriers fall. In this case, a South American/Southern Cone Free Trade Area (proposed as early as 1889) might have been a viable way to improve economic growth and/or raise welfare. Remarkably, the emergent view from the 1920s was that international integration and industrial development were antithetical. This belief drove policy in South America for decades following World War II. The question is whether the emerging domestic industrial bases of many Argentina, Brazil, Chile, and others in the region, could capture market share at home *and* in neighboring countries. If so, then broadening the market and improved productivity could have been hand maidens of greater prosperity.

Of course, Prebisch, Singer and the viewpoint most often associated with ECLA, held that the international division of labor forced Latin America into commodity production and eventually limited economic growth and the gains from trade. The

prescription was for nations to forgo foreign supply and to incentivize domestic industry. The hope was that this would promote the fortunes of industry via targeted trade policy. Policies discriminated against foreign producers and national primary producers alike. As much of the literature shows, this policy did not lead to astounding success over the long-run especially compared to the experience of South East Asia. There are many reasons for this apparent failure which we do not intend to delve into in this paper. Instead, we focus on the feasibility of generating greater regional trade in South America in the 1910-1950 period and whether this might have happened via improved productivity and competitiveness or *lower* rather than higher trade costs.

To study this issue, we present evidence on the level and evolution of international integration comparing a sample of South American countries against countries outside of the region. To do this we first consider the evolution of trade costs as defined in Head and Ries (2001) which include a broad range of barriers to trade including freight rates, tariffs, non-tariff barriers, information costs, consumer preferences, beachhead costs of establishing new markets etc. In contrast with the work of Jacks, Meissner, & Novy (2010, 2011) who relied on the Head-Ries measure of trade costs to look at integration over the long run for a set of leading countries, we focus on a set of less developed countries in a period of de-globalization with several sizeable shocks to the world economy. We find evidence that despite their propinquity, South American nations had much higher trade costs between themselves than with their non-South American trade partners in almost every year between 1910 and 1950.

Despite these high levels, there are interesting periods in our sample when regional integration rises. In this context, the shocks of the world wars and the economic collapse of the Great Depression made for a more favorable environment for regional economic integration in our sample of South American countries. These external shocks produced an extraordinary opportunity for South America to expand industrial output through regional integration and the substitution of domestic goods for foreign goods. We consider the war periods and the Great Depression as a series of "natural experiments" that can help provide clues as to the drivers of regional integration.

These shocks changed the demand structure in global markets as nations mobilized for and engaged in war. The Depression witnessed a deepening of autarkic policies both abroad and at home which limited international demand. The wars and the

Depression also shifted global supply patterns. European exports to international markets dropped markedly during the wars and the US acted to fill the gap. From the 1920s, new goods appeared too which may have allowed South American producers to begin production in goods that were considered "old" and less profitable by the industrial leaders. As it happens, nascent South American industry was able to make limited inroads into supplying domestic demand and began to compete in regional markets. Two potential drivers of deeper regional trade can be considered. First, a lack of global competition might have allowed regional producers who typically produced at a higher cost or with lower quality to satisfy demand. Second, changes in trade costs could transform trade patterns. As trade barriers declined in the region – especially in the late 1930s – trade might have responded positively. Higher trade costs with Europe could also have *diverted* trade into the region. Both pieces of the puzzle can help explain why trade patterns shifted during these shocks and why trade in the region was typically lower than expected even outside of wartime.

We also approach this issue with evidence from trade in the textile sector. In the 1930s and 1940s regional textile exports for Brazil rose significantly with new goods not previously exported now being purchased abroad and a larger market share abroad in goods already being sold. This dynamic reveals that both productivity and potentially trade costs, broadly defined, interacted to limit intra-regional trade.

Why then was regional trade never sustained after World War II? Why didn't the temporary shock have a long-lasting impact on trade patterns? High uncertainty about trade policy generated by domestic political considerations might have limited the investments necessary to win market share in regional markets. Greater regional trade might also have been possible had relative productivity levels advanced more quickly. Indeed, there is some evidence that productivity might have advanced had trade policy been more benign. The policy uncertainty in South America reflected a battle of ideas and interests between those who believed that domestic (industrial) producers needed to be sheltered from competition and those who believed in the project of greater integration both in primary and manufactured products. We have little light to shed on the political economy of how these debates were settled, but we do provide some evidence that a strategy promoting regional integration might have had some success had it been tried with greater vigor.

Our starting point, models based in basic new trade theory may seem anachronistic and even ahistorical. Nevertheless, these models are quite adaptable and more general than they would appear at first glance. We explain below the virtues of putting this kind of structure on the data. Furthermore, analysis of these issues in this way goes back to contemporaries. John A. Hopkins, a US economist, authored a report in 1944 for the Argentinian Trade Promotion Corporation (or the *Corporación para la Promoción del Intercambio*- CPI) discussing the importance of market size, spillovers and other forces still emphasized in the new economic geography literature. In what follows, we capitalize on modern econometric and economic methodology to assess whether regional trade had any prospects whatsoever. Along the way, we attempt to eliminate factor endowments and low incomes as two factors that might have limited trade. What we are left with is a view of international trade and development, well before the post-World War II period, that is amenable to analysis using the tools of modern trade theory.

2. Evidence on the lack of regional trade in South America

Regional trade in Latin America has long been low, especially when compared to regional trade in Europe, North America, and even Asia (see Figure 1). Figure 2 shows the share of trade among Argentina, Bolivia, Brazil, Chile, and Peru (SA5), from the export side, over total exports for these five countries. World War I brought an increase from around 5% to a maximum of almost 8% in 1918. The global crisis of the 1930s produced a drop in regional exportation from 6% in 1929, to a minimum of 4.6% in 1931, recovering to 6% in 1934. In 1938 regional trade experienced a jump upwards to 8.5%. But it was during the Second World War that regional trade significantly expanded, increasing by half up to 13.5% by 1945. By way of comparison, for five continental exporters (Belgium, France, Germany, Italy and the Netherlands) the share was roughly 23% in 1930 and Maizels (1965, p. 92) reports intra-European trade shares of 34% in 1929.

One other question could be asked at this point: how much of this regional trade increase can be attributed to any given country? Figure 3 shows the share of each South American country over total imports for the four other neighbors. Argentina was dominant over the markets of her neighbors until Second World War, with a minimum share of 3.5% in 1920 to a maximum of 15.5% in 1932. But from 1941 onwards Brazil clearly surpassed Argentina. In 1944 Brazil had a share over her surrounding markets of

18%, far from that of Argentina, which was less than 7%. Peru and Chile were also fighting for a second position on regional markets. Both countries were around 4% over regional markets during Second World War. Finally, Bolivia never represented more than 0.3%. The surprising exception during this period is Argentina. Her trade declined in the World War II period, which has often been attributed to close connections with British as well as German markets. Some have even argued that this feature created a reaction to intensify Argentina's presence in regional markets (Castillo, 1979).[1]

While the regional trade boom during World War II was heavily a Brazil/Argentina story, a significant proportion (45%) of regional trade was evenly spread across the other smaller partners. Figure 4 provides the evidence. Here we calculate the share of the rise of total regional trade in South America accounted for by each of our five South American countries. We take the three-year centered average of trade for each of the endpoints and then break these shares into the four possible destinations. Brazil accounts for 55 percent of the apparent rise with 80% or a full 45 percent of the entire rise in regional trade accounted for by a rise in Brazil's exports to Argentina. Chile contributed 21 percent to the total rise and Argentina for nearly 8 percent.

How much of this change in regional trade was driven by traditional exports such as commodities, and how much of it involved a move in favor of manufactures and industrial intermediates. As it turns out, manufactures represented almost 57% of Argentinian exports to Bolivia in 1943, 33% to Chile in 1941, 44% to Peru in 1943 and 31% to Brazil in 1946. Brazilian exports of manufactures to Argentina in 1945 reached 43%. Moreover, the weight of manufactures in regional trade for Chilean imports increased from 6.7% in 1936 to 35.7% in 1943. Clearly this was a significant increase over historical trade patterns whereby these nations relied heavily on Europe and the US for such products.

Figure 5 shows a measure of regional trade intensity for Chile in textile goods. This measure compares the share of Chilean imports of a particular industry from a given region (South American, Europe, and USA) in total imports of that industry to the share of total Chilean imports coming from that region. It is clear that regional

[1] In Pinedo's plan, Argentina declared the intention of intensifying intraregional trade as a way to overcome dependence on Europe.. Nevertheless, this desired did not come to full fruition given the new evidence presented here.

integration was low in textiles, but during World War II regional integration almost surpassed that with USA and Continental Europe. During the war, the US did not entirely fill in for the missing European trade. These data make it clear that greater regional integration, even in manufactures, was far from categorically impossible.

Despite this evidence, regional trade remained much smaller than would be expected if geography were the only constraint on trade. Figure 6 shows that a comprehensive measure of trade costs for our South American sample of Argentina, Brazil, Bolivia, Chile, and Peru was higher than that between our South American sample and five trade partners in Europe plus Japan and the US. The trade costs measure is inversely related to the share of (the product of) total trade in (the product of) expenditure on domestic output. This approach to trade integration has been studied by Jacks, Meissner, and Novy (2010, 2011) and it is closely related to the measure developed in Head and Ries (2001) in a Krugman model with monopolistic competition and a love of variety.[2] What Figure 6 reveals is that despite the fact that South American nations are on average half the distance from their European trade partners, trade costs were roughly 30% higher on average than with European trade partners. The narrowing that is visible from the 1930s suggests that major economic calamities like World War II and the Great Depression may have facilitated trade in South America.

This narrowing has many potential explanations. The most straightforward possibility would be that the cost of trade fell in this period within South America. Tariffs, non-tariff barriers, and exchange controls might have favored regional trade. Likewise, improved domestic and international transportation links might also have made commerce between these nations easier. Equally, the trade cost measure can also fall when it becomes *relatively* easy to trade such that trade is "diverted" into the region whether from domestic markets or from exports that would have otherwise gone outside of the region. For example, wartime disruptions to trade networks (beyond supply and

[2] The Head-Ries measure for any given year is given by $\tau_{sd} = \left(\frac{x_{ss} \cdot x_{dd}}{x_{sd} \cdot x_{ds}}\right)^{\frac{1}{2 \cdot (\sigma - 1)}} - 1$ where *s* indexes an exporting country, *d,* indexes a destination/importer, and x_{dd} denotes domestic absorption (proxied by $GDP_{ss} - exports_{ss}$), x_{sd} is exports from *s* to *d,* and σ is the elasticity of substitution across all goods. We assume that the elasticity of substitution equals 8 as in Jacks, Meissner and Novy (2011). This measure gives the theoretically appropriate measure of trade integration between two countries. Various underlying structures of trade including a CES demand system with an Armington assumption identifying goods by their origin, a Ricardian model of trade in homogeneous goods and a heterogeneous firms model of trade give rise to this measure. The Head Ries ratio therefore yields a measure of all the barriers to trade or trade costs that impede trade between two countries. This measure is in terms of a tariff equivalent and it includes all barriers to trade as discussed in (Jacks et al., 2011).

demand changes) and the autarkic policies of the 1930s in Europe may also be associated with higher regional trade integration and hence lower regional trade costs when measured this way. Other forces for which we have no direct evidence, but which seem less plausible, might be an increased difficulty of trading domestically which would spur international trade and a change in the elasticity of substitution such that it rose within the region. If the latter were true, then it suggests a stiffening of competition over time as goods became better substitutes for each other perhaps as industrialization took hold and so forth. While this is an interesting possibility, we assume that the preference structure and the industrial organization stayed roughly constant over time.

There are multiple other potential explanations for the poor progress of regional trade in this period. One common argument is that South American nations lacked technological complementarity, perhaps because of a similarity in factor endowments. This factor endowment driven view of the direction of international trade is hard to sustain. First, it is hard to argue a priori that the factor endowments of countries with such disparate climates and resource endowments like Brazil, Peru, and Argentina were so similar as to negate trade. While it is true that the land/labor ratios may have been relatively low in all cases, the primary products of each specific country were highly differentiated from each other. Brazil trading coffee, cotton and mate for Argentinian wheat and hides would have been a natural trade, and indeed there was a significant volume of trade in these goods. A "love of variety" in such goods could have easily generated trade were it not too costly. Even if the international division of labor forced specialization in primary goods, countries apparently still under-traded. Moreover, in terms of industrial goods, models based on a "love of variety", would also predict regional trade in proportion to economic size. The only plausible explanation for low regional integration under such an assumption is high trade costs.

Another possible explanation is that European producers supplied low-cost, high quality goods and eliminated the necessity for South-American trade in industrial goods. First, an assumption of homogenous goods is necessary to sustain this argument. Given the range of source countries for industrial goods in similar SITC codes this argument seems implausible. Moreover the trade cost terms already control for supply and demand forces. If South American productivity were low, then world supply would be low and prices would be high. This would have dissuaded foreign consumers

anywhere in the world from purchasing South American exports. Instead we see that relative to supply and demand the South American nations in our sample had a relatively difficult time gaining market share close to home. The trade cost term controls for supply and asks whether there are any further barriers to trade after accounting for supply and demand.[3]

3. The drivers of regional trade through an econometric gravity approach

In this section we explore the determinants of South American regional trade with the help of a novel data set on bilateral trade for five South American countries with seven European and North American trade partners between 1910 and 1950.[4] We use a directed gravity model of trade which itself is consistent with many different modern models of international trade. The directed gravity model attempts to explain the variance in the level of bilateral exports (or imports) as opposed to seeking an explanation for patterns of specialization. We rely on a gravity model rather than pursuing the determinants of the Head Ries trade cost measure because the latter are only defined when there is positive trade. In many instances in our sample, especially during the World Wars, trade fell to zero implying infinite trade costs. Instead, our gravity models do not ignore zero observations. We rely on a log-linear model referred to as "scaled OLS" where the dependent variable is the natural logarithm of total nominal exports in US dollars plus one. Other methods to deal with the "zeros" issue are Tobit and Poisson estimation.[5]

In Table 1 we present difference in differences regressions relating the exports, x of our five South American nations with each other and seven other trade partners to various standard gravity controls of following form:

[3] Non-homotheticities might be a problem too. If South American consumers were too poor to demand local finished goods, or could only do so at some threshold level of income, then regional trade would be reduced. We have no reason to believe this might be the case since local consumers were able to massively import consumer goods from European countries and USA.

[4] The countries are Argentina, Brazil, Bolivia, Chile, and Peru. Outside of South America we have the USA, UK, Germany, Italy, Spain, France, and Japan, which were the main trade partners for South American countries. For a detailed description on data sources see (Carreras-Marín et al., 2013).

[5] Tobit is not well adapted because it assumes the distribution below zero is simply truncated and not observed. Negative trade flows do not exist therefore Tobit is not a preferred strategy. Poisson estimation is ideal in these situations as argued in (Santos Silva and Tenreyro, 2006). However, as in many other instances, our Poisson models failed to converge uniformly in the presence of the large set of dummy variables proxying for importer and exporter characteristics in each year. Scaled OLS is a plausible way to proceed in this case.

$$\ln(x_{sdt}+1) = \beta_1(SA_{sd}) + \beta_2(SA_{sd}\cdot WAR_I) + \beta_3(SA_{sd}\cdot WAR_{II}) + \beta_4 WAR_I + \beta_5 WAR_{II} + X'_{sdt}\Theta + s_{st} + d_{dt} + \delta_t + \epsilon_{sdt}$$

Here, SA is an indicator equal to one if both countries in the pair are in our South American sample, WAR is an indicator for the periods comprising either World War I (1914-1918) or World War II (1940-1945), and *X* includes a set of traditional gravity variables that proxy for several significant trade costs highlighted in the literature. These are: the logarithm of shipping distance in nautical miles between principal ports (time-varying due to the opening of the Panama Canal), a shared language dummy, a common land border indicator, a Most-Favored Nation trade treaty indicator, and an indicator equal to one if both countries are on the gold standard. The last set of variables includes time varying controls for "multilateral resistance" with time-varying exporter fixed effects (*s*) and time-varying importer fixed effects (*d*) as well as time dummies, and a zero mean, pair-specific error term. The multilateral resistance terms control for factors that shape trade with all trade partners including productivity and demand shocks.

Regressions of this form will be used to study two hypotheses:

1. First we want to know whether after controlling for geography, other observable trade costs, and productivity, Latin American nations are less likely to export or import to each other.
2. Next we would like to explain the changes in regional trade shares during the world wars observable in Figure 2 as a means to understanding the generally low levels of regional trade. To do this, we use the wars as a natural experiment. These shocks are not obviously contemporaneously associated with shocks to South American productivity levels. Moreover, trade policy and other trade costs in South American nations did not react directly and concurrently to the shock of the wars. In this sense the wars help us to identify why regional trade was low.

While regional trade shares seem to rise during the wars, we do not know whether this is because South American nations became relatively more competitive as foreign suppliers went offline etc. (i.e., trade diversion); or whether the *relative* cost of regional trade fell. However, we can study the likely forces driving these observed changes with the structure of the gravity model.

First note that the time-varying importer and exporter fixed effects control for supply shocks that could affect international trade levels across all partners. If nations became more competitive because of relatively lower supply prices, the demand system requires trade to rise equally across all partners conditional on other observables. If the interaction terms on South America and the wars are insignificant *after* including these indicator variables, then we can argue that any rise in trade shares during the wars was attributable to changes in competitiveness. As argued above, this implies that nascent South American industry could produce for the regional market if global supply conditions were favorable or if producers could lower their relative prices or raise quality. It is also evidence that would be in direct contradiction of a strict factor endowment driven view of South American production and trade which would hold that the gains from trade would be limited in the region no matter what the level of international competition.

Assume instead that we find the interaction between the South American indicator and the war dummy to be positive and significant, *even after controlling for the level of productivity* of South American producers via importer and exporter fixed effects. This is consistent with the idea that regional trade could have advanced with policies and other actions that reduced trade costs between nations in the region. Again, this type of evidence would be inconsistent with a factor endowment driven view of trade. Such a finding would validate the proposals of various policy makers including the Pan-American Union and Federico Pinedo, finance minister of Argentina, who lobbied extensively for a regional free-trade area in the late 1930s and the early 1940s.

Table 1 investigates the exports of the South American countries in our sample with a simple difference-in-differences strategy. The "treatment" group is South American country pairs (South American exporter paired with a South American importer) and the control group is the set of country pairs that included a South American exporter and a non-South American importer. The treatments we study are the changes in global markets due to war-time disruptions in Europe. The coefficients

on the interaction terms (the South America indicator interacted with the war indicators) test whether during the war periods, intra-South American exports rose relative to all non-South American destinations. It is useful to keep in mind that during the wars, exports to the continental belligerents were severely interrupted and exports to the US and the UK surged.

The question the regression helps us answer is whether conditional on changes in GDP (productivity, prices, and other inputs) and other trade costs, these rises in regional trade were statistically and economically significant. These changing trade patterns and the gravity framework allow insight into the drivers of Latin American trade. One possibility is that although there were no significant changes in formal trade barriers obviously correlated with the wars in our South American countries these periods regional trade might have become relatively less costly than trade with non-South American countries. If so, then the interaction terms can be expected to cleanly identify the expected change in trade in the case that regional trade costs fell.

Assume instead that Latin American exporters were able to increase market share globally, or in equal measure to South American and non-South American markets due to the absence of price competitive European suppliers. Time-varying country dummies also control for sources of variation in trade due to the potential trade diversion effects of wars, and other shocks, not directly affecting any given country pair but affecting exports to all countries or imports from all sources. War-time demands may have affected overall supply and demand for Latin American products since they were unscathed by outright warfare. The wars also severely restricted and altered continental demand and supply patterns, the US and UK markets were also affected. British expenditure on foreign goods rose to help fight the war while supply was generally restricted both for the home and foreign markets. In the US, while income and expenditure on imports rose, supply also surged and exports were diverted to Latin America.

The traditional gravity equation in column 1 of Table 1, includes GDP terms for both the exporter and the importer but not time-varying indicator variables which would allow for multilateral effects and trade diversion. Results on controls for bilateral trade costs can be biased upwards as in Anderson and van Wincoop (2003). Column 1 reveals that exports between South American pairs were significantly higher during both wars just as Figure 2 showed. We should not interpret this as evidence of a reduction in the

barriers to trade between Latin American countries. We simply are not controlling properly for the level of overall competition in the global markets. It could be the case that the elimination of European competition, and other supply and demand shocks, made it easier for Latin American firms to compete in other Latin American markets.

Column 2 investigates this by including a full set of time-varying importer and exporter fixed effects. Here, there is no evidence that intra-South American exports grew faster than those to non-Latin American destinations during the wars. In other words, column 1 seems to mistake bilateral trade cost changes for what are, in reality, changes in the structure of market competition. This result fits well with the fact that exports from most of South America to the US and the UK also rose during the wars due to the increasing demands associated with the war.

Table 2 repeats this exercise but uses only South American importers. These countries receive imports from two sources: South America and non-South American sources. Column 1 of Table 2 suggests that South American imports from within the region rose faster than non-South American imports during both wars. In column 2, after including a full set of controls for supply and demand changes as above, we find that the rise in imports in Latin America during both wars was significantly higher compared to the reference group (imports from non-South American sources). The simplest explanation is that European imports were limited during the wars and South American imports replaced them. However, it appears that trade is being affected by forces beyond the lack of supply. In addition to a lack of European supply, it is likely that it became relatively more costly to source goods from the European nations in our sample. It is interesting to note that the US is included as an exporter to Latin America in this specification. While its market share might have risen, it did not rise sufficiently to completely offset the loss of European supply. Some substantial fraction of supply was replaced by Latin American producers in both wars.

The results in Tab. 1 and Tab. 2 may still be mis-leading about the drivers of regional trade if shocks to demand and supply during the wars differentially affected Latin American economies. In Tab. 3 we explore a more punishing estimation strategy. Here we look at a "triple differences" specification, so that the rise in regional exports in South America during the war is compared not only to changes in South American exports to non-Latin American destinations, but also to US or UK exports to

destinations both in South America and in Europe. The estimating equation in this case is:

$$\ln(x_{sdt}+1) = \beta_1(SA_{sd}) + \beta_2(SA_{sd}\cdot WAR_I) + \beta_3(SA_{sd}\cdot WAR_{II}) + \beta_4 SA_s + \beta_5 SA_d + \beta_6 WAR_I + \beta_7 WAR_{II} + X'_{sdt}\Theta + s_{dt} + d_{dt} + \delta_t + \epsilon_{sdt}$$

This approach is similar in spirit to the "tetradic" approach of (Head, Mayer, & Ries, 2010) and to a specification explored by Jacks (2011). In column 1 and in column 2 we find intra-South American trade was generally low throughout the period even after controlling for supply, demand and competitive forces. This reinforces our initial observation that intra-South American trade was substantially lower than standard gravity controls would predict.

In columns 3 and 4 of Table 3 we find limited evidence that South American countries increased exports faster to each other than the US (column 3) or the UK (column 4) did during the wars. Only in World II, and when the comparison country is the US, do we find evidence that trade cost declines explain the rise in trade. Otherwise the data seem to show that any rise in regional trade during the wars was strictly due to changes in competitiveness and market dis-locations.

In columns 5-8 we include two other time periods in which shocks rattled South American markets. The first is the interwar period 1920-1928 and the second is the Great Depression period (1929-1938). Columns 5 and 6 show that during the inter-war South American exports to other countries in the region were actually displaced - as US imports rose, European countries recovered and domestic markets became more heavily protected. On the other hand, the Great Depression (and the recovery period) is associated with an improvement in trade relations in South America when compared to changes in other countries and in other periods. In these years Germany, the British Empire and the US closed ranks and protected their domestic markets retreating into autarky and evidently pushing South American exports back into the region. Apparently the Roca-Runciman treaty and closer US-Brazil ties could not overcome other trends promoting regional integration. Columns 7 and 8 reveal that the comparison period is crucial since here both World Wars are also associated with a strong revival of South

American trade. This revival is not visible in the other columns presumably because the revival during the wars was not notably stronger than that of the 1930s. However in columns 7 and 8 the only comparison periods are the 1920s and the 1945-1950 period. Overall then, Table 3 suggests that both competitiveness and trade costs played a role in determining the level of South American integration.[6]

We can also decompose the changes in bilateral trade amongst dyads in South America as in Jacks et al. (2011)

$$\Delta\ln(x_{sdt} \cdot x_{dst}) = 2\Delta\ln(y_{st} + y_{dt}) + \Delta\ln(\theta_{st}\theta_{dt}) + 2(1-\sigma)\Delta\ln(1+\tau_{sdt}) + \Delta\ln\left(\frac{x_{sst} \cdot x_{ddt}}{y_{st} \cdot y_{dt}}\right)$$

where $\theta_{st} = y_{st}/(y_{st} + y_{dt})$ is the country s share of pair GDP, Δ denotes that we take differenced between period *t* and the the base year, and we use the fact that $y_{st}y_{dt} = (y_{st} + y_{dt})^2\theta_{st}\theta_{dt}$. This decomposition tracks the changes in trade due to changes in output (size and productivity), similairty in size of GDP, trade costs and multilateral effects that change trade with all partners. The multilateral factors explain changes in domestic trade relative to total output such that, if the ratio is constant, domestic trade expands at the same pace as international trade with all partners and overall production. We take a weighted average across all South American dyads using the sum of the partners' GDP in sample GDP as weights.

Table 4 presents results for the two war periods. In each instance, the bulk of the changes is explained by output and trade costs. Changes in multilateral forces explain less than four percent of changes in World War I and almost nothing during World War II. Similarity in economic size is also a minor player. Trade costs play a larger role in the World War II period (53%) than in World War I (18%). Consequently the change in output explains the greater portion of trade in the World War I period. We interpret these findings as evidence that supports the idea that wartime disruptions to global markets made bilateral trade within South America realtively less costly. Trade costs matter. Second, boosting output by raising productivity could have contributed substantially to intra-South American trade. This finding holds constant what is

[6] Results in Tables 1, 2, and 3 are qualitatively robust to omitting the dyads that include both Brazil and Argentina. One might have feared our results relied on this important pair of countries whose leaders attempted closer trade relations in the late 1930s and early 1940s. Additionally, an ongoing trend of closer integration in the included South America pairs is visible in Figure 6. We allowed for South American time trend. Again, results are qualitatively similar to those in columns 3 and 4 of Table 3.

happening in world markets. The decomposition suggests a role for competitiveness as described above. After accounting for the size terms, multilateral forces play a very small role. We conclude that it was not simply the disappearance of European competitors that allowed for greater integration in our South American countries. For mulitlateral effects to have been important, exports to all partners would have had to increase faster than GDP. While South Americans gained market share with some partners trade plumetted in others. The structrue of the demand system forces us to attribute changes in trade to changes in trade costs and economic size as the leading explanations for rising trade shares in South America than third market effects. Given the generality of the demand system, these results are likely to be fairly robust.

The preceding regression results and the accounting exercise provide some hints as to why the South American countries we study persistently traded less than would be expected after controlling for obvious geographic barriers to trade. We infer that high supply prices, low productivity and potentially low quality kept intra-Latin American trade at low levels. However, relative trade costs were probably generally high. During the wars, trade barriers vis-à-vis South American trade partners may or may not have changed substantively but *relative* trade costs did seem to have changed. Rises in market share were due to the opportunities available when European producers were off-line. This suggests that South American exports could compete in other South American markets if external conditions allowed. Both increased regional integration via policy changes and attempts to build industry from the ground up might have allowed for further industrial growth by broadening the market for local products prior to 1950.

4. Direct Evidence on Trade Costs

As we have argued above, there is some evidence that trade costs mattered for South American integration. Despite their geographic proximity and shared institutional backgrounds, many of these countries traded more heavily with distant industrial powerhouses such as the US, UK, France, and Germany. One reason for these differences may be that shipping between Europe and South America seems to have been easier than shipping between countries within the region. At the beginning of our period even internal communications were fraught. In 1910 Freight rates per ton of

cotton goods via the English-flagged Booth Lines or the Lloyd Brazileiro were quoted as follows: Liverpool-Para (4,290 miles) $12.76; New York-Para (3,380 miles) $14.52; Rio de Janeiro-Para (2,406 miles) $12.27. Freight rates per ton of cotton goods via ship to Manaus were as follows: Liverpool-Manaus (5,150 miles) $16.04; New York-Manaus (4,240 miles) $17.16; Rio de Janeiro-Manaus (3,266) $34.16.[7]

International shipping companies provided high tonnage shipping services with or without fixed time tables, but charged anti-competitive rates in the so-called conference agreements. Still, no country in South America had any significant merchant marine fleet in the time period we study and this raised rates even more.[8] Most trade between nations like Brazil and Argentina would have had to have been carried by European or American vessels stopping in Brazilian ports and then carrying on to Argentinian or Uruguayan ports. Not all American or European freight companies travelled such routes. Otherwise, regional trade relied on infrequent departures of small-tonnage vessels flying regional flags.

Brazilian trade statistics from 1903 (Servicio de Estatistica Comercial, 1905, p. 223) slightly before our period, report the number of ships landed in Brazil by flag and the total number of tons of merchandise traded for all ships landed. From these statistics, we see that in a regression of the logarithm of tons shipped on the log of distance, the coefficient on distance is 0.96 (standard error of 0.46, p-value = 0.06). We can then decompose total tons shipped into the number of ships landed and the number of tons per landing. In a regression of the logarithm of the number of ships landed on distance the coefficient on distance is small (0.04, standard error of 0.39) and not statistically significant. The number of tons per ship landed is still (strongly) positively correlated with distance (coefficient = 0.92, standard error = 0.16, p-value =0.00). In effect, European landings involved larger vessels which presumably pushed down the ton-kilometer unit shipping costs.[9]

[7] Graham Clark (1910).

[8] Sanderson (1940) reported that "with the exception of a few Argentine ships which operate between Argentina and Paraguay, Uruguay and Brazil, the country's foreign trade is transported by ships of other nationalities". Chilean official trade statistics showed that for 1912, less than 10% of total tonnage was on South American ships and less than 20% of the vessels were South American.

[9] Chilean trade was carried mainly by European ships which were bigger than South American ships. German and British ships transported, on average, more than 3,000 tons per shipment compared to the 1,500 tons carried by Chilean ships, 1,600 tons for Argentinian ships, or 2,600 tons for Peruvian ships.

Although intra-South American freight rates might have been high, the wars changed relative freight rates dramatically. The US Bureau of Foreign Commerce studied shipping at the outbreak of the war noting that the rise in freight rates from the US to the east coast of South America was only a fraction of the rise in European freights to the same area. In particular freights on liners from the US to this region rose 20% from autumn 1939 to May 1940 while tramp freights for coal (on non-US and non-Brazilian flagged vessels) rose 260 percent (Sanderson, 1940 p. 7). The rise in freight between July 1939 and April 1940 from US Atlantic ports to Antwerp vs Rio on automobiles (boxed) was 706% vs. 22%; on tobacco for the same routes the rises were 329% vs. 12%; for Le Havre the rise were 158% (automobiles) and 185% (tobacco); for London the rises were 150% (automobiles) and 200% (tobacco). Automobile freight rates to Valparaiso from US Gulf Ports had not moved between these two dates. Meanwhile canned goods freights from the US west coast to London had risen 50% while those to Buenos Aires had risen only 11%. Clearly, relative freight costs had risen much more on European-South American routes than on US-South American routes. Furthermore, quantity rationing occurred which added non-pecuniary and indirect costs to shipping and hence to trade. On the Argentine-British routes. many ships were given official rates and essentially commandeered. On neutral vessels, rates were even higher but delays and inspections caused logistical problems. Insurance charges for boats not travelling in convoy also contributed to high trade costs. In Peru, where time charters and liners dominated, a number of the shipping "conferences" that had previously served Peru (e.g., European/South Pacific Magellan) ceased to function. The disappearance of anti-competitive pricing did not mean lower rates though. This route reported rate rises of 50% to 400%. On the other hand, traffic between Peru and the US witnessed rate rises of 20%. Since the liners that served Peru from the US often served other nations like Chile and also the Rio de la Plata, inter-regional rates would be expected to rise much more modestly than on the European routes.

In terms of trade policy, many significant changes took place in the 1910-1950 period. Chile raised tariff rates on a host of industrial products beginning in the 1920s. The onset of the Great Depression led quickly to the imposition of exchange controls. Brazil ordered exporters to sell 30% of earnings to the government at the official (overvalued) exchange rate. The executive in Brazil exercised considerable discretion in granting reductions and permits to importers (Bulmer-Thomas 2003). Argentina and

Chile also implemented exchange controls in the 1930s equally protective of domestic producers in selected industries (for Chile see Diaz and Wagner, 2004). While we have already shown that MFN treaties were not statistically significant other attempts were made to improve trade relations in the 1930s. We have been able to build another measure of commercial and diplomatic ties for Argentina and 19 of its trade partners.[10] This variable includes a wide variety of diplomatic ties such as friendship agreements, trade facilities, regulations on migration, railway connections at border, diplomatic post exchanges, mutual recognition of professional training levels or cultural promotion.[11] The pace with which Argentina signed these treaties increased from the early mid-1930s. . Here we have counted the cumulative number of treaties signed with each partner We then used this as an explanatory variable in a regression of Argentina's exports to each of these partners between 1910 and 1950. Table 5 column 1 shows that the cumulative number of treaties was a significant determinant of trade. Columns 2 and 3 show that the South America/World War II interaction term captures some of the reduction in trade costs due to closer diplomatic ties since the addition of the treaty variable to the regression in column 3 reduces the magnitude of the interaction term for World War II.

These treaties may have been associated with closer trade relations and the higher intra-regional trade shares in the 1930s and early 1940s already highlighted above. How big was their effect? Figure 7 graphs the percentage difference between a counterfactual level of total Argentinian trade with all South American partners and the actual value in each year after 1932. In the counterfactual, we assume that the number of treaties signed remained constant at 1932 levels. Argentina's cumulative treaty count for countries within the region vastly outpaced the count for non-South American trade partners. This signaled a potential for policy-driven integration in the region. Our counterfactual calculations show that this expansion of diplomatic ties can account for a significant portion (over half) of the rise in regional trade. Of course this is a partial equilibrium calculation and after taking account of general equilibrium effects these results would be expected to be much smaller.

One may also worry about endogeneity bias. The impact of treaties could be biased upwards if Argentina chose to sign treaties with countries with which it already

[10] These are: Belgium, Bolivia, Brazil, Canada, Chile, Denmark, France, Germany, Italy, Japan, Netherlands, Norway, Peru, Portugal, Spain, Sweden, Switzerland, UK and the US.
[11] See (Ministerio de Relaciones Exteriores y Culto (República Argentina), 2014)

had, or was setting in train, strong trade relations for other unobservable reasons. We lack a convincing instrumental variable given the nature of our observational data. However, we did allow for up to three leads and three lags of the cumulative treaty variable. If trade were higher in advance of the rise in the number of treaties, then we might suspect a positive endogeneity bias. However, none of the leads were in fact statistically significant, and all point estimates on the leads were smaller than the contemporaneous value reported in columns 1 and 3 of Table 5. This suggests that trade was not exceptionally high in places where treaties were signed. Additionally, we find some evidence that signing treaties had a gradual effect. The contemporaneous treaty variable rises in magnitude to 0.05 and the first lag is 0.04 both of which are statistically significant. The second and third lag are estimated at -0.04 (p-value = 0.21) and -0.01 (p-value = 0.679). Based on this, we are comfortable with the idea that endogeneity bias is not massively affecting our inference. Still, another potential check on endogeneity is to allow for country-pair specific fixed effects which would eliminate any time-constant unobservables at the country-pair level. Here the results are less reassuring in terms of endogeneity bias. We find a positive point estimate of 0.003 but it is not statistically significant. It is plausible conclude that Argentina's diplomatic relations had little effect on the direction of trade based on these results. These results are also consistent with the findings from Table 1 and Table 2 that MFNs did little to promote aggregate trade flows.

5. Some insights from the textile industry: Substitution of foreign manufactures during the wars?

The preceding econometric analysis seems to point out the importance of both competition in international markets and trade costs as key drivers of regional trade. The World Wars, the Great Depression and the economic dislocation of each post-war period provided several opportunities for regional trade to grow. In all of these episodes, substitution of regional goods for extra-regional imports was a natural reaction to foreign trade shocks. Of course, the trade disruptions were not uniform across trade partners. Demand in Europe changed to varying degrees for the belligerents. While British and US demand for raw materials and finished goods surged, continental

partners declined as autarky, blockades and sanctions set in. At the same time, the supply of finished goods and industrial inputs from Europe declined dramatically leaving the US and regional partners to fill the gap.

In this section, we attempt to continue our investigation of the drivers of regional trade by zooming in on the textile industry.[12] During the periods of global disruption, substitution of foreign manufactures could have come in two forms: imports from neighbors or increased domestic production. The textile industry can shed some light on the possibilities for export-led growth via reduced trade costs and improved competitiveness. During the wars production and intra-regional trade in these goods expanded. Figure 8 shows the shares for Chilean textile importation. Over the long-run, British goods followed a decreasing tendency (from 42% in 1913 to 11% in 1947) at the same time as USA was increasing its share in the Chilean market (from 3% in 1913 to 36% in 1946). Our South American countries increased their share during the World War I (from 1% in 1913 to 7% in 1918) but an even stronger boom occurred in the 1940s (from 3% in 1940 to 46% in 1945). Among these five countries of South America, Argentina was predominant in exports during World War I. Meanwhile during the 1940s it was dramatically replaced by Brazil. International trade in the region has sometimes been described as a battle between Argentina and Brazil for regional political and economic hegemony, both trying to escape from the UK US dominance. And in fact, from the 1930s, both Argentina and Brazil competed for regional market share by signing bilateral treaties and through ad hoc incentives via exchange control and micro-changes to tariff lines. Whatever the case, Brazil clearly had a leg up in the textile industry, and its local industry had long been able to compete (i.e., from World War I) against European competitors in its domestic market in the coarser grades (Huberman, 2013).

However, in the 1920s, the Brazilian experience has often been characterized as an "export failure" not because of domestic determinants, but due to changes to

[12] One reason to study textiles in more detail is that it is the quintessential leading sector in a nascent industrialization process, often being the first one that will compete with foreign production, first in the domestic market, and secondly in external markets. In addition, the textile sectors represented an opportunity for moving to a higher value added trade pattern in Latin America, in contrast with an historical specialization on commodities. Additionally, there may be a product-cycle component to trade whereby the leading nations focused on more complex, knowledge-intensive goods or more capital-intensive goods after World War I leaving space for competition from regional producers. Brazil had the most sophisticated and largest textile industry in Latin America with a domestic textile industry ranked 7th in terms of production in 1918 (Huberman, 2013).

international markets (Huberman, 2013). During the Second World War, these nations lived an entirely different experience. British textiles collapsed after 1941 providing an opportunity for US and regional exporters to increase their market share. During World War II, trade diversion seems to be an important part of the story. However, far from providing a long-lasting boost to industry any gains that nations reported were temporary. Import shares from non-traditional supplies declined swiftly when the conflict ended.

Bilateral trade between Argentina and Brazil constitutes the greater part of South American trade. Even nowadays it is the most important share of regional trade for Mercosur. Accordingly, we analyze this particular trade flow in more detail. Figure 9 shows how important Argentina was for Brazil as a trade partner, based on Brazilian sources. We can clearly see the increase of Argentina as a market for Brazilian exports, especially during both wars.

Figure 10 shows that prior to the 1930s, Brazilian exports to Argentina were mainly of *Mate de hierba buena*. Mate's trade share fell gradually as Brazil diversified its exports to Argentina. But it was only during World War II that textiles increased their share of Brazilan exports to Argentina. As Mate was a traditional domestic product, it had no easily substitutable foreign goods. On the contrary, textiles could be substitutable for foreign goods.

Figure 11 shows some key indicators of the evolution of the textile industry in Brazil and the relationship between domestic and external supply. Data is expressed in quantities (meters of cotton fabrics). The left vertical axis shows data of industrial production and apparent consumption. The right vertical axis shows trade data figures. The domestic market was 80% covered by domestic production during the entire period. Imports were around 15% before World War I falling to around 5% during the conflict. They remained more or less at that level during the 1920s. After the early 1930s, textile imports dropped, claiming an insignificant share of the domestic market. At the same time, evidence of either Brazilian prodcutivity improvements or significant declines in trade costs with major trading partners is visible. Brazilian textile exports began to grow strongly in this period. Textile exports were less than 1% of domestic production until

1939. By 1942 Brazil exported 14% of her domestic production such that about 5-10 percent of total production was being exported to Argentina.[13]

Figure 12 shows Brazilian textile trade in constant values. We can see that World War I led to a significant increase in exports, but imports from abroad were higher and they were also increasing. In 1925 a breakpoint occurred in textile exports. Huberman (2013) explains the textile performance of Brazil using that year as a breakpoint. According to him, the period before 1925 was one of increasing capital investments in the textile industry and at the same time an upward trend in the quality of textile production. That it is said to have happened as a main reaction to labour regulation in the industry, similar to the Belgian experience before the First World War. Starting from 1925, foreign markets collapsed and the country began to adopt an inward looking development strategy.

We can also add a prologue to Huberman's (2013) story. From the 1940s, Brazilian exports finally managed to increase at the expense of European competition through regional integration. The extraordinary environment of the war opened an oportunity to free competition in the regional markets for Brazilian textile exports. In this period, Brazil also increased the extensive margin of exports. The number of textile goods being exported to Argentina increased from one to six items in World War I. During World War II the number of goods increased from six to 32. Product diversification went hand-in-hand with a geographical diversification of trade partners. In 1913, Brazil exported textiles to Argentina (94%), Uruguay (4%) and UK (2%). In 1918 the number of trade partners increased to eight (Argentina, Uruguay, Peru, Paraguay, Bolivia, UK, France and Italy). The downturn of 1925 meant a decrease of the number of countries to four (Argentina, Peru, Bolivia and UK). By 1945 however, exports had recovered with Brazil exporting to 50 countries in Europe, America, Africa and Asia. No other country in the region was able to extend its range of goods and geographic extension as much as Brazil. Morever, within the region, it would appear that trade diversion and productivity were the greatest drivers of rising market share. If trade costs were relatively close to symmetric, and a love of variety existed, then one would assume that exports of Chile and Argentina to Brazil would rise – at least fractionally. Instead any rise in the export share of these countries was conentrated on more traditional goods rather than in these

[13] A similar pattern is observed by Chile during the I World War and the 1920s. Most of domestic production of textile was stagnated and imports importance in total consumption remained stable (see (Palma, 1979)).

new industries. All of this is consistent with Table 1 which studied total exports of South America during the wars and found little evidence of a decline in regional trade costs.

Brazil's path to succes might also have been founded on an improvement in quality rather than simply on price competition. Unit export values, shown in Table 6, can be used as an indirect aproach to changes in qualities. Until 1926 unit values increased probably as a consequence of negative changes productivity. From 1927 until 1933 unit values decreased as Brazilian productivity increased and the Depression suppressed demand. From 1934 to 1946, the trend was upwards again despite uneven global demand during the war years. This evidence fits well with Huberman's explanation but goes beyond it by providing some evidence from the 1930s and beyond.

The remaining question is why after 1945 regional trade gave ground so quickly. Weaknesses in Latin American industrialization have been emphasized in this regard. In general, industry diversified during the 1930s, but it was not able to fully replace the importance of the primary sector. Low productivity has been highlighted by the literature as the main obstacle. This had various causes including scarcity of cheap energy, a lack of a qualified work force, and the use of outdated machinery. A UN report of 1951 highlighted an "excess of labour" and low wages as the main causes for low productivity also citing a lack of managerial and organizational skill. Bulmer-Thomas (2003) also introduces the problem of shortages on capital importation and inflation, as well as the idea that industrial growth based on gains in (regional) foreign market share was not sufficient to achieve economies of scale. Instead, for Latin America, growth relied as much on protectionism, import restraints and public subsidies as it did on export markets. Bértola and Ocampo (2010) argue that high macroeconomic volatility and insufficient domestic demand also had negative effects on Latin American industrialization.

6. Conclusions

The poor performance of regional trade in Latin America is a long-lasting story as its historical roots are currently part of international debates on the merits of regional trade. Liberalization efforts since the 1990s have not been sufficient to strongly promote regional integration. In 2000 the share of total imports for Argentina, Brazil, Chile and

Uruguay coming from these same countries equaled 18% (World Trade Organization & UNCTAD, 2012, p. 28) versus a share of 27 percent coming from the NAFTA countries. Between 1910 and 1950 our data show that the share of imports from South America averaged 11% with a maximum of 24.5% in 1944. While some progress has been made, more distant trade partners remain more important in this region. Recently some authors have argued that more attention should be paid to removing non-traditional obstacles to trade such as poor investment in regional transport infrastructure (Mesquita Moreira, Volpe, Blyde, & Martincus Volpe, 2008). We bring new insight to this debate from an extraordinary historical period of regional trade, that of 1910-1950.

Regional trade in the Southern Cone of Latin America experienced an increase during the shocks that hit during this period. World Wars, especially World War II, allowed regional trade to rise (Carreras-Marín, Badia-Miró, & Peres Cajías, 2013). In this paper we explore the drivers behind this phenomenon. Following (Jacks et al., 2010, 2011) we have estimated relative trade costs for a sample of South American countries (Argentina, Bolivia, Brazil, Chile, and Peru) within the region and with their main trade partners outside the region. We find that trade costs were always higher between these countries than with more distant partners, but that during the wars these fell. This is because of concerted effort to remove the policy-driven barriers to trade, but also because it became relatively more costly to trade with those nations directly involved in the war. We also find some evidence consistent with the idea that South American trade lagged because of low productivity and high prices or low quality.

We also take an approach to this question using data from the textiles industry. During World War I, substitution was mainly focused on the domestic market. However, in World War II, South America increased exports to neighbors. Nevertheless this increase was not persistent. Once the war finished, these gains in market share were surrendered. South American nations failed to commit to permanently low trade barriers by signing a definitive regional trade agreement much less going in for a fully fledged customs union. Without these incentives, the necessary investment of gaining knowledge of these markets was not made. Nations also failed to raise the investment needed to introduce newer and less costly products that could compete with extra-regional substitutes. Again, relative trade costs and third country competition seem to be the drivers here. It remains to be seen whether greater regional market access could

have provided the foundation for enhanced productivity performance or whether trade policy to shelter domestic producers might have made a difference.

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Table 1 - Latin American Exports, 1910-1950

	Column 1	**Column 2**
Importer in Latin America	-0.54	0.34
	[0.373]	[0.784]
Importer in Latin America x World War I	0.42*	-0.16
	[0.228]	[0.595]
Importer in Latin America x World War II	1.04**	-0.5
	[0.417]	[0.840]
ln(GDP) exporter	0.70***	---
	[0.083]	
ln (GDP) importer	0.66***	---
	[0.128]	
ln(distance)	-1.04***	-0.98***
	[0.272]	[0.199]
MFN treaty	0.13	0.11
	[0.209]	[0.153]
Both on the Gold Standard	0.43***	-0.16
	[0.136]	[0.182]
Shared border	0.38*	-0.05
	[0.222]	[0.288]
Shared Language	-0.18	0.02
	[0.210]	[0.257]
Number of Observations	2,460	2,460
R-squared	0.594	0.848
Time-Varying Country-Fixed Effects	No	Yes

Notes: Dependent variable is the logarithm of one plus the value of nominal exports of all South American countries in our sample. Destinations include South American countries and non-South American countries. Robust standard errors are reported in brackets. In column 1, standard errors are clustered on importers and exporters. In column 2 standard errors are clustered on the country pair. Time dummies and world war period dummies are included but not reported. Time varying country fixed effects are included in column 2. *** p-value<0.01, ** p-value < 0.05, * p-value < 0.1

Table 2 - Latin American Imports, 1910-1950

	Column 1	**Column 2**
Exporter in Latin America	-0.36	-3.05***
	[0.315]	[0.391]
Exporter in Latin America x World War I	0.48***	2.50***
	[0.166]	[0.641]
Exporter in Latin America x World War II	1.26***	3.90***
	[0.334]	[0.715]
ln(GDP) exporter	0.70***	---
	[0.110]	
ln (GDP) importer	0.65***	---
	[0.114]	
ln(distance)	-0.93***	-0.81***
	[0.248]	[0.175]
MFN treaty	0.12	0.08
	[0.194]	[0.123]
Both on the Gold Standard	0.34***	-0.02
	[0.129]	[0.161]
Shared border	0.39**	0.45*
	[0.183]	[0.238]
Shared Language	-0.03	-0.02
	[0.138]	[0.271]
Number of Observations	2,460	2,460
R-squared	0.648	0.889
Time-Varying Country-Fixed Effects	No	Yes

Notes: Dependent variable is the logarithm of one plus the value of nominal imports from all South American countries in the sample. Source countries include 5 different South American countries and 8 non-South American countries. Robust standard errors are reported in brackets. In column 1, standard errors are clustered on importers and exporters. In column 2 standard errors are clustered on the country pair. Time dummies and world war period dummies are included but not reported. Time varying country fixed effects are included in column 2. *** p-value<0.01, ** p-value < 0.05, * p-value < 0.1

Table 3 - Bilateral Exports, Triple Differences Models, 1910-1950

	LATAM + US	LATAM+ UK	**LATAM + US**	LATAM +UK	**LATAM + US**	LATAM +UK	LATAM +US	LATAM+ UK
Both Countries in Latin America	-6.59***	-5.16***	-6.14***	-4.41***	-0.01	-0.90*	0.06	-0.76
	[0.715]	[0.548]	[0.591]	[0.608]	[0.358]	[0.496]	[0.380]	[0.535]
Both in Latin America x World War I	---	---	-0.47	-0.13	-0.58	-0.23	1.76**	1.66**
			[0.732]	[0.757]	[0.610]	[0.733]	[0.798]	[0.736]
Both in Latin America x 1920s	---	---	---	---	-2.48***	-2.81***	---	---
					[0.538]	[0.645]		
Both in Latin America x 1929-1938	---	---	---	---	---	---	1.77***	2.78***
							[0.500]	[0.748]
Both in Latin America x World War II	---	---	4.14***	1.11	1.23	2.27***	5.95***	6.18***
			[1.098]	[0.786]	[0.912]	[0.762]	[1.194]	[0.897]
ln(distance)	-0.89***	-0.43***	-0.88***	-0.43***	-0.88***	-0.43***	-0.88***	-0.43***
	[0.183]	[0.160]	[0.184]	[0.160]	[0.184]	[0.160]	[0.184]	[0.160]
Shared border	0.09	0.47*	0.1	0.47*	0.1	0.47*	0.1	0.48*
	[0.278]	[0.249]	[0.279]	[0.249]	[0.279]	[0.249]	[0.279]	[0.249]
Both on the Gold Standard	-0.16	-0.05	-0.16	-0.05	-0.16	-0.05	-0.16	-0.05
	[0.155]	[0.167]	[0.154]	[0.166]	[0.153]	[0.166]	[0.155]	[0.166]
Shared Language	0.23	0.18	0.23	0.18	0.23	0.18	0.23	0.18
	[0.169]	[0.175]	[0.169]	[0.175]	[0.169]	[0.175]	[0.169]	[0.175]
Number of Observations	2,952	2,952	2,952	2,952	2,952	2,952	2,952	2,952
R-squared	0.843	0.848	0.848	0.849	0.849	0.849	0.848	0.849
Time-Varying Country-Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Dependent variable is the logarithm of one plus the value of nominal exports from all countries in the sample to all countries in the sample. Source countries include 5 different South American countries and 8 non-South American countries. In columns 1,3, 5 and 7 the source countries are those in South America and the US. In columns 2,4,6, and 8 they are those from Latin America and the UK. Robust standard errors clustered on the country pair are reported in brackets. Time dummies and World War period dummies are included but not reported. Various other interaction terms are also included but not reported Time varying country fixed effects are included in all specifications. *** p-value<0.01, ** p-value < 0.05, * p-value < 0.1

Table 4- Decomposition of Trade Changes in South American During Two World Wars

Variable	Avg. change, 1913-1919	Contribution from each variable %	Avg. change, 1939-1945	Contribution from each variable %
Total Trade Growth =	1.75	100	1.95	100
Change in Output +	1.35	77.29	0.89	45.69
Change in Trade Costs +	0.32	18.26	1.05	53.53
Change in Income Similarity +	0.02	0.86	0.01	0.74
Change in Multilateral Factor	0.06	3.59	0.00	0.04

Notes: Changes are calculated as the average of the change in the logarithms of each variable. They are presented in log points. These changes are weighted averages for 9 South American dyads (1913-1919) and 10 South American dyads, (1939-1945). Weights are the sum of the dyad's GDP values.

Table 5 - Argentina, Bilateral Imports and Exports with Cumulative Treaties Signed, 1910-1950

Partner in Latin America	-0.65**	-0.89**	-0.87***
	[0.309]	[0.353]	[0.325]
Partner in Latin America x World War I	---	0.33	0.98***
		[0.252]	[0.326]
Partner in Latin America x 1929-1938	---	-0.18	0.22
		[0.274]	[0.287]
Exporter in Latin America x World War II	---	0.90***	0.48
		[0.272]	[0.309]
Cumulative Treaties	0.04***	---	0.04***
	[0.013]		[0.014]
ln(distance)	-1.28***	-1.21**	-1.28***
	[0.483]	[0.585]	[0.479]
Shared border	-1.87**	-0.7	-1.88**
	[0.748]	[0.680]	[0.739]
Both on the Gold Standard	0.60***	0.51**	0.59***
	[0.219]	[0.214]	[0.214]
Shared Language	-0.61**	-0.27	-0.62**
	[0.236]	[0.203]	[0.243]
ln(GDP) exporter	0.62***	0.69***	0.62***
	[0.087]	[0.083]	[0.089]
ln (GDP) importer	0.59***	0.66***	0.59***
	[0.140]	[0.149]	[0.140]
Number of Observations	1,546	1546	1,546

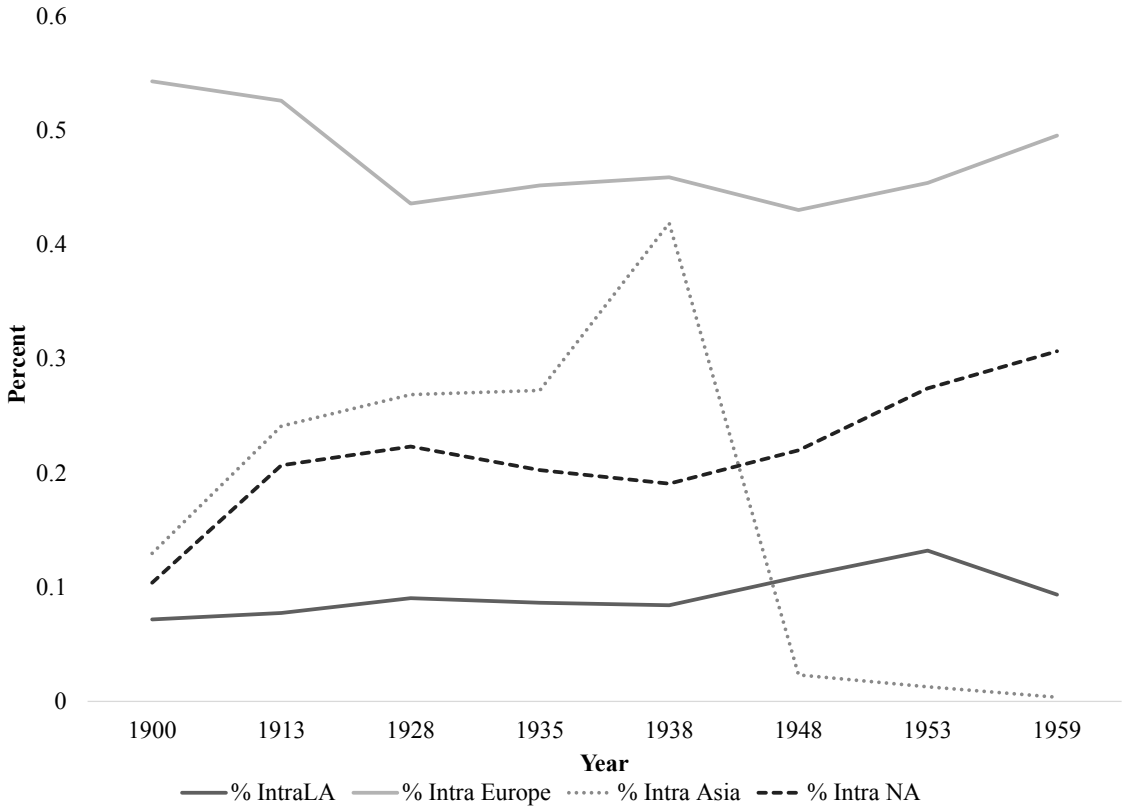
Notes: Dependent variable is the nominal exports of Argentina or imports to Argentina. Estimation is by Poisson PML. Source countries include five South American countries and 15 non-South American countries. Robust standard errors clustered by country pair are reported in brackets. Time dummies and world war period dummies are included but not reported. Time varying country fixed effects are included in column 2. *** p-value<0.01, ** p-value < 0.05, * p-value < 0.1

Table 6- Index of unit values for Brazilian exports of cotton fabrics (constant local currency prices 1970 = 100 per ton)

year	unit values	year	unit values
1915	1.305	1932	8.202
1916	1.498	1933	3.545
1917	1.945	1934	8.424
1918	3.230	1935	10.890
1919	3.622	1936	17.537
1920	5.985	1937	19.638
1921	4.449	1938	22.076
1922	4.545	1939	18.385
1923	8.934	1940	22.475
1924	10.602	1941	30.039
1925	9.890	1942	48.701
1926	13.263	1943	71.015
1927	10.073	1944	111.031
1928	8.633	1945	154.965
1929	8.742	1946	164.502
1930	8.345	1947	304.172
1931	7.581		

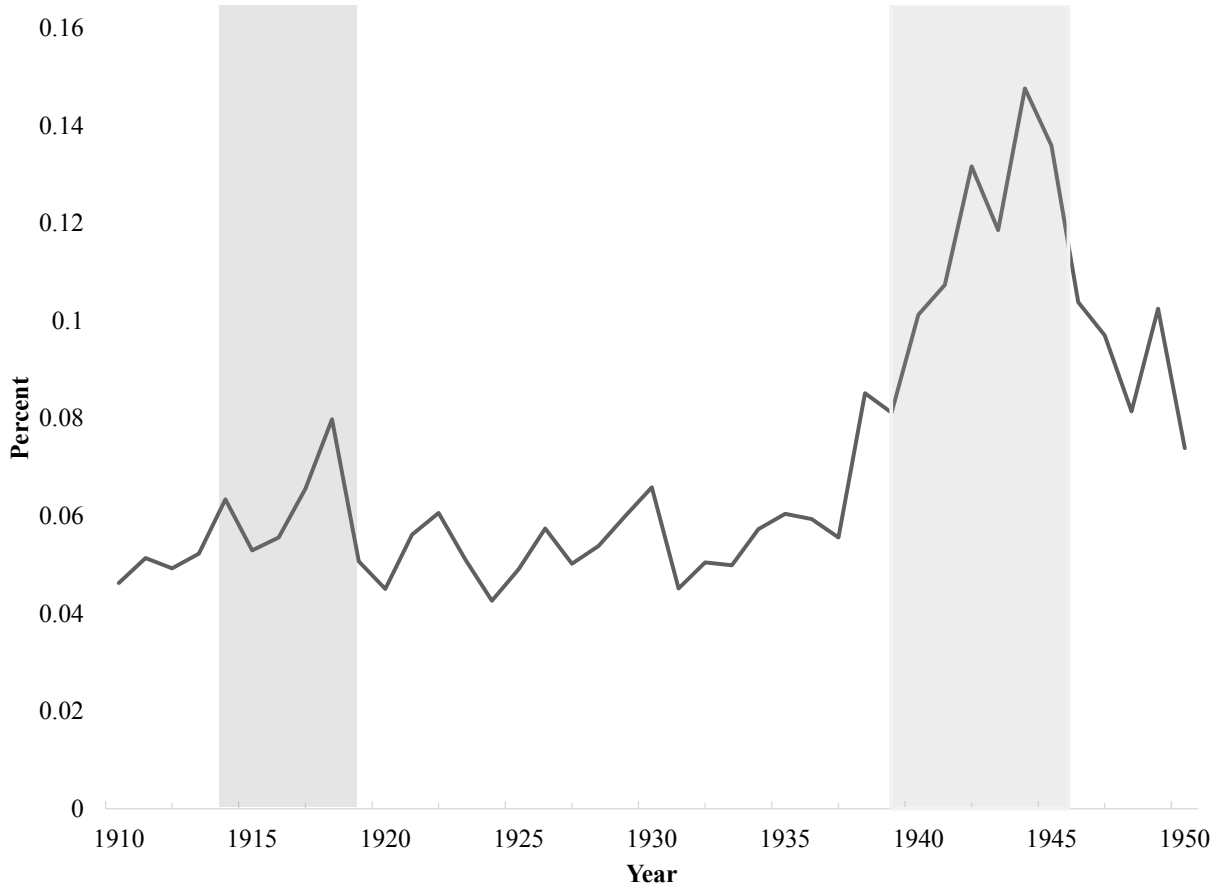
Source: Official Brazilian trade statistics, various years

Figure 1 – Share of intra-regional trade in various regions, 1900-1959.



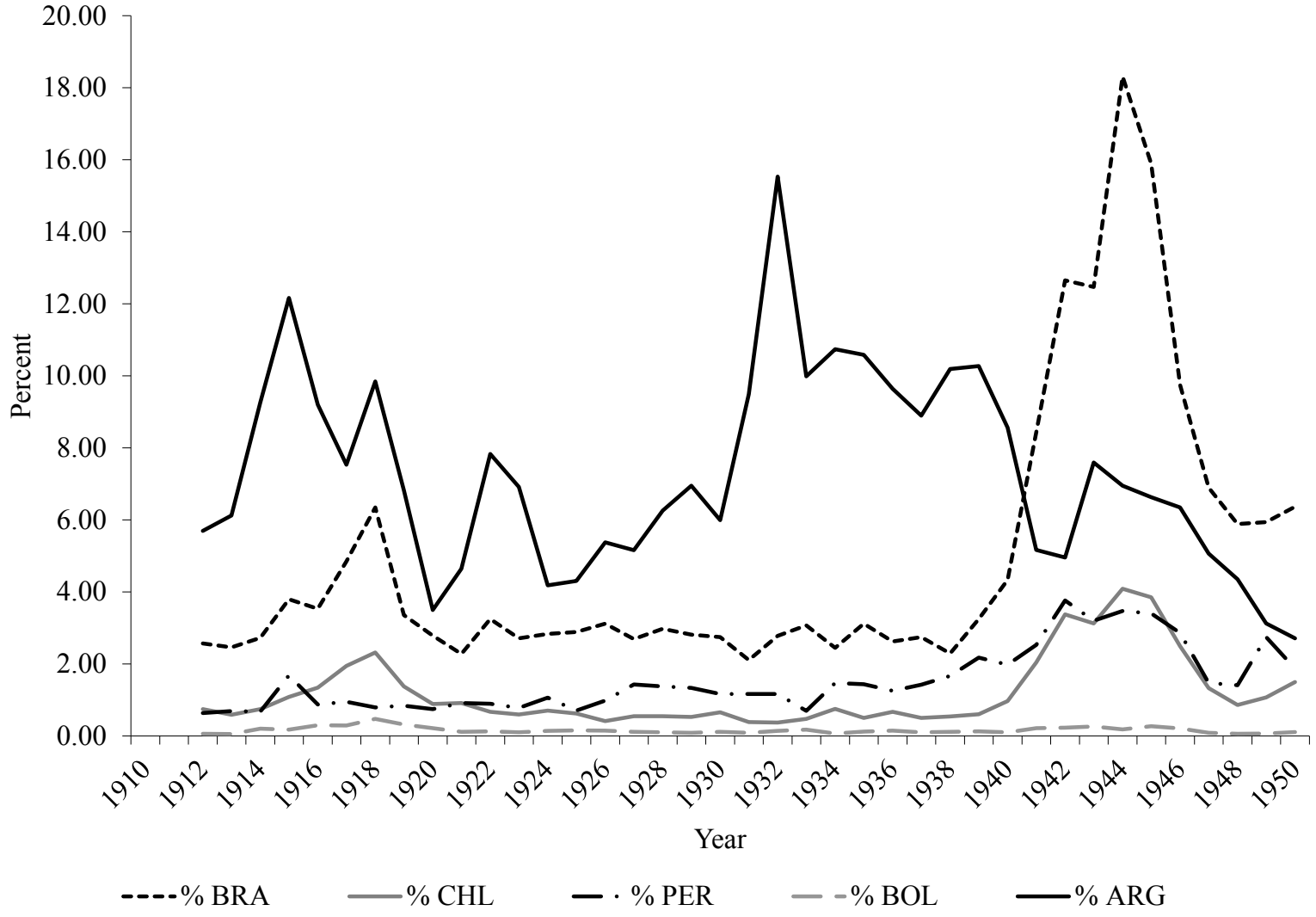
Notes: Source is United Nations (2009). Europe is western, continental Europe. North America is (Canada and US) and East Asia (China, Korea and Japan), 1900 – 1959.

Figure 2 – Exports to 5 South American Nations Relative to Total Exports for 5 South American Source Countries



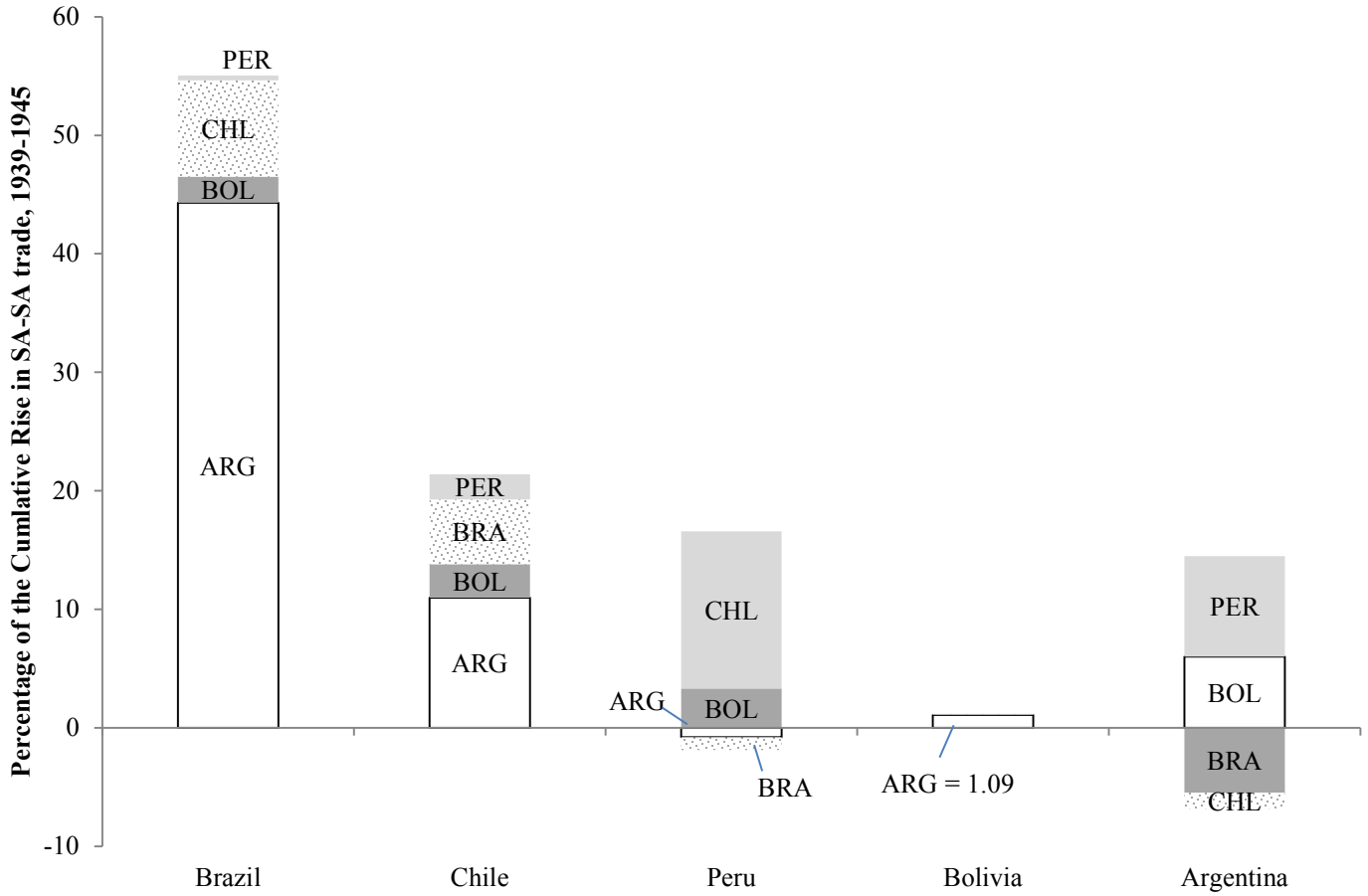
Source : Carreras-Marín et al. (2013). Shaded areas indicate world war periods, 1914-1919 and 1939-1945.

Figure 3 – Share of each country in total imports of other four countries, 1912-1950



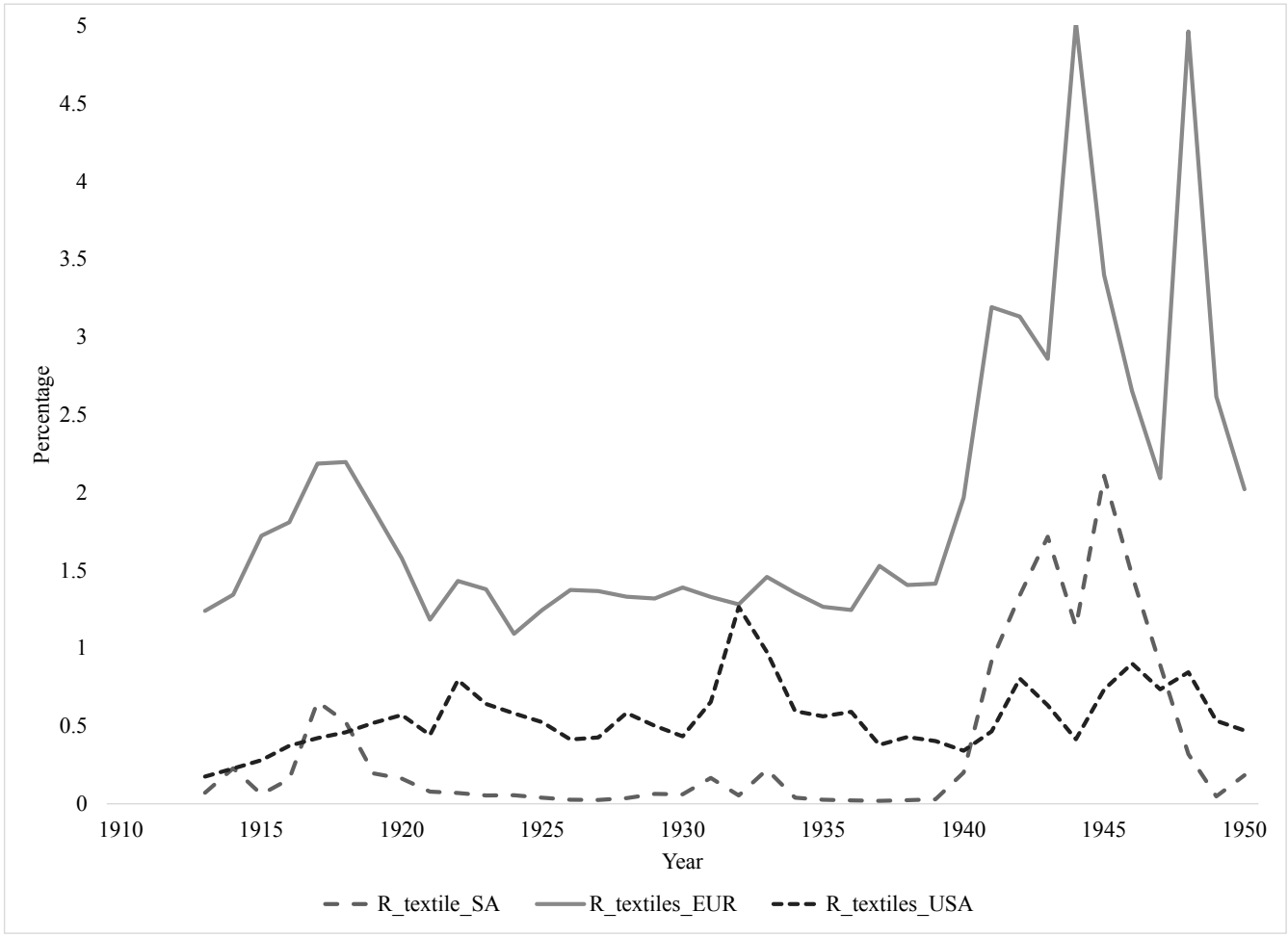
Source: Official Latin American Trade Statistics, various years.

Figure 4 – Shares of the total rise in South American exports to South American destinations by source and country destinations.



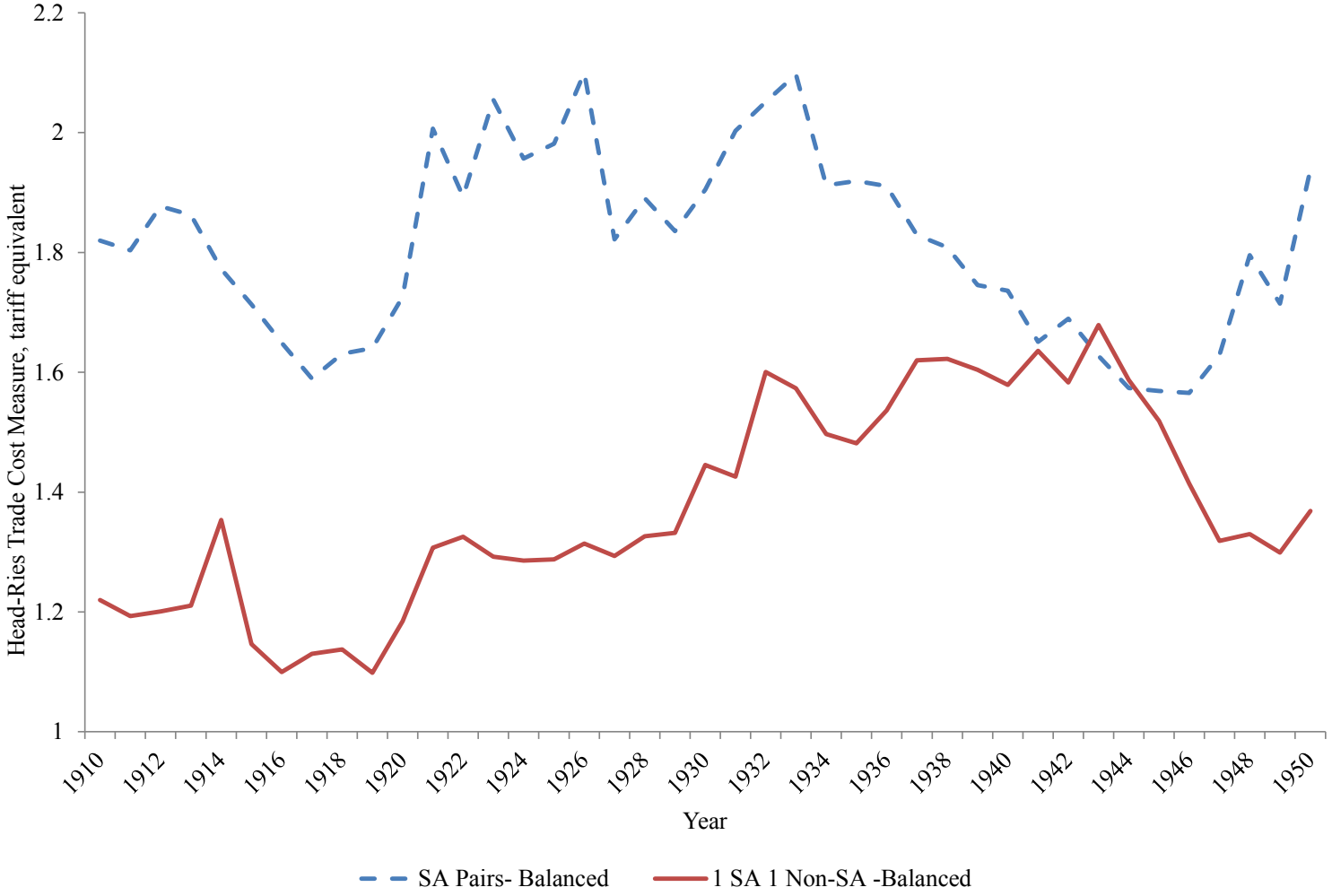
Notes: For each country we calculate the three-year average of total of exports centered on 1939 and 1945. We also calculate the three-year centered average of total exports from all five South American countires to the other four countries for 1945 and 1939.We calculate the percentage of the cumulative rise in SA-SA trade as the ratio of the former to the latter. This yields the height of each bar. Negative values indicate absolute declines in exports between two countries. Each country's bar is broken into four parts reflecting the proportion of the total change in intra-SA trade accounted for by exports to a particular country from a given source on the x-axis. The large white bar for Argentina (ARG) in the column for Brazil suggests that 44 percent of the total rise in intra-South American trade between 1939 and 1945 is accounted for by the rise of exports from Brazil to Argentina. Source for trade data include official Latin American trade statistics, various years.

Figure 5 – Regional trade intensity for importation Chile in textile goods



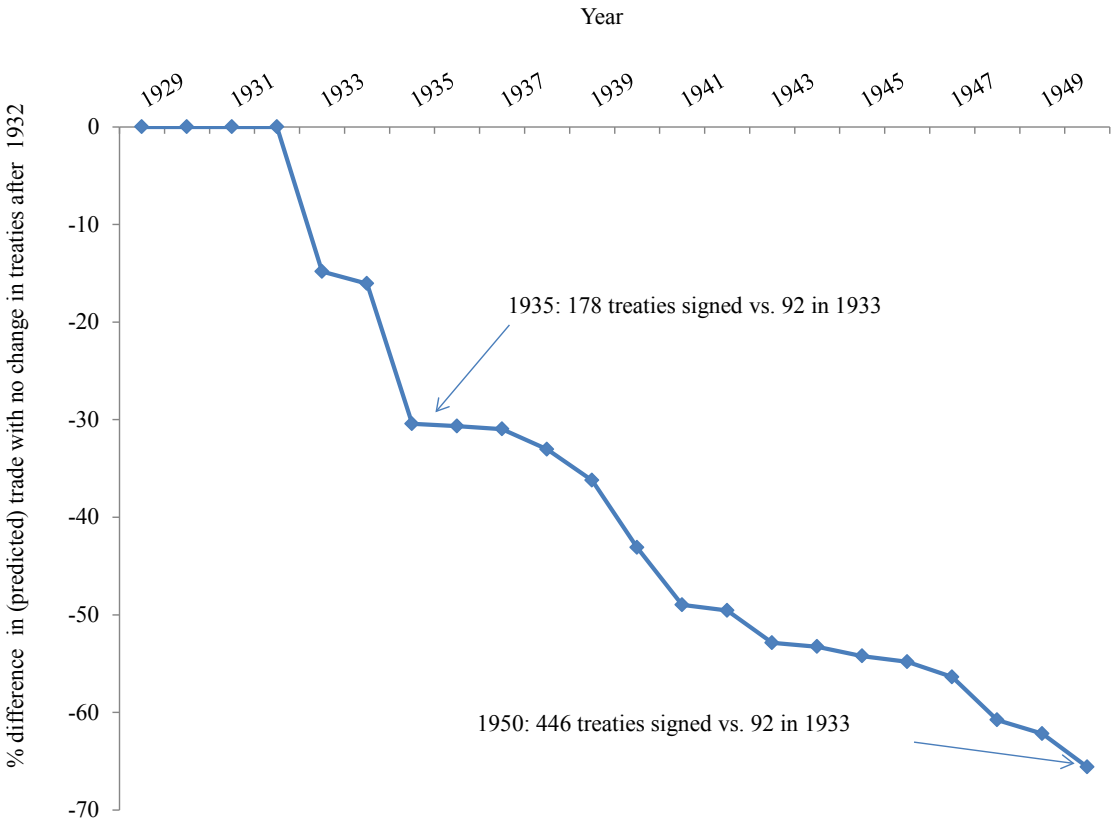
Notes: Regional trade indicator is defined as the share of Chilean imports in a particular industry from a given region (South America-SA, Europe-EUR, and USA) in total imports of that industry to the share of total Chilean imports coming from that region. Source: Official Latin American Trade Statistics, various years.

Figure 6 - Average Trade Costs for South American Country Pairs and South American/Non South American Major Trade Partners, 1910-1950



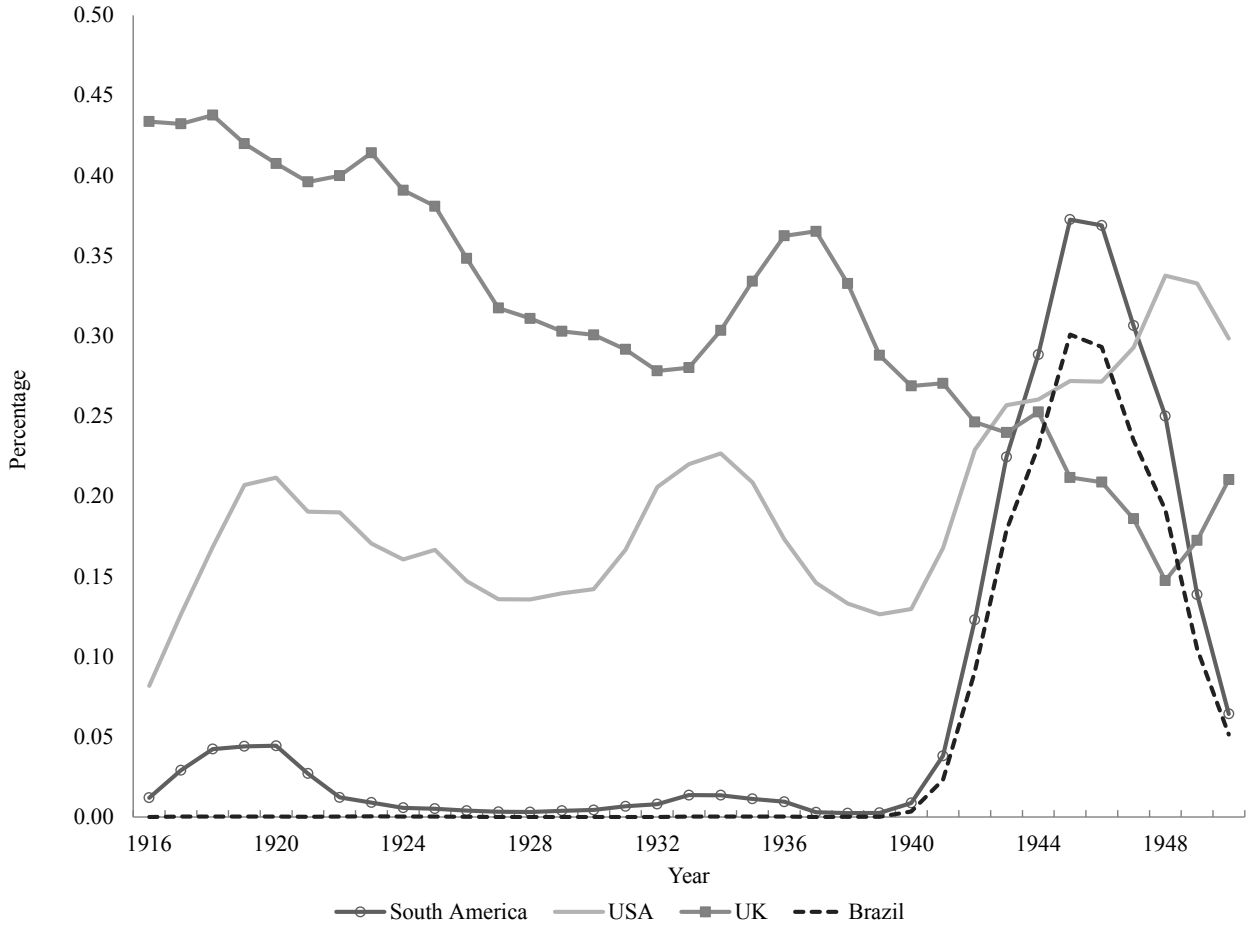
Notes: Trade costs are calculated as in (Jacks et al., 2011). Trade costs are not defined when trade flows equal zero. We therefore include only data from a balanced sample of country pairs. Countries in South America include Argentina, Bolivia, Brazil, Chile, and Peru. Other countries are USA, UK, Germany, France, Japan, Spain, and Italy.

Figure 7 – Counterfactual trade for Argentina, 1929-1950



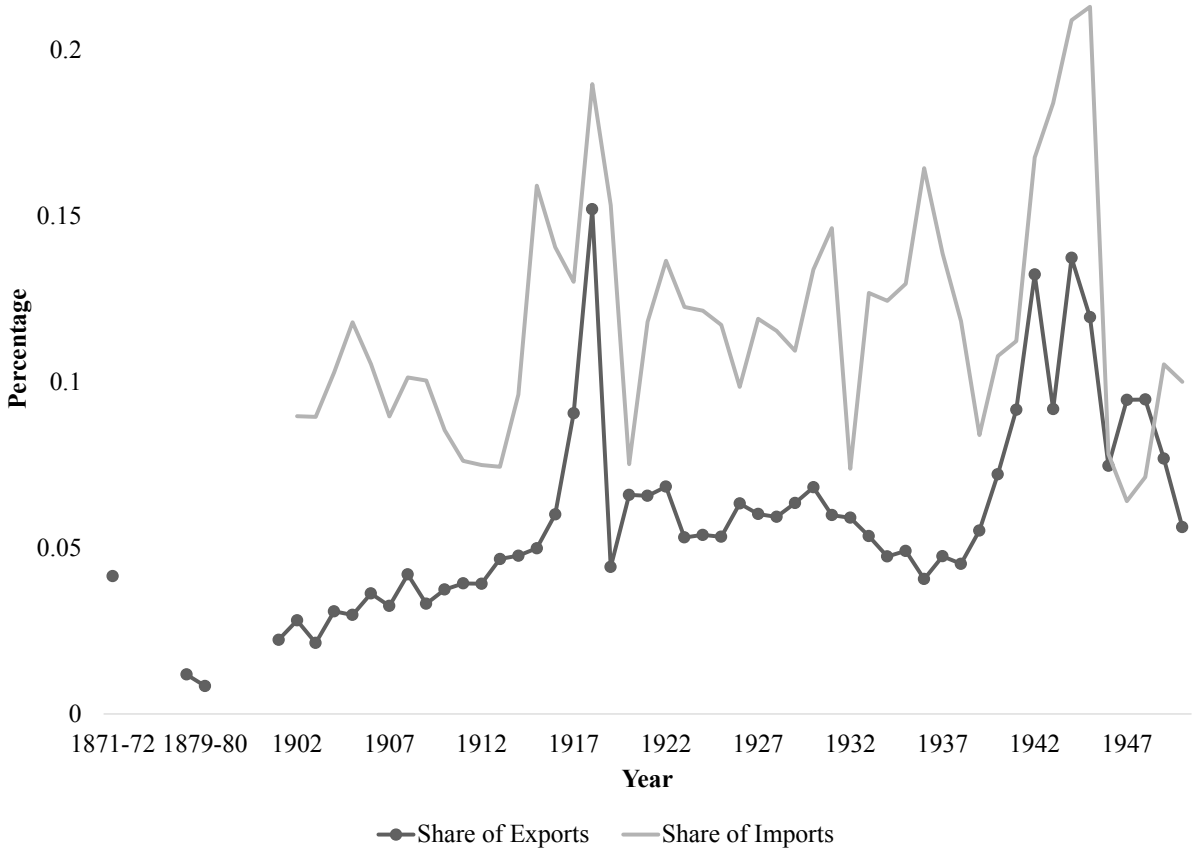
Notes: Figures represent the difference between actual trade and predicted levels of trade for Argentina if the number of treaties with each trade partner had been held constant at its 1933 value. Predicted values come from the gravity model presented in Table 5.

Figure 8 Chilean textile import shares by source, 1916-1950



Notes: Figures are three-year moving averages. Underlying data begin in 1913. Brazil is included in South American trade and then reported separately.
Sources: Trade Statistical abstracts for various years.

Figure 9 - Share of Argentina in Brazilian trade, 1871-1950



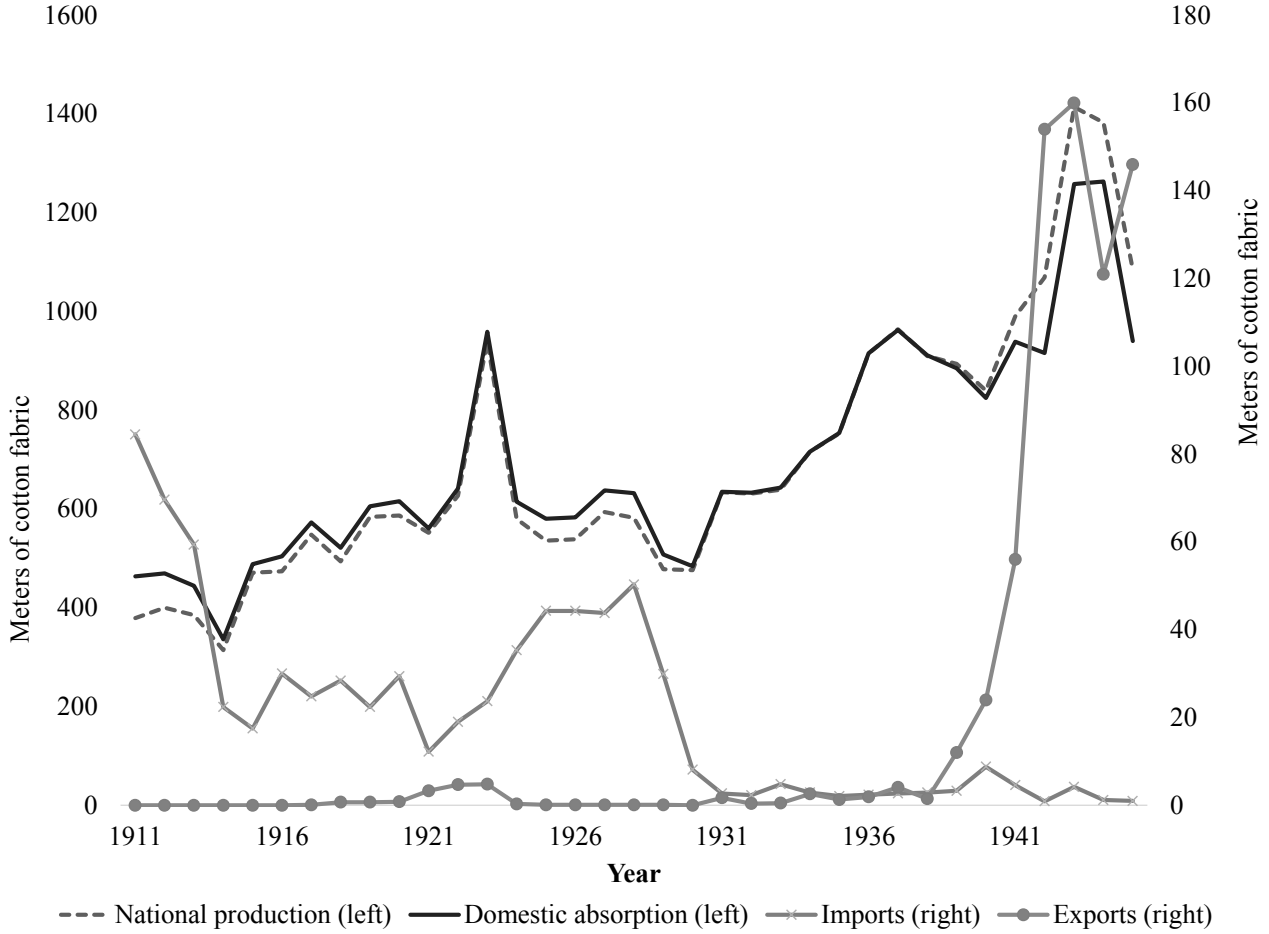
Source: Figures represent the share of Brazil's exports to Argentina as a share of total Brazilian exports and Brazils' imports from Argentina as a share of total Brazilian imports. Foreign trade statistical abstracts. Various years.

Figure 10 – Share of Brazilian Exports to Argentina, 1901-1950 for Two Main Products



Source: Foreign trade statistical abstracts. Various years.

Figure 11 Industrial textile production, domestic absorption, exports, and imports for Brazil, 1910-1950



Source: Vilella & Suzigan (1973). Domestic absorption is defined as total domestic production + imports – exports.

Figure 12 Logarithm of Textile Imports and Exports, Brazil (constant prices).



Sources: "Comércio Exterior. Exportaçao de manufacturas, 1939-40" Ministério da Fazenda. Tesouro Nacional. Serviço de Estadística economica e financiera. Imprensa Nacional. Rio de Janeiro. 1941. "Comércio Exterior do Brasil, por países, segundo as mercadorias. Vol. IV. 1945-46" Ministério da Fazenda. Tesouro Nacional. Serviço de Estadística economica e financiera. Imprensa Nacional. Rio de Janeiro. 1950. "Comércio Exterior do Brasil. Vol. II. 1941-42" Ministério da Fazenda. Tesouro Nacional. Serviço de Estadística economica e financiera. Imprensa Nacional. Rio de Janeiro. 1947. "Connercio Exterior do Brasil" Departamento Nacional de Estatistica. Ministerio do Trabalho, Industria e Commercio. Annos 1924-1925-1926-1927-1928. Rio de Janeiro. 1931. "A indústria Textil do Algodao e da La" Ministerio do Trabalho Industria e Comercio. 1949. Editado pela CETex.