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 natural and policy barriers to trade. Focusing on the latter explanations, 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, or was trade low for other reasons? We study bilateral trade between 1910 and 1950, when large external shocks altered global supply and demand. These shocks help us show that intra-regional trade could have been boosted with reductions in trade costs. South American regional trade could have benefitted from more benign trade policy or better infrastructure. Regional trade in textiles, which took off from the 1930s, supports our argument that trade improved when trade costs fell.

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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. Low levels of per capita income could also be a factor if richer countries are more likely to engage in intra-industry trade. 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 economic 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 of regional policy makers and economists from the 1920s was that international integration and industrial development were antithetical. This belief drove policy in South America for decades following Second World War. The question is whether consumers and the emerging domestic industrial bases alike of Argentina, Brazil, Chile, and other

countries in the region could have benefitted not only from increased production for the domestic market but from trade with neighboring countries. If so, then broadening the market could have been the "hand maidens" of greater regional prosperity. To answer this question it is necessary to know whether reductions in trade costs say via less restrictive trade policies could have promoted trade or whether other structural forces on the supply or demand side kept trade down.

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.[2] 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 potential for generating greater regional trade in South America in the 1910-50 period via lower 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 shares. We then present information on regional trade costs as defined in Head and Ries.[3] This measure captures 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, and Novy 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-

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[2] Bértola and Ocampo, *Economic Development*; Bulmer-Thomas, *The Economic History*; and, recently, Pinilla and Aparicio, 'Navigation in troubled waters', extensively discussed the impact of ISI policies on primary sector.
[3] Head and Ries, 'Increasing returns'.

globalization with several sizeable shocks to the world economy.[4] 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 rose. In this context, the shocks of the world wars 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 capitalize on the gains from trade via greater international integration. We consider the war periods as 'natural experiments' that can help provide clues as to whether trade costs were an important driver of regional integration.

We focus on a difference-in differences specification in a gravity model of trade. We study the change in trade amongst a set of five South American trade partners relative to the changes in exports from those countries to non-South American partners and relative to changes in exports of a group of eight non-South American exporters. Using state-of-the-art empirical "structural gravity" methods, reviewed recently in Head and Mayer, we are able to control for supply and demand shocks and to isolate the impact of trade cost shocks on regional integration emanating from these wartime market disruptions.[5]

While we believe the war shocks lowered the *relative* costs of regional trade they may also have changed the demand and supply structure in global markets as nations mobilized for and engaged in war. European exports to international markets including South America dropped markedly during the wars although the US acted to fill the gap. With our methodology we are able to control for these changes. In identifying whether trade costs mattered for regional integration, we must note that these supply and demand changes, as opposed to trade costs, could be behind the observed rise in regional trade. A lack of competition from European imports might have allowed

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[4] Jacks, Meissner, and Novy, 'Trade costs' and Jacks, Meissner, and Novy, 'Trade booms'.
[5] Head and Mayer, 'Gravity Equations'.

regional producers, who typically produced at a higher cost or with lower quality, to satisfy regional demand. We control for these shocks. After this we are able to study how changes in trade costs might have the ability to transform trade patterns. As trade barriers declined in the region – especially from the late 1930s – trade responded positively. Higher trade costs with European partners during the wars associated with shocks to shipping lines and the complications of distributing goods into a warzone appear to have *diverted* trade into the region. The idea that trade costs mattered seems to be validated.

We also approach this issue with direct evidence on observable trade costs and with detailed information on international trade and production from 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 that were already being sold. This dynamic also reveals that trade costs, broadly defined, limited intra-regional trade in industrial goods.

Why then was regional trade not sustained after Second World War? Why did not the temporary shock have a long-lasting impact on trade patterns and sympathy for those advocating greater regional integration? High uncertainty about trade policy generated by domestic political considerations might have limited the investments necessary to win market share in regional markets. 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, empirical models based on modern 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 through this lens 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 today in the new economic geography literature. In what follows, we capitalize on modern econometric and economic methodology to assess whether regional trade had any prospect 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.

2.1   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 exports among Argentina, Bolivia, Brazil, Chile, and Peru (SA5) over total exports for these five countries. World War I brought an increase from around 5 percent to a maximum of almost eight percent in 1918. The global crisis of the 1930s produced a drop in regional exports from six percent in 1929, to a minimum of 4.6 percent in 1931, recovering to 6 percent in 1934. In 1938 regional trade experienced a jump upwards to 8.5 percent. But it was during the Second World War that regional trade significantly expanded, with the trade share increasing by over 50 percent to 13.5 percent by 1945. By way of comparison, for five continental exporters (Belgium, France, Germany, Italy and the Netherlands) the regional share was roughly 23 percent in 1930. Maizels reports a similar figure for total intra-European trade shares of 34 percent in 1929.[6]

[Figure 1 here]

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[6] Maizels, *Industrial growth*, p. 92.

[Figure 2 here]

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 in 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 percent in 1920 to a maximum of 15.5 percent in 1932. But from 1941 onwards Brazil clearly surpassed Argentina. In 1944 Brazil had a share over her surrounding markets of 18 percent, far from that of Argentina, which was less than seven percent. Peru and Chile were also fighting for a second position on regional markets. Both countries had a share of close to 4 percent in regional markets during Second World War. Finally, Bolivia never represented more than 0.3 percent. The surprising exception during this period is Argentina. Its regional trade share declined in the Second World War 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.[7]

[Figure 3 here]

While the regional trade boom during Second World War was heavily a Brazil/Argentina story, a significant proportion (45 percent) 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 (1939 and 1945) and then break these shares into the four possible destinations. Brazil accounts for 55 percent of the total rise in intra-South American exports. 80 percent of its own rise in exports to these South American partners is to Argentina alone. 45 percent of the entire rise in regional trade is thus 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.

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[7] Castillo, 'El Plan'. In Pinedo's plan, Argentina declared the intention of intensifying intraregional trade as a way to overcome dependence on Europe.

[Figure 4 here]

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 percent of Argentinian exports to Bolivia in 1943, 33 percent to Chile in 1941, 44 percent to Peru in 1943 and 31 percent to Brazil in 1946. Brazilian exports of manufactures to Argentina in 1945 reached 43 percent of all exports. Moreover, the weight of manufactures in regional trade for Chilean imports increased from 6.7 percent in 1936 to 35.7 percent in 1943. Clearly this was a significant increase over historical trade patterns whereby these nations previously 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 for textiles from four regions (South American, Europe, UK and USA) in total imports of that industry to the share of total Chilean imports coming from that region. It is clear that regional integration was low in textiles, but near the end of World War II by this measure regional integration almost surpassed that with USA and Continental Europe, although it never reached the levels observed for the UK. 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.

[Figure 5 here]

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 six trade partners in Europe (Belgium, France, Germany, Italy, Spain, and the UK), Japan, and the US.

[Figure 6 here]

The trade costs measure is inversely related to the share of bilateral trade in total expenditure on domestic output. This approach to trade integration has been studied by Jacks, Meissner, and Novy. It is closely related to the measure developed in Head and Ries (2001) who studied a Krugman model of trade with monopolistic competition and a love of variety.[8] After controlling for economic size (as usual a function of the endowment of factors of production as well as total factors productivity), the South American countries in our sample seemed to face high barriers to trade in the region. Despite the fact that South American nations are on average half the distance from their European trade partners, trade costs were roughly 30 percent higher on average than with European trade partners. The narrowing that is visible from the 1930s suggests that major economic shocks, especially World War II, may have facilitated trade in South America.

This narrowing has many potential explanations. The most straightforward possibility would be that the cost of regional trade fell during World War II. 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 studied here can also fall when it becomes *relatively* easy to trade such that trade is "diverted" into the region whether "away" 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 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

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[8] Jacks, Meissner, and Novy, 'Trade costs'; Jacks, Meissner, and Novy, 'Trade booms', Head and Ries, 'Increasing returns'. 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 'Trade booms'. 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, Meissner, and Novy, 'Trade booms'.

plausible, might be an increased difficulty of trading domestically which would spur international trade. Also a rise in the elasticity of substitution, or lower markups, could give rise to greater integration 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 latter force is an interesting possibility, we have no reason to believe that the preference structure and the industrial organization changed so dramatically over such a short time.

There are multiple other potential explanations for the generally poor progress of regional trade prior to 1950. One common argument is that South American nations lacked technological complementarity, perhaps because of too great 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, since the Head-Reis measure is consistent with a simple Armington assumption that identifies goods with their origin. Moreover, in terms of industrial goods, models based on a "love of variety", would also predict regional trade in proportion to economic size. The best possible explanation for low regional integration under such an assumption seems to be high trade costs.

Yet another possible explanation is that European producers supplied high quality goods eliminating South-American trade in industrial goods. This is plausible but we unfortunately have no good way of measuring quality per se given the available data. It is worthwhile noting that the

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trade costs measure is based on two-way trade. If trade costs are high it is because imports and exports alike are low. Low quality would have dissuaded foreign consumers *anywhere* in the world from purchasing South American exports. Instead we see that after controlling for the size of supply and demand, the South American nations in our sample had a relatively difficult time gaining market share close to home but not abroad.[9]

2.2   The drivers of regional trade through an econometric gravity approach

In this section we explore the determinants of South American regional trade and trade costs with the help of a novel data set on bilateral trade for five South American countries with eight European and North American trade partners between 1910 and 1950.[10] We use a structural gravity model of trade which itself is consistent with many different modern models of international trade. The structural gravity model attempts to explain the variance in the level of bilateral exports 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 for some country pairs implying infinite variable trade costs or at least significant fixed costs of trade at the bilateral level. Instead, our gravity models do not ignore zero

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[9] 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 import consumer goods from European countries and US.

[10] The countries are Argentina, Brazil, Bolivia, Chile, and Peru. Outside of South America we have the US, UK, Belgium, Germany, Italy, Spain, France, and Japan, which were the main trade partners for South American countries. Our dataset relies in Carreras-Marín, Badia-Miró, and Peres Cajías, 'Intraregional Trade', expanded with new trade figures for South American trade with Japan, Spain, Belgium and Italy (its main trade partners). We have considered South American official sources which include trade data during the wars. That is an important novelty as many international trade data sets are simply composed by zeros for the periods during the wars. Although we also have some inevitable zeros with countries like for instance Germany, we have been able to fill more data for other countries during the conflict years. We have always taken into consideration the arguments given by recent literature on the accuracy of South American official trade statistics. Carreras-Marin and Rayes, 'La fiabilidad'; Tena and Willebald, 'On the Accuracy'; Carreras-Marin and Badia-Miró, 'La fiabilidad'; Federico and Tena, 'On the accuracy'. For trade among European countries and the US we have considered Jacks, Meissner, and Novy, 'Trade booms'.

observations. We use the Poisson pseudo-maximum likelihood (PML) estimator as suggested by Santos Silva and Tenreyro and Head and Mayer.[11]

Our baseline estimating equation is:

$$x_{sdt} = \exp[\beta_1(SA_{sd}) + \beta_2(SA_{sd} \cdot WAR_I) + \beta_3(SA_{sd} \cdot WAR_{II}) + +X'_{sdt}\Theta + s_{dt} + d_{dt}] + \epsilon_{sdt}$$

where, *SA*, is an indicator equal to one if both countries in the pair are located in South America, *WAR* is an indicator for the periods comprising either World War I (1914-1918) or World War II (1939-1945), 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, and an indicator equal to one if both countries are on the gold standard. The last set of variables includes period specific exporter (*s*) and importer (*d*) dummies which control both for economic size as well as what Anderson and van Wincoop called 'multilateral resistance'.[12] We omit the importer indicators for one country since the full set of indicators is not full rank. We also note that time dummies are subsumed by the year-specific constant/exporter reference country along with the country-time interactions. These fixed effects control for factors that shape trade with all trade partners relative to the dyad in question as well as productivity and demand shocks affecting trade and production for both the producer and consumer country. Finally we also include a pair-specific error term.

Regressions of this form will allow a difference in difference interpretation of the impact of trade cost changes during and due to the World Wars. In particular our gravity equation can be used to study two hypotheses:

1. β_1 allows us to know whether after controlling for geography, other observable trade costs, economic size and productivity, Latin American nations export less to each other. If this

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[11] Santos Silva and Tenreyro, 'The Log', and Head and Mayer, *Gravity Equations*.
[12] Anderson and van Wincoop, 'Gravity with Gravitas'.

coefficient is negative and statistically significant, it is consistent with high regional trade costs in South America.

2. Next, we would like to know whether a decline in trade costs allows South American countries to trade more. Since trade costs changes are endogenous, we focus on the wartime shocks to isolate an exogenous shock to such costs. Specifically β_2 and β_3 are the difference-in-differences coefficients of interest. They measure the rise in intra-South American trade during the wars relative to both non-South American destinations and non-South American exports to all destinations in our sample. We use the World Wars as a natural experiment. These shocks are not obviously contemporaneously associated or caused by shocks to South American productivity, supply or demand. Moreover, trade policy and other trade costs in South American nations did not react directly and concurrently to the shock of the wars. Instead we rely on a global shock that changed the relative costs of engaging in international trade. Finally we assume that in the absence of the shock trade patterns for South American pair countries and non-South American pairs would have evolved (conditional on observables) in a similar way.

It is useful to rely on structural gravity. While regional trade shares seem to rise during the wars, as seen above, it is impossible to know whether this is because South American nations became relatively more competitive as foreign suppliers went offline etc. or whether the *relative* cost of regional trade fell. However, we can discriminate between these forces with the structure of the gravity model.

In this empirical model, the time-varying importer and exporter fixed effects control for supply and demand shocks that could affect international trade levels across all partners. For instance, if nations became more competitive, or if demand falls across all partners the demand system being requires trade to rise equally across all partners conditional on other observables.

If the coefficients on the interaction terms on South America and the wars are insignificant *after* including these controls for supply and demand, then we can argue that the rise in trade shares during the wars is very likely attributable to changes in competitiveness, supply, demand or trade

diversion. 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 output prices.

Assume instead that we find the coefficient on the interaction between the South American indicator and the war dummies to be positive and significant, *even after including time-varying country 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. Such a finding would validate the proposals of various policy player in the early twentieth century including the Pan-American Union and Federico Pinedo, finance minister of Argentina, who lobbied extensively but unsuccessfully for a regional free-trade area in the late 1930s and the early 1940s.

2.3   Gravity: Baseline Results

Error! Reference source not found. Table 1 investigates the results of our 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 and country pairs with no South American country. We present various specifications including a sub-sample for the years 1910-8 (column 1), 1935-45 (column 2), and the entire sample 1910-50 (column 3). In columns 4 and 5 we include controls for other periods as placebos and to control for pre-existing trends.

[Table 1 here]

The first row of Table 1 shows that, in all specifications and after controlling for a number of other determinants, the South American countries in our sample exported less to each other. In column 1 this decrease is about 77 percent while in column 2 it is 88 percent and in column 3 it is valued at 74 percent. Columns 1, 2, and 3 show evidence consistent with the idea that during both wars trade costs between the South American countries in our sample fell causing trade to be higher in the region. All coefficients on the interaction terms of wars and South America are statistically significant. Our point estimates suggest that during the wars trade rose faster amongst South

American partners than by pairs with one or less South American country by an average of about 80 percent. All regressions control for supply, demand and trade diversion effects. Therefore we find strong evidence that the higher trade shares witnessed during the wars appear to have been driven by declines in regional trade costs. These declines should be interpreted as relative declines in trade costs given.

2.4 Gravity: Robustness and Sensitivity

We proceed with a number of robustness checks. Columns 4 and 5 of Table 1 check whether trade was abnormally high between South American pairs during the 1920s (1922-9) or the Great Depression (1929-38). We do not expect trade to be abnormally high or low in the 1920s, so we include this indicator in the spirit of a placebo test. Inspection of the trade shares in the 1930s reveals a potential rise in regional trade from the mid-1930s. We worry about a South American pre-trend here. In neither case are the coefficients on these terms significant.

We explore pre-existing trends further in Table 2. Here we include an interaction between South American country pairs and a simple linear time trend (i.e., the sample year minus 1909). Both time trends are positive and significant in the 1910-18 and 1935-45 sub-samples. Still, our wartime shocks are associated with significant coefficients. In column 1, the First World War is associated with higher trade in South America, though the point estimate is smaller than in Table 1 (0.49 vs. 0.72). In column 2, the pre-Second World War and Second World War sub-sample, the coefficient of interest on the interaction terms is no longer significant. In column 3 of Table 2, which includes all years, 1910-50, the coefficient on the Second World War/South American interaction is significant again and of nearly the same magnitude as in column 3 of Table 1.

[Table 2 here]

In Table 3 we continue analysis with different comparison groups. Columns 1-3 use the US as the only other exporter in the sample besides the five South American countries. The rationale for dropping the other mostly European exporters is that they were territorially embroiled in the

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wars. Comparing South American export success to the US is a more punishing test since continental European trade would be low during the wars. In columns 4-6, we use the UK as the comparison country. While the UK was potentially more directly exposed to both wars, it is a natural comparison country since outside of wartime it was a leading exporter to South America. In columns 7-9, we use the US and UK together as the only other comparison exporters. We split the samples over time as above and present results for 1910-50 as well. In nearly all cases our results are qualitatively similar to those from Table 1. The exceptions are when we use the UK as the only comparison country and look at the entire time period or the 1935-45 period. Here it appears that South American exports did not grow much faster than exports to the UK during the Second World War--even after controlling for supply and demand shocks. Special shipping and war-time supply lines aimed at supplying the allied war effort, thereby lowering trade costs, may help explain this result. Overall, Tables 1 through 3 suggest that trade costs played a role in determining the level of South American integration.[13]

[Table 3 here]

3.1 Accounting for Trade Growth

We can also decompose the changes in (total) bilateral trade amongst dyads in a sample restricted to South America. A trade decomposition allows us to assess the relative importance of trade costs versus supply, demand and third market effects in explaining regional changes in trade. One drawback here is that zero trade flows cannot be used. Following Jacks, Meissner, and Novy, the log point change in trade for a dyad is given as:[14]

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

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[13] Results in Table 1 column 3 are qualitatively robust to omitting the dyads that include both Brazil and Argentina. Our results do not rely solely on this important pair of countries whose leaders attempted closer trade relations in the late 1930s and early 1940s.
[14] Jacks, Meissner, and Novy, 'Trade booms'.

where $\theta_{st} = y_{st}/(y_{st} + y_{dt})$ is the country *s* share of pair GDP, Δ denotes that we take differences between period *t* and 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 arising from higher inputs or greater productivity (the first term), similarity in size of GDP (the second term), trade costs (the third term) and multilateral effects (the fourth term) 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 of the decomposition equation for all observations of the 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 First World War and almost nothing during the Second World War. Similarity in economic size is also a minor player. Trade costs (which are falling) play a larger role in the Second World War period (53 percent) than in First World War. Consequently the change in output explains a greater proportion of the rise in trade amongst our South American countries in the First World War period.

[Table 4 here]

We interpret these findings as evidence supporting the idea that wartime disruptions to global markets made bilateral trade within South America relatively less costly and significantly so. Trade costs mattered for regional integration. Second, boosting output by raising productivity could also have contributed substantially to intra-South American trade. This finding holds constant what is happening in world markets. The decomposition suggests a role for competitiveness in boosting regional trade as well. 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 multilateral effects to have been important, exports to all partners would have had to change faster than total output. While South Americans gained market share with some partners, trade plummeted in others—especially in Europe. The structure 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 rather than third market effects. Given the generality of the demand system, these results are likely to be fairly robust.

4.1 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 in Brazil were fraught. Brazil's coastal shipping laws eliminated international competition and led to slow internal communications.[15] In 1910 freight rates per ton of cotton goods via the English-flagged Booth Lines or the Lloyd Brazileiro were quoted as follows: Liverpool-Belem (Para) (4,290 miles) $12.76; New York-Belem (3,380 miles) $14.52; Rio de Janeiro-Belem (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 miles) $34.16.[16] 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

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[15] Graham Clark, 'Cotton Goods'.
[16] Graham Clark, 'Cotton Goods'. Clark refers to the port of Para which is Belem.

this raised rates even more.[17] 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.

The small level of regional trade is evidence in Brazilian trade statistics from 1903,[18] slightly before our period. These data 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 logarithm of shipping 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.[19]

Although intra-South American freight rates might have been high, the world wars changed relative freight rates dramatically. The US Bureau of Foreign Commerce studied shipping at the outbreak of World War II 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 in South America rose 20 percent from autumn 1939 to May 1940 while tramp freights for coal (on non-US and non-Brazilian flagged vessels) from Europe rose

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[17] Sanderson, 'Wartime control', 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.
[18] Servicio de Estatistica Comercial, p. 223.
[19] 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.

260 percent.[20] The rise in freight rates on automobiles (boxed) between July 1939 and April 1940 from US Atlantic ports to Antwerp was 706 percent. Between US Atlantic ports and Rio it was 22 percent. On tobacco for the same routes the rises were 329 percent vs. 12 percent. For Le Havre the increases were 158 percent (automobiles) and 185 percent (tobacco); for London the rises were 150 percent (automobiles) and 200 percent (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 percent while those to Buenos Aires had risen only 11 percent. Clearly, relative freight costs had risen much more on European-South American and American-European routes than on US-South American routes and regional routes.

Quantity rationing in shipping also 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 percent to 400 percent. On the other hand, traffic between Peru and the US witnessed rate rises of 20 percent. Since the liners that served Peru from the US often served other nations like Chile and also the Rio de la Plata, 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 1910-50 period. Chile raised tariff rates on a host of industrial products beginning in the 1920s which depressed trade during peace-time. The onset of the Great Depression led quickly to the imposition of exchange controls in many countries which lasted throughout the rest of our sample. Brazil ordered exporters

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[20] Sanderson, 'Wartime control', p. 7.

to sell 30 percent 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.[21] Argentina and Chile also implemented exchange controls in the 1930s equally protective of domestic producers in selected industries.[22]

Contrary to these forces which suppressed South American trade, many attempts were made to improve trade relations in the 1930s and onwards. We explore whether these policy changes are associated with higher trade. To do so we have collected and digitized new data on commercial and diplomatic ties for Argentina and 19 of its trade partners for our sample years to illustrate the likely impact of such policies.[23] Our new variable includes a wide variety of diplomatic ties such as friendship agreements, trade facilities, regulations on migration, railway connections at the border, diplomatic post exchanges, and mutual recognition of professional training levels or cultural promotion.[24] The pace with which Argentina signed these treaties increased from the early mid-1930s with a much stronger rise with Latin American trade partners than with non-Latin American countries. To operationalize this variable 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 presents our results.

[Table 5 here]

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/Second World War 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 Second World War.

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[21] Bulmer-Thomas, The Economic History.
[22] For Chile see Diaz and Wagner, 'Política Comercial'.
[23] These are Belgium, Bolivia, Brazil, Canada, Chile, Denmark, France, Germany, Italy, Japan, Netherlands, Norway, Peru, Portugal, Spain, Sweden, Switzerland, UK, and the US.
[24] See Ministerio de Relaciones Exteriores y Culto, República Argentina.

These treaties may have been associated with closer trade relations and the higher 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 smaller.

[Figure 7 here]

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 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 years of leads and three years of lags for the cumulative treaty variable. If trade were higher in advance of the rise in the number of treaties, then we might suspect an upward 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 2. This suggests that trade was not exceptionally high (or growing) 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,

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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. At the same time, the fact that policy makers pursued closer integration so energetically is a signal that there was some faith in the idea that trade costs and trade policy mattered.

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

In this section, we continue our investigation of the drivers of regional trade by zooming in on the textile industry.[25] During the periods of global disruption like the wars, 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/or improved competitiveness.

During the wars, production and intra-regional trade in these goods expanded significantly. Figure 8 shows the shares for Chilean textile importation. Over the long-run, British goods followed a decreasing tendency (from 42 percent in 1913 to 11 percent in 1947) at the same time as the USA was increasing its share in the Chilean market (three percent in 1913 to 36 percent in 1946). Japan appeared as an important partner after the Great Depression, reaching one quarter of total imports in 1940, just before collapsing during the war. Our other South American countries increased their share during the First World War (one percent in 1913 to seven percent in 1918) but an even

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[25] 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 First World War. This might have left space for competition from regional producers. Brazil had the most sophisticated and largest textile industry in Latin America with a domestic textile industry ranked seventh in terms of production in 1918. Huberman, 'One World'.

stronger boom occurred in the 1940s (three percent in 1940 to 46 percent 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 UK-US dominance. And in fact, from the 1930s, both Argentina and Brazil competed for regional market share by signing bilateral treaties and also through ad hoc incentives embedded in their exchange controls 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.[26]

[Figure 8 here]

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 international markets.[27] During the World War II, 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. 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 part 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 according to Brazilian sources. During both wars, Brazil clearly increased its exports to the Argentinean market.

[Figure 9 here]

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[26] Huberman, 'One World'; Graham Clark, 'Cotton Goods'.
[27] Huberman, 'One World'.

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. During World War II, 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 were likely easily substitutable for foreign goods.

[Figure 10 here]

As an indication of competitiveness, Figure 11 shows some key indicators of the evolution of the textile industry in Brazil. In particular we are interested in the relationship between the share of output going to the domestic market, the share of output for export and the value of imports. Data are expressed in quantities (meters of cotton fabrics) for comparability. The left vertical axis shows data for industrial production and apparent consumption (domestic production – exports + imports). The right vertical axis shows trade data figures. The domestic market was 80 percent covered by domestic production during the entire period. Imports were around 15 percent before World War I falling to around five percent during the conflict. They remained more or less at that level during the 1920s. After the early 1930s, textile imports dropped, ultimately claiming an insignificant share of the domestic market. At the same time, evidence of significant declines in trade costs with major trading partners is visible. Brazilian textile exports began to grow strongly in this period with growth in meters exported outpacing growth in total production. In fact, while production in meters increased by about 70 percent between 1932 and 1945, exports rose 292 percent between 1932 and 1945. Between 1939 and 1945 the figures are 21 percent for production and a growth *factor* of 12 for exports. Textile exports were less than one percent of domestic production until 1939. By 1942 Brazil exported 14 percent of her domestic production half of those exports going to Argentina.[28]

[Figure 11 here]

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[28] A similar pattern is observed by Chile during the First World War and the 1920s. Most domestic production of textiles stagnated and imports' importance in total consumption remained stable (see Palma, *Growth and structure*.).

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 explains the textile performance of Brazil using that year as a breakpoint.[29] 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 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 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 by exporting goods not previously exported. The number of textile goods being exported to Argentina increased from one to six items during 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 percent), Uruguay (four percent) and the UK (two percent). 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. Moreover, 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

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[29] Huberman, 'One World'.

Argentina to Brazil would rise – at least fractionally. Instead any rise in the export share of these countries was concentrated on more traditional goods rather than in these new industries. In effect a new, regional division of labor seemed to appear during this period.

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.

[Table 6 here]

The remaining question is why after 1945 regional trade gave ground so quickly. First, trade routes were restored to normalcy and the barriers to trade that had reigned during the war fell back to more normal levels. Regional attempts at integration stalled, nations raised tariffs, and autarkic policies were on the rise despite ECLA's claims about how regional integration could achieve economies of scale for industrialization.

Weaknesses in Latin American industrialization have also 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 also argues for 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 increasingly relied as much on protectionism, import restraints and public subsidies as it did on export markets. The consequences for regional trade were negative. Bértola and Ocampo argue that high macroeconomic volatility and insufficient domestic demand also had negative effects on Latin American industrialization.[30]

6. Conclusions

Viewed from a long run perspective, greater regional trade in Latin America seems to be Sisyphean. Its historical trajectory is currently part of many international debates on the merits of regional trade. Liberalization efforts since the 1990s have not been sufficient to promote strong regional integration. In 2000 the share of total imports for Argentina, Brazil, Chile and Uruguay coming from these same countries equaled 18 percent (World Trade Organization and UNCTAD) 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 percent with a maximum of 24.5 percent in 1944.[31] 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.[32] Such proposals are founded on the idea that regional trade is possible.

Our results affirm this and show that trade costs matter. 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.[33] In this paper we explore the drivers behind this phenomenon. 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

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[30] Bulmer-Thomas, *The Economic History*; Bértola and Ocampo, *Economic Development*.
[31] World Trade Organization and UNCTAD, 2012, p. 28.
[32] Mesquita Moreira, Volpe, Blyde, and Martincus Volpe, *Unclogging the Arteries*.
[33] Carreras-Marín, Badia-Miró, and Peres Cajías, 'Intraregional Trade'.

more distant partners, but that during the wars these fell. This was because of concerted efforts 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 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 near neighbors. Nevertheless this increase was not persistent. Once the war was over, 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 full-fledged customs union. Without these incentives, the necessary investments required to establish export links to these markets was not made. Without lower trade costs, the entry of firms producing new products that could compete with extra-regional substitutes was limited. Again, relative trade costs 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 produced successful productivity growth.

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Figure 1 – Share of intra-regional trade in various regions, 1900-1959.
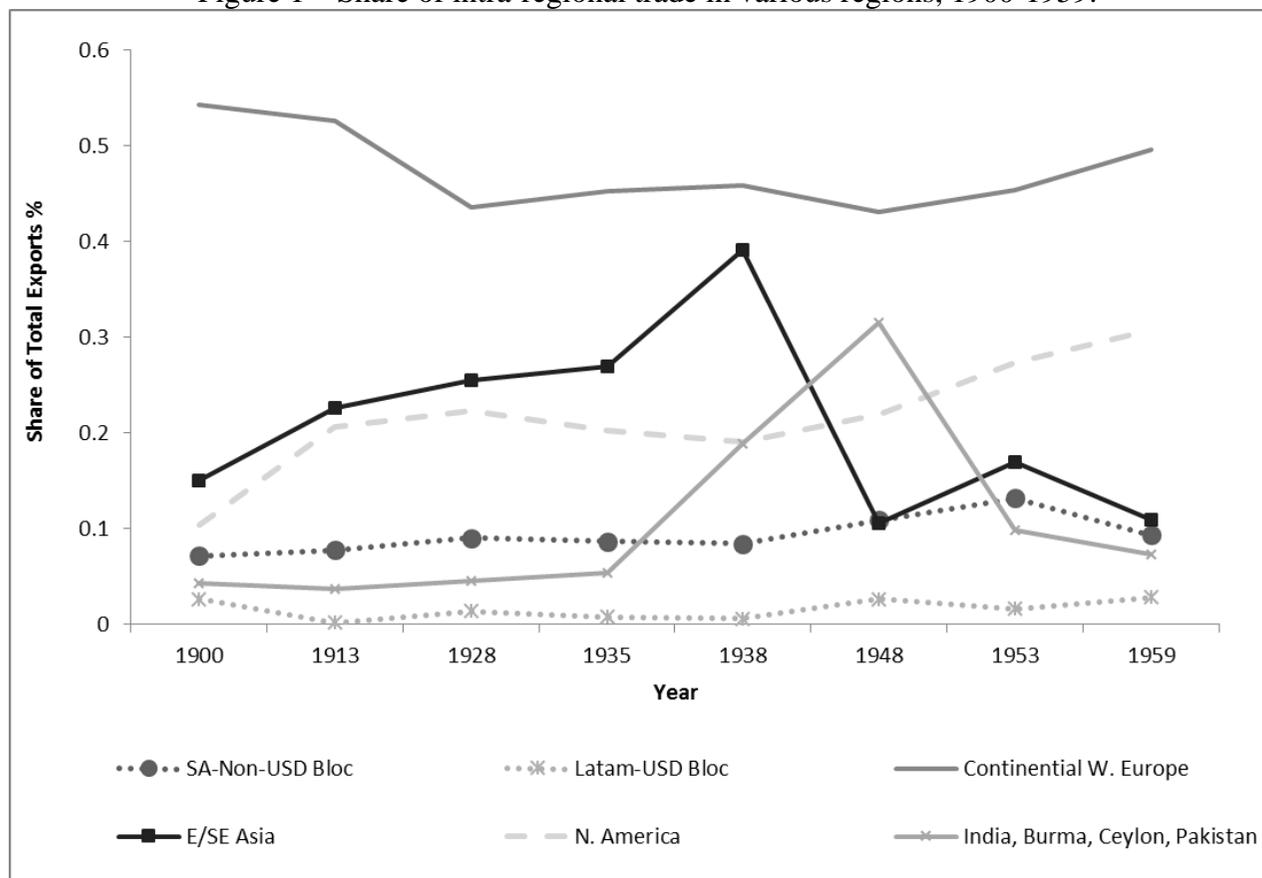
Notes: Source is United Nations, *International Trade Statistics*. SA-Non-USD bloc: Argentina, Brazil, Chile, Paraguay, Peru and Uruguay. Latam-USD Bloc: Bolivia, Columbia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Venezuela and Virgin Islands. Continental Europe: Austria, Belgium –Luxembourg, Denmark, France, Germany (beginning 1948 data for the Federal Republic), Greece, Italy, Netherlands, Norway, Portugal, Sweden, Switzerland and Turkey. E/SE Asia: China, Japan, Afghanistan, Taiwan, Korea, Philippines, Ryukyu Islands and Thailand. N. America: United States and Canada.

Figure 2 – Exports to 5 South American Nations Relative to Total Exports for 5 South American Source Countries
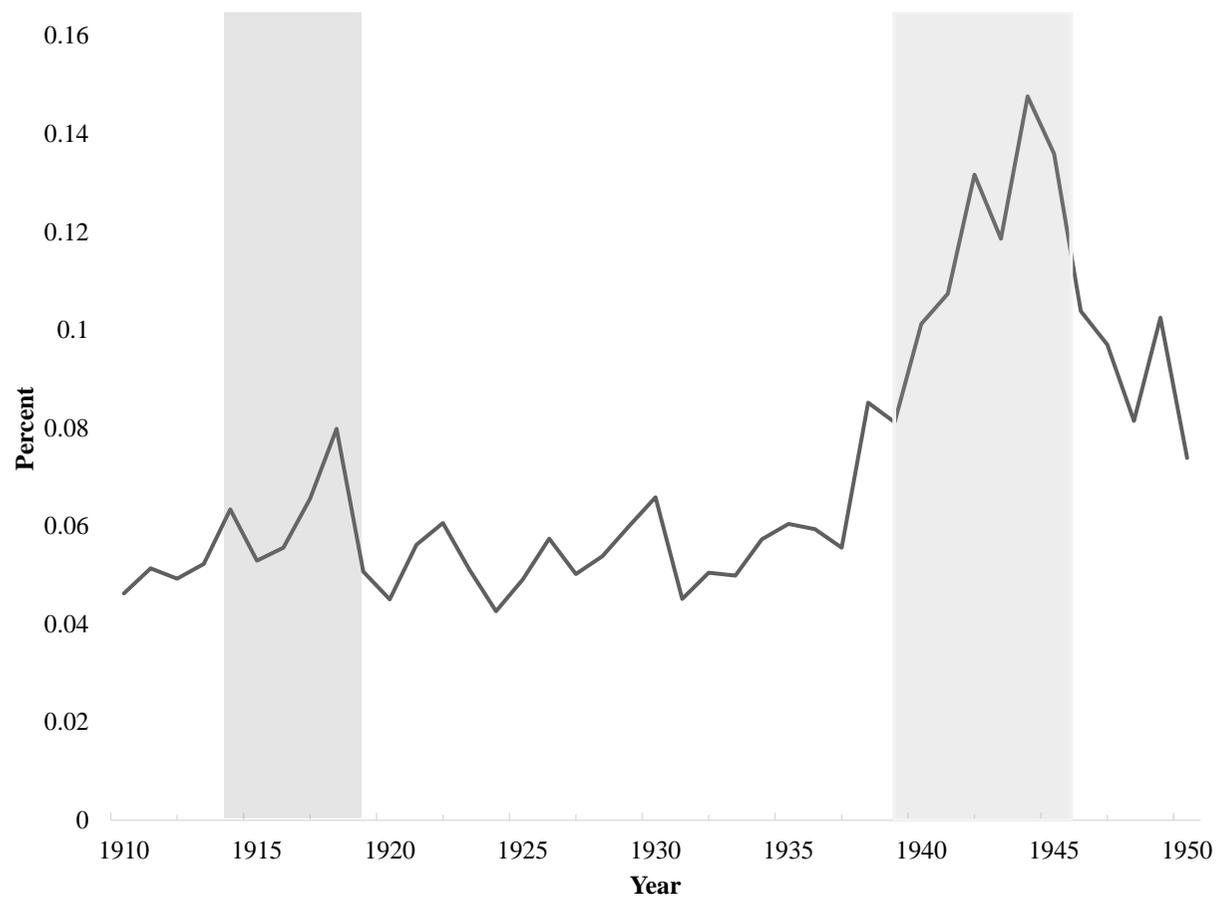
Source : Carreras-Marín, Badia-Miró, and Peres Cajías, 'Intraregional Trade'. Shaded areas indicate world war periods, 1914-1919 and 1939-1945.

Figure 3 – Share of each country in total imports of other four countries, 1912-1950
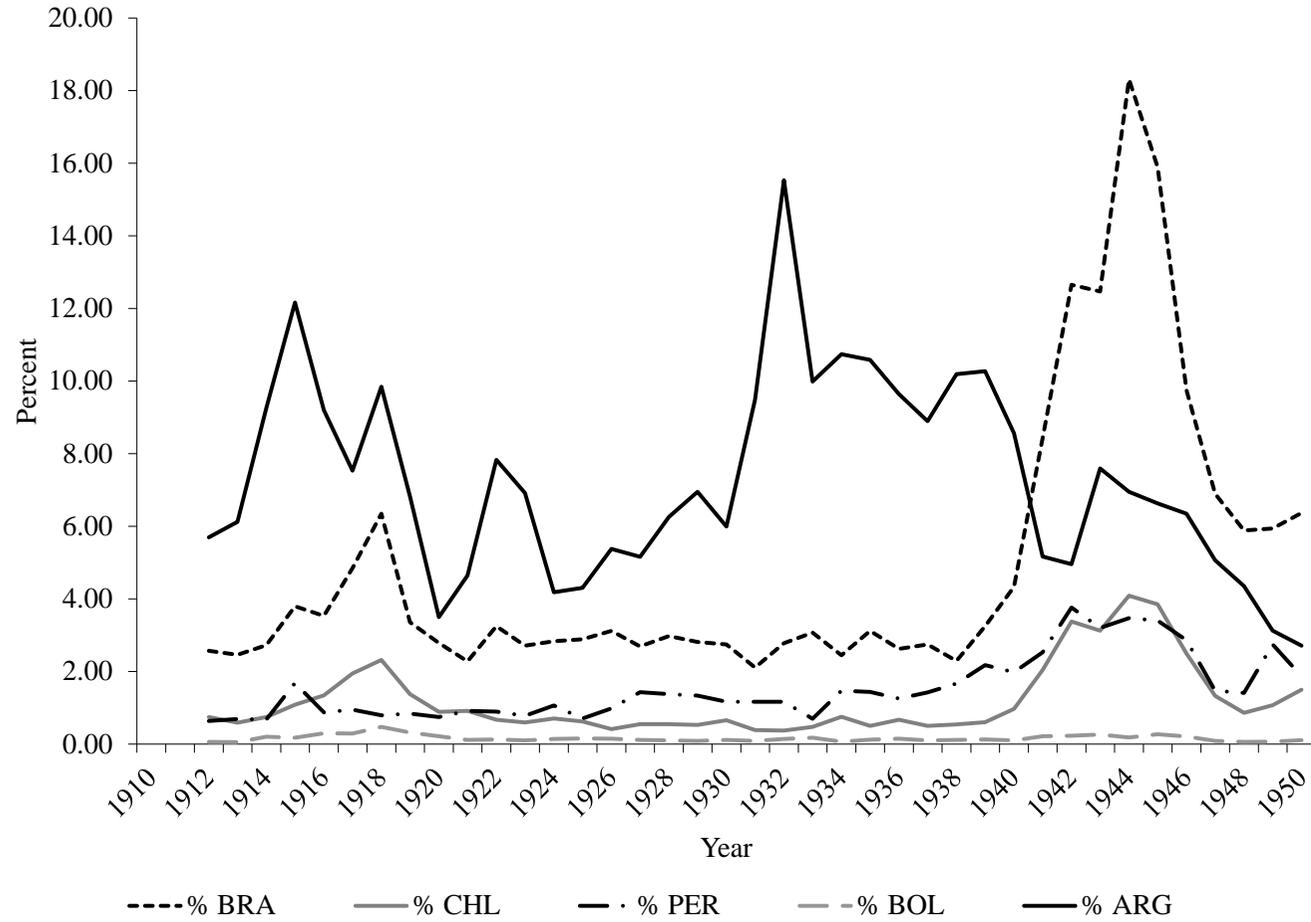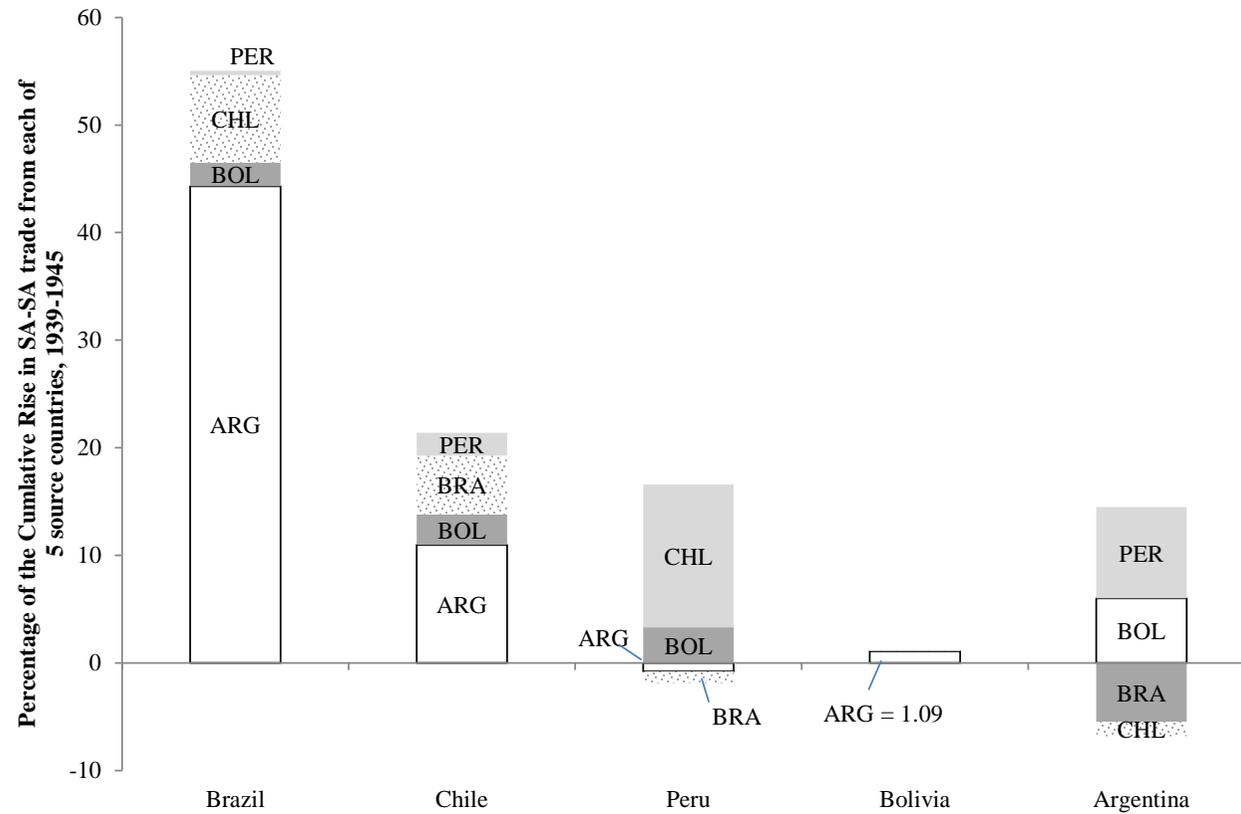
Figure 4 – Shares of the total rise in South American exports to South American destinations by source and country destinations.

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 corresponding to the total sahre for each source country. 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
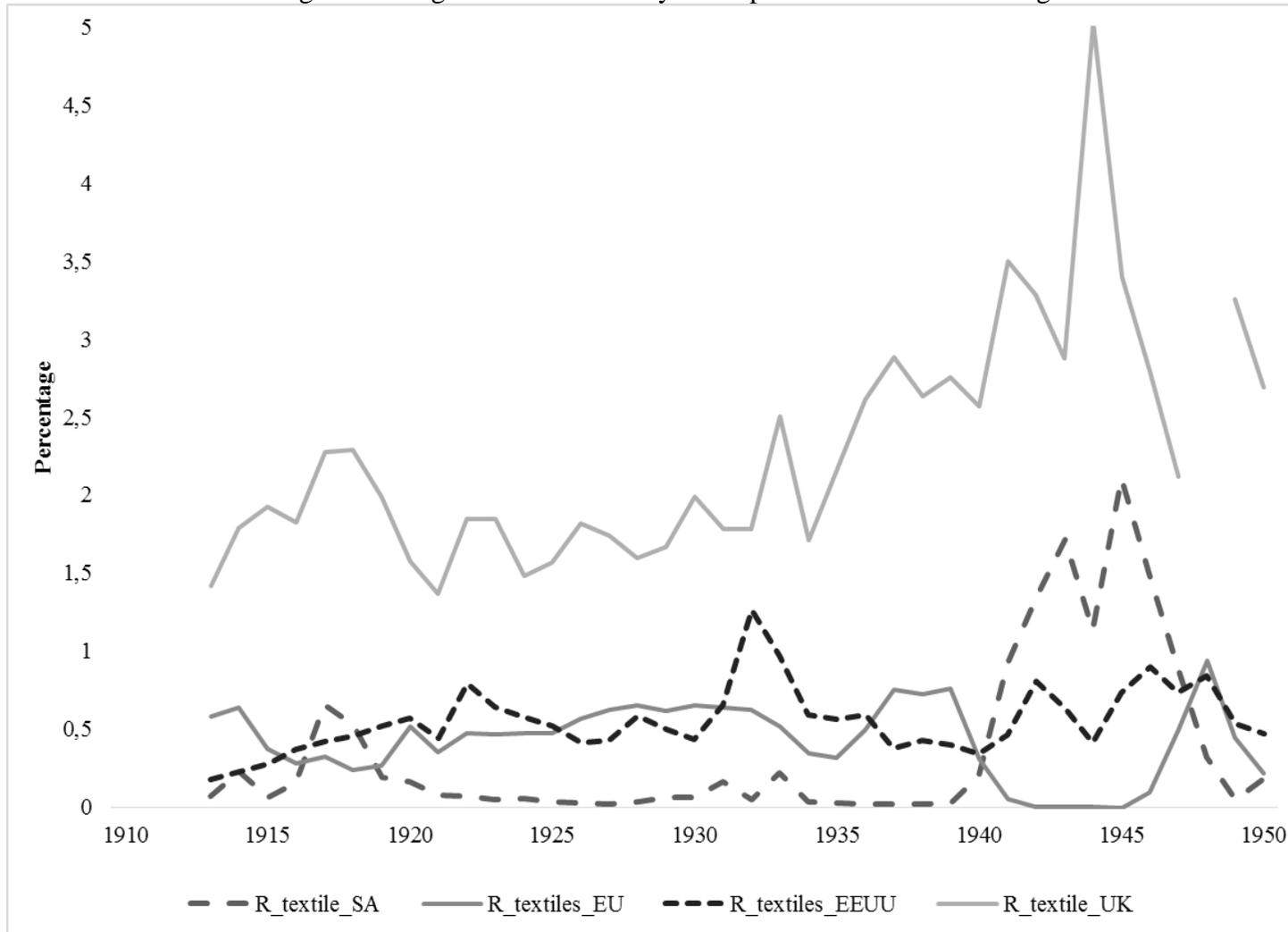
Notes: Regional trade indicator is defined as the share of Chilean imports in a particular industry (in this case, textiles) from a given region in total imports of that industry to the share of total Chilean imports coming from that region. These regions are South America (SA), Europe--Germany, France and Belgium (SU), the United Kingdom (UK), and the USA (EEUU). 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, Meissner, and Novy, 'Trade booms'. 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
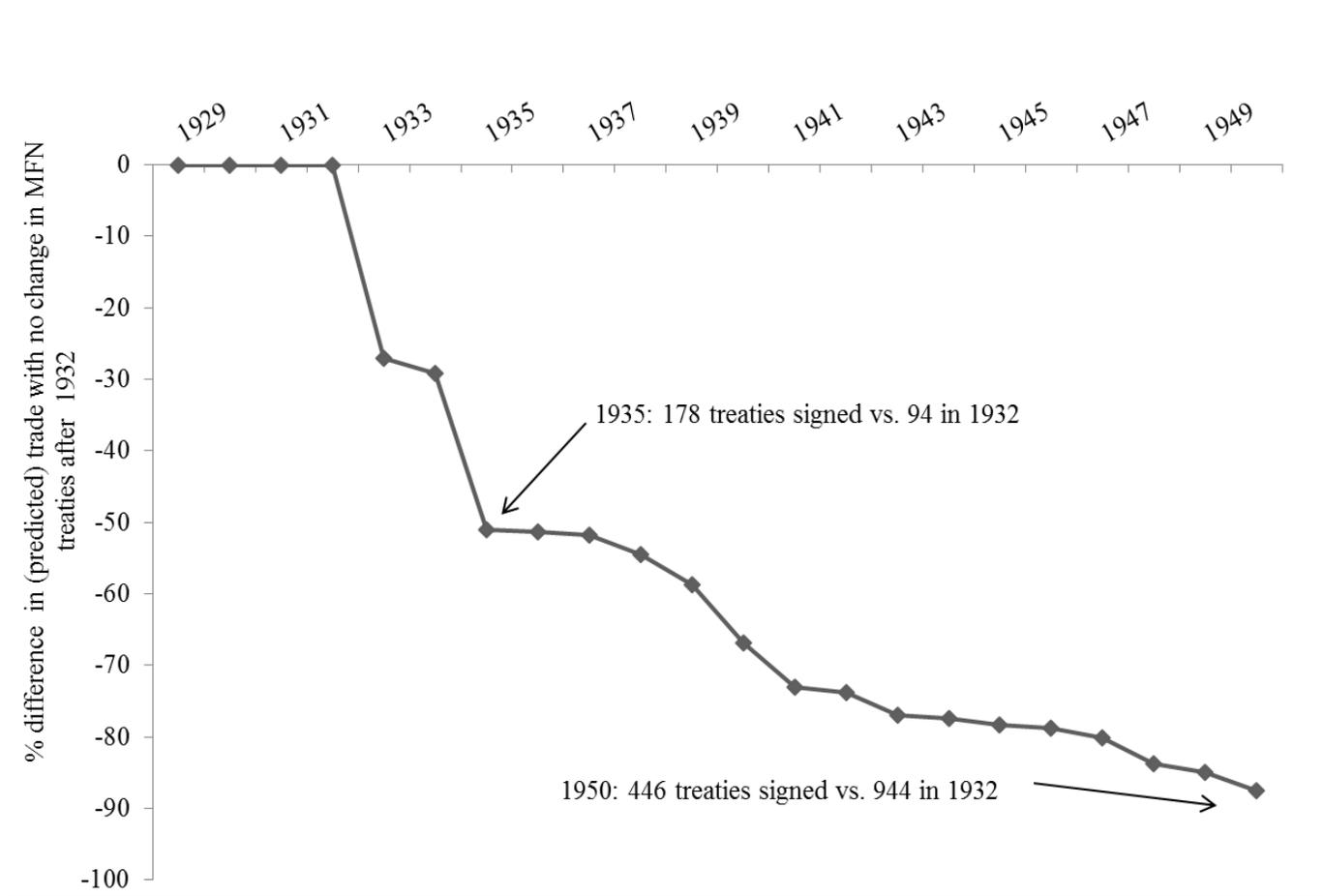
Notes: Figures represent the difference between actual trade and predicted levels of trade for Argentina if the number of treaties with each trade partner had been held constant at its 1932 value. Predicted values come from the gravity model presented in Table 5 column 3.

Figure 8 - Chilean textile import shares by source, 1916-1950
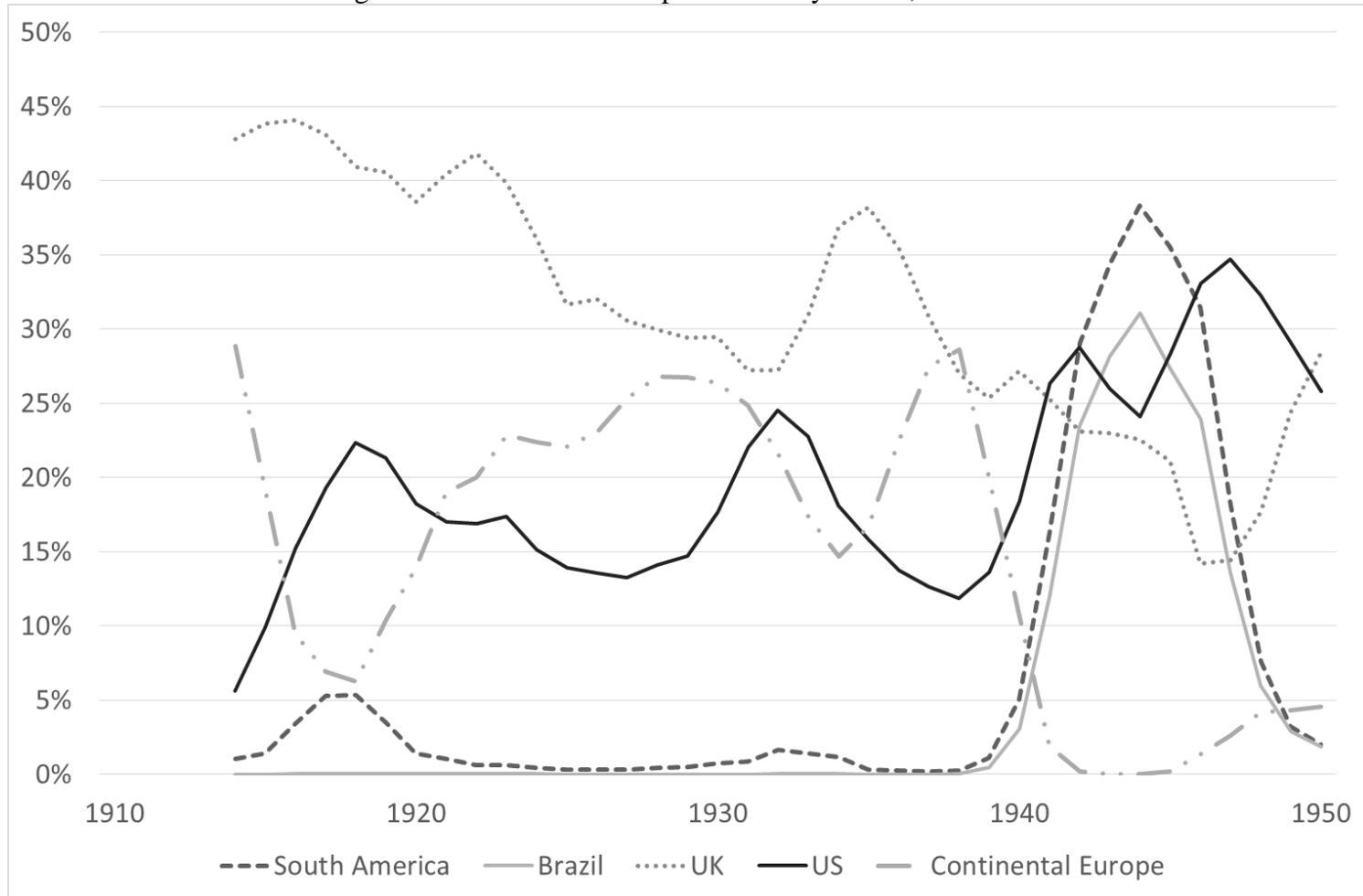
Notes: Figures are three-year moving averages. Underlying data begin in 1913. Brazil is included in South American trade and then reported separately. Continental Europe includes Germany, France and Belgium. Sources: Trade Statistical abstracts for various years.

Figure 9 - Share of Argentina in Brazilian trade, 1871-1950
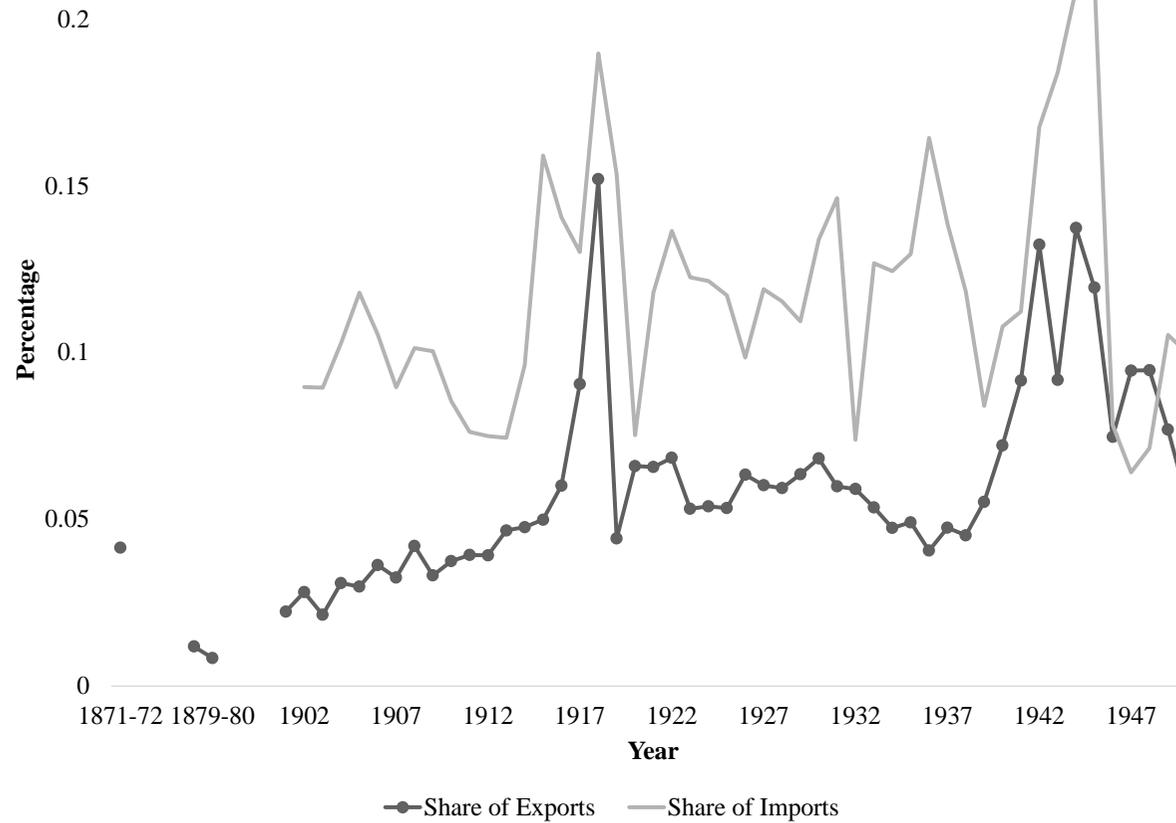
Source: Figures represent Brazil's exports to Argentina as a share of total Brazilian exports and Brazils' imports from Argentina as a share of total Brazilian imports. Foreign trade statistical abstracts. Various years.

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

Textiles — ■— Yerba Mate
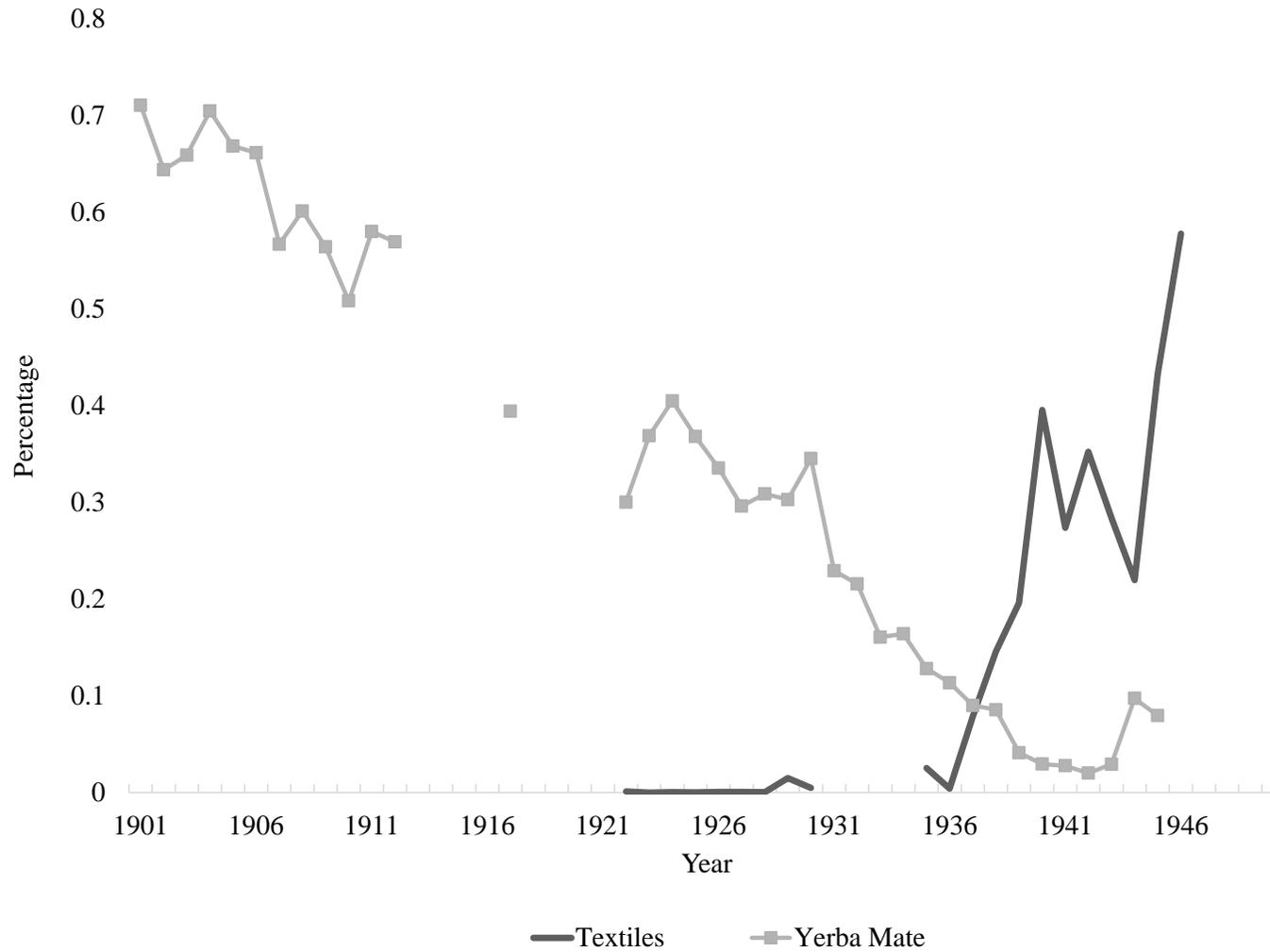
Source: Foreign trade statistical abstracts. Various years.

Figure 11 - Industrial textile production, domestic absorption, exports, and imports for Brazil, 1910-1950
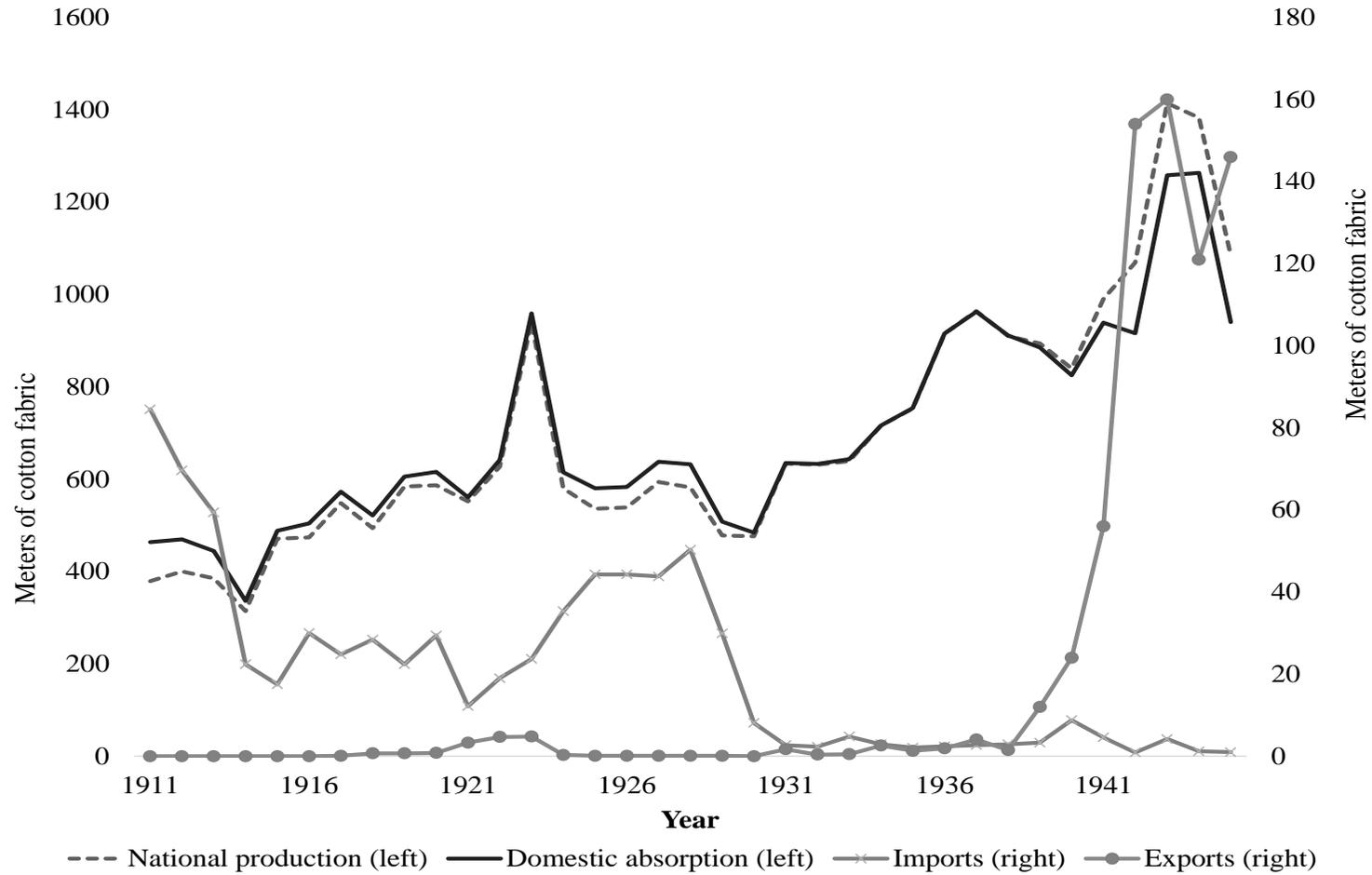
Source: Vilella and Suzigan, *Política do governo*. Domestic absorption is defined as total domestic production + imports – exports.

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.

Table 1 - Bilateral Exports, 1910-1950

	13 Country Sample, 1910-1919	13 Country Sample, 1935-1945	13 Country Sample, 1910-1950	13 Country Sample, 1910-1950	13 Country Sample, 1910-1950
Both Countries in Latin America	-1.51***	-2.15***	-1.38***	-1.38***	-1.37***
	[0.38]	[0.66]	[0.37]	[0.37]	[0.37]
Both in Latin America x World War I	0.72***	---	0.60***	0.60**	0.59**
	[0.17]		[0.23]	[0.24]	[0.25]
Both in Latin America x 1920s	---	---	---	---	-0.05
					[0.17]
Both in Latin America x Great Depression (1929-1938)	---	---	---	-0.02	---
				[0.15]	
Both in Latin America x World War II	---	1.07***	1.17***	1.16***	1.15***
		[0.31]	[0.24]	[0.24]	[0.23]
ln(distance)	-0.31***	-0.33***	-0.31***	-0.31***	-0.31***
	[0.09]	[0.13]	[0.10]	[0.10]	[0.10]
Both on the Gold Standard	-0.87***	0.74*	-0.05	-0.05	-0.05
	[0.22]	[0.42]	[0.10]	[0.10]	[0.10]
Shared border	0.90***	1.22**	0.78***	0.78***	0.78***
	[0.16]	[0.56]	[0.22]	[0.22]	[0.22]
Shared Language	0.16	0.72***	0.28*	0.28*	0.28*
	[0.15]	[0.21]	[0.17]	[0.17]	[0.17]
Number of Observations	1,440	1,584	5,904	5,904	5,904
Time-Varying Country-Fixed Effects	Yes	Yes	Yes	Yes	Yes

Notes: Dependent variable is nominal exports. Robust standard errors clustered on country pairs are reported in brackets. Time varying country fixed effects are included in columns in all columns. Method of estimation is Poisson PML.

*** p-value<0.01, ** p-value < 0.05, * p-value < 0.1

Table 2 - Bilateral Exports, 13 Countries, 1910-1950, Allowing for Pre-Trends

	13 Country Sample, 1910-1919	13 Country Sample, 1935-1945	**13 Country Sample, 1910-1950**
Both Countries in Latin America x trend	0.09**	0.18***	0
	[0.04]	[0.05]	[0.01]
Both Countries in Latin America	-1.92***	-7.26***	-1.44***
	[0.48]	[1.63]	[0.47]
Both in Latin America x World War I	0.49***	---	0.65***
	[0.18]		[0.16]
Both in Latin America x World War II	---	0.07	1.15***
		[0.32]	[0.23]
ln(distance)	-0.31***	-0.33***	-0.31***
	[0.09]	[0.13]	[0.10]
Both on the Gold Standard	-0.87***	0.75*	-0.05
	[0.22]	[0.42]	[0.10]
Shared border	0.90***	1.22**	0.78***
	[0.16]	[0.56]	[0.22]
Shared Language	0.16	0.72***	0.28*
	[0.15]	[0.21]	[0.17]
Number of Observations	1,440	1,584	5,904
Time-Varying Country-Fixed Effects	Yes	Yes	Yes

Notes: Dependent variable is nominal exports. Robust standard errors clustered on country pairs are reported in brackets. Time varying country fixed effects are included in columns in all columns. Method of estimation is Poisson PML.

*** p-value<0.01, ** p-value < 0.05, * p-value < 0.1

Table 3 - Bilateral Exports for South American Countries, US and UK, 1910-1950

	LATAM + US	LATAM + US	**LATAM + US**	LATAM +UK	**LATAM + UK**	LATAM +UK	**LATAM +US & UK**	LATAM +US &UK	LATAM +US & UK
Both Countries in Latin America	-2.15***	-0.73**	-0.63	-2.44***	-1.60***	-1.16**	-2.02***	-0.89***	-0.70*
	[0.23]	[0.34]	[0.41]	[0.47]	[0.48]	[0.47]	[0.22]	[0.31]	[0.38]
Both in Latin America x World War I	0.82***	---	0.94***	0.44**	---	0.50*	0.63***	---	0.70***
	[0.12]		[0.20]	[0.20]		[0.26]	[0.17]		[0.21]
Both in Latin America x World War II	---	1.25***	1.54***	---	-0.09	-0.17	---	1.10***	1.29***
		[0.26]	[0.22]		[0.38]	[0.29]		[0.21]	[0.20]
ln(distance)	-1.08***	-0.93***	-0.74**	-0.30**	-0.40***	-0.25**	-0.26***	-0.27**	-0.16*
	[0.24]	[0.33]	[0.34]	[0.15]	[0.14]	[0.12]	[0.10]	[0.12]	[0.10]
Both on the Gold Standard	-0.24	-0.01	-0.1	-0.51*		0.06	-0.70**	0.15	-0.08
	[0.36]	[0.26]	[0.13]	[0.27]		[0.15]	[0.29]	[0.21]	[0.11]
Shared border	1.49***	-0.35	0.08	2.11***	0	0.46	2.17***	0.36	0.69
	[0.28]	[0.47]	[0.56]	[0.25]	[0.28]	[0.38]	[0.25]	[0.30]	[0.44]
Shared Language	-0.25	0.37	-0.14	-0.55*	0.32	-0.18	-0.36**	0.27	-0.23
	[0.21]	[0.30]	[0.26]	[0.31]	[0.28]	[0.27]	[0.18]	[0.24]	[0.21]
Number of Observations	720	792	2,952	720	792	2,952	840	924	3,444
Time-Varying Country-Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Dependent variable is the value of nominal exports. Source countries include 5 different South American countries and the US, the UK or both the US and the UK. Robust standard errors clustered on the country pair are reported in brackets. 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 America 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**
	[0.393]	[0.462]	[0.402]
Partner in Latin America x World War I	---	0.33	0.98**
		[0.242]	[0.393]
Partner in Latin America x 1929-1938	---	-0.18*	0.22
		[0.100]	[0.215]
Exporter in Latin America x World War II	---	0.90***	0.48*
		[0.215]	[0.272]
Cumulative Treaties	0.04**	---	0.04**
	[0.017]		[0.019]
ln(distance)	-1.28*	-1.21	-1.28**
	[0.656]	[0.810]	[0.651]
Shared border	-1.87*	-0.7	-1.88*
	[0.991]	[0.906]	[0.982]
Both on the Gold Standard	0.60**	0.51**	0.59**
	[0.259]	[0.251]	[0.252]
Shared Language	-0.61**	-0.27	-0.62**
	[0.285]	[0.252]	[0.297]
ln(GDP) exporter	0.62***	0.69***	0.62***
	[0.080]	[0.074]	[0.082]
ln (GDP) importer	0.59***	0.66***	0.59***
	[0.134]	[0.142]	[0.135]
Number of Observations	1,546	1,546	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 are included but not reported.
*** 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.