Endogenous Tariffs and Growth: Asia versus Latin America 1870-1940

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Abstract

Despite an enormous literature that has analyzed the comparative experience of Latin America and Asia in post-World War II trade policy, almost no attention has been paid to their comparative experience prior to the 1940s. Even a cursory look at the available empirical evidence reveals tremendous contrasts between the two regions. Latin America had the highest tariff barriers the world around before 1914; Asia had the lowest. Protected Latin America's *belle époque* also boasted some of the most explosive growth, while Asia registered some of the worst. What brought the two regions to the opposite ends of the tariff policy spectrum? Was it just that Latin America had tariff autonomy while colonial Asia did not, or was the political economy of tariff setting much more complex? And what explains the rise of Asian tariffs, converging with those in Latin America, in the interwar years? Finally, were tariff barriers critical determinants of early industrialization in the poor periphery, or did terms of trade trends, evolving labor costs and productivity catch-up matter far more?

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Introduction

If laid end to end, all the pages written on the Latin American and Asian experience with trade policy since 1950 probably would stretch from Guayaquil to Guangzhou. However, almost no attention has been paid to their comparative experience before the 1940s. Even a cursory look at the best available empirical evidence reveals tremendous contrasts between the regions that demand explanation. Latin America had the highest tariff barriers in the world before 1914; Asia had the lowest. The protected Latin American *belle époque* also boasted some of the most explosive growth, while Asia registered some of the worst. What brought the two regions to the opposite ends of the tariff policy spectrum? Was it just that the Latin American republics had earner policy autonomy, while most of colonial Asia had not, or was the political economy of tariffs more complex? Why did Asian tariffs catch up with Latin American tariffs in the 1920s and 1930s? Why are the differences in economic performance so at odds with post-war conventional wisdom that free trade is good for growth? This paper offers some tentative answers.

We begin by describing our tariff database. These data are used to explore the impact of colonial rule and what the literature calls 'unequal treaties' on Asian tariffs, as well as the impact of world markets, geography and political economy on Latin American tariffs. At the end of the paper, we pose a research agenda: does tariff policy explain differences in industrialization experience within and between the two regions, or did other factors -- like terms of trade trends, the evolution of wage costs, and productivity catch-up with the leaders -- matter much more?

The Tariff Data

A well-developed international literature makes it clear that trade shares are very poor measures of openness since they are endogenous and can be driven by demand and supply factors

within countries which are completely independent of trade policy (e.g., Anderson and Neary 1994; Sachs and Warner 1995; Anderson 1998).[1] Among the explicit policy measures of openness available, the average tariff rate is by far the most homogenous protection measure and the easiest to collect across countries and over time. We are, of course, aware that countries can have the same average tariff levels, but very different tariff structures reflecting very different intent. Still, in primary-product exporting countries high average tariffs meant high tariffs on manufactures.[2] We are also aware that by the 1930s every country had learned how to use non-tariff barriers (NTBs), especially the manipulation of the real exchange rate to favor import competing industries. But NTBs were not used very frequently before the 1930s, and pretty much every country was on a fixed exchange standard before World War I and again by the late 1920s. In short, tariffs were the main instrument of trade policy before the 1930s. Thus, it seems to us that as an overall measure of protection, average tariffs are the place to start any empirical analysis of the political economy of protection. In addition, while high tariffs may not necessarily be the result of explicit pro-industrialization goals, high tariffs are still protectionist whatever the intent.

This paper uses the computed average tariff rate to explore differences between Asian and Latin American policy experience from shortly after the mid-19th century to World War II. Our country observations from these two regions are part of a larger world sample of thirty-five, extending up to 1950: the United States; 3 members of the European industrial core (France, Germany, United Kingdom); 3 English-speaking European offshoots (Australia, Canada, New

[1] Indeed, it appears that fully 67 percent of the late 20th century OECD trade boom can be explained by unusually fast income growth, not by the decline in trade barriers (Baier and Bergstrand 2001). To cite another example, 50 to 65 percent of the European overseas trade boom in the three centuries following 1492 were driven by income growth, rather than by any decline in trade barriers (O'Rourke and Williamson 2002: 439). As a final example, 57 percent of the world trade boom 1870-1913 was explained by income growth (Estevadeordal *et al.* 2003: Table III).

[2] See, for example, Bairoch (1993) and Williamson (2010: Chp. 13). Antonio Teña (personal correspondence) has estimated *ad valorem* tariffs on British manufacturing exports for four Latin American republics in 1914 (Argentina, Brazil, Chile and Mexico): while the tariff for all imports averaged 21.5 percent, the average tariff on British manufactures averaged 45 percent, more than twice as high. Similarly,

Zealand); 10 from the European periphery (Austria-Hungary, Denmark, Greece, Italy, Norway, Portugal, Russia, Serbia, Spain, Sweden); 10 from Asia and the Middle East (Burma, Ceylon, China, Egypt, India, Indonesia, Japan, the Philippines, Siam [Thailand], Ottoman Turkey [republican Turkey]); and 8 from Latin America (Argentina, Brazil, Chile, Cuba, Colombia, Mexico, Peru, Uruguay). Standard tariff histories focus mainly on seven relatively rich countries – Denmark, France, Germany, Italy, Sweden, the United Kingdom and the United States. While these data have already been used to help redress this big world imbalance (O'Rourke and Williamson 2002; Clemens and Williamson 2004; Coatsworth and Williamson 2004a, 2004b; Williamson 2006b), this paper does more by focusing on the 10 Asian and 8 Latin American countries in our sample that represent the poor periphery, and by exploring as well the interwar experience.

Average tariff rates are calculated as the total revenue from import duties divided by the value of total imports in the same year. In some cases, the sources used do not distinguish between import and export duties, and report only total customs duties. Total customs duties (instead of import duties) are used in the calculation of average tariff rates *only* for countries where the value of export duties has historically been an insignificant share of total customs duties. Sometimes, the value of import duties collected is reported for fiscal years, while import data generally refer to calendar years. While making a consistent effort to compare calendar year duties to calendar year import values, in cases where calendar year duties figures are unavailable, fiscal year duties are divided by calendar year imports to calculate average tariff. In these instances, fiscal year import duties are assumed to belong to the calendar year in which most of the fiscal year falls.[3]

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for the European periphery (Greece, Italy, Portugal, Russia, Spain): while the average tariff on all imports in 1914 was 18.4 percent, the tariff on British manufactures was 46.2 percent, almost three times higher.

[3] A complete appendix description of the sources and methods surrounding the tariff data base can be found in Blattman *et al*. (2002) and Clemens and Williamson (2004).

To emphasize, the remainder of this paper defines Latin America as the eight-country sample consisting of Argentina, Brazil, Chile, Colombia, Cuba, Mexico, Peru, and Uruguay. Asia is defined as the ten-country sample consisting of Burma, China, Ceylon, Egypt, India, Indonesia, Japan, the Philippines, Siam, and Turkey, while East Asia is defined by the sub-sample of China, Indonesia, Japan, the Philippines, and Siam.

Defining Tariff Autonomy

Our empirical analysis requires formalization of the concept of tariff autonomy, the freedom to set tariff levels independent of another state's military and political power. Table 1 documents the years in which each country is judged to have had tariff autonomy. Burma, Ceylon, and India were subject to British imperial tariff collection policies, as Cuba was to the Spanish through 1899, Indonesia (Netherlands Indies) was to the Dutch, and the Philippines was to both the Spanish up to 1898 and the US thereafter. The British Foreign Office in China largely eliminated the tariff restrictions imposed by the treaties of Nanking and Tientsin in 1929. Norway did not have an independent tariff policy under the Swedish crown through 1905. Gradual weakening of Ottoman control in Serbia is construed to imply tariff autonomy following the 1878 Treaty of Berlin. Egypt is taken to hold tariff autonomy under noninterventionist Ottoman rule during the years prior to the British invasion of 1882, but not thereafter. Thailand is taken to recover autonomy from the grasp of the unequal treaties in 1891 (Ingram 1971: 138) and Japan in 1900 (Lockwood 1968: 539). We take Turkey to have lost tariff autonomy in the brief years between its defeat in World War 1 and Mustafa Kemal's establishment of the Turkish Republic.

With these definitions of tariff autonomy in mind, we turn to colonial tariff policy next, followed by tariff policy under gunboat diplomacy.

Did Asian Colonies Simply Mimic Their Masters?

This is a good place to explore the tariff autonomy issue within the colonies. There are five in our sample, all in Asia: Burma, Ceylon, India, Indonesia and the Philippines, although foreign influence was strong enough (including occupation) to make Egypt behave like a colony after 1881 (Owen 1993: 122). To what extent did these six simply mimic their colonial masters?

Figure 1 reveals a clear correlation in timing and magnitudes of change in tariff rates between the UK and her four (Burma, Ceylon, Egypt and India), and Figure 2 shows the same for the Philippines, first for Spain and then for the US (becoming the imperialist master in 1899). Table 2 reports the master-colony tariff rate correlations for these four and the Philippines.[4] Colonial tariff policy did indeed mimic that of the masters: although Spain failed to imprint its tariff rates on the Philippines before 1899 (Figure 2), the US did afterwards, and Britain did so across all four of its Asian colonies in our sample (Figure 1). Furthermore, the t-statistics are very large and the slope coefficients are similar across masters and colonies, ranging between about 0.5 and 0.9.

But note the variance across these four at any point in time (Figure 1), and note the country-specific variance in the intercepts reported for the five in Table 2: Philippine tariff rates were on average about 2 points below the US after 1898; and compared with Britain, India's were about the same, Burma and Ceylon were 4 or 5 points higher, and Egypt was 10 points higher. Clearly, local conditions mattered even in colonies. Thus, we retain the full Asian sample in all that follows, although we will control for the tariff policy of the masters.

There are three surprises that emerge from this section. First, local conditions influenced tariff policy even in the colonies. For example, in the 1930s tariff rates ranged between 9.9% in the Philippines to 28.7% in Burma. Second, the colonies in Asia had higher tariffs than the

[4] The Netherlands is not part of our sample, and thus we cannot explore the same correlations between it and Indonesia.

"independents" elsewhere in Asia throughout the eighty years following 1870. For example, if we exclude Egypt and Turkey, in the 1890s Asian colonies had 7.1% tariff rates while Asian "independents" had 3.8%, and in the 1930s colonies had 19.3% tariff rates while "independents" had 17.3%. (See also Figure 3.) Third, tariffs rose to high levels everywhere in Asia during the 1930s, including the colonies. Indeed, the literature has not appreciated that by the end of the 1930s tariffs in Asia were as high as they were in Latin America (Figure 4), and this was long before the postwar independence moves to de-link from world markets by ISI strategies.

Gunboat Diplomacy and the Asian "Independents"

Independence did not necessarily mean tariff autonomy. Although our focus in this paper is tariff experience after 1870, we must start a couple of decades earlier to deal with the issue of Asian tariff autonomy.

Transport costs dropped very fast before World War I, accounting for about two-thirds of the integration of world commodity markets over the century following 1820, and for *all* of world commodity market integration in the four decades after 1870, when globalization backlash offset some of it (Lindert and Williamson 2002; Williamson 2006a: Chp. 3; Williamson 2010: Chp. 2). This political backlash was absent in Asia, partly because of the political influence wielded by native elites who appear to have had at least some control over the natural resources that were the base of their exports, partly because many of the colonialists were free traders, and partly because many Asian "independents" were persuaded to go open and stay open by gunboat diplomacy. As a result, commodity price convergence and trade creation between Europe and Asia were even more dramatic than within the Atlantic economy (O'Rourke and Williamson 1999; Williamson 2002, 2006a, 2010).

While the fall in transport costs was dramatic, it was not the greatest globalization event affecting 19th century Asia. Under the duress of Commodore Perry's American gun ships, Japan

signed the Shimoda and Harris treaties and in doing so switched from autarky to free trade in 1858 (Howe 1996: Chp. 30; Bernhofen and Brown 2004, 2005). It is hard to imagine a more dramatic switch in trade policy since Japan's foreign trade quickly rose from nil to 7 percent of national income,[5] and its terms of trade improved by a factor of 3.5 times (Huber 1971) to 4.9 times (Yasuba 1996). Between 1866 and 1895 the "unequal treaties" continued to limit Japanese tariffs to 5% *ad valorem* (Lockwood 1968: 18-19). Japan regained tariff autonomy in 1899, but "[e]ven the recovery of tariff autonomy in the nineties still left treaty restrictions on the duties applying to many items. Rates were generally no higher than 10 to 15% until the general tariff revision of 1911" (Lockwood 1968: 539).

Other Asian nations followed the same liberal path, most forced to do so by colonial dominance or gunboat diplomacy. Thus, and even before the Japanese humiliation, China signed a treaty with Britain in 1842 which opened her ports to trade. The treaties of Nanking (1843), Tientsin (1858), and other similar treaties, limited the Chinese *ad valorem* tariff rate on imports from essentially all of Europe to 5%. In fact, the treaties (and their revisions in 1870, 1902 and 1922) did not set *ad valorem* rates but rather nominal specific duties that, although initially equivalent to a 5% *ad valorem* tariff, rapidly declined in effective value as prices rose (Remer 1926: 171-81). Siam avoided China's humiliation by going open on its own and adopting a 3 percent tariff limit in 1855. Between 1865 and 1890 treaties with all the major powers kept import duties below 3% in Siam (Ingram 1971: 34-5). Only after 1890 did the Siam begin to revise the earlier treaties and increase tariff revenue by raising its tariff rates (Ingram 1971: 138). Korea emerged from being the autarkic Hermit Kingdom about the same time, undergoing market integration with Japan long before colonial status became formalized in 1910 (Brandt 1993; Kang and Cha 1996). India went the way of British free trade in 1846, and Indonesia followed Dutch

[5] This rise is computed over the fifteen years following 1858 (Huber 1971).

liberalism. Thus, and in contrast with Europe and Latin America, sharply declining transport costs were not offset in Asia by a rise in tariffs.

Some Latin American Belle Époque Surprises

A recent collaborative effort involving one of the present authors (Coatsworth and Williamson 2004a, 2004b) uncovered some facts that had not been well appreciated. Tariffs in Latin America were far higher than anywhere else in the world during the decades before World War I, long before the Great Depression when the region sounded an anti-global retreat into what became known as an ISI strategy. Indeed, they were even *rising* in the decades before 1914, a period that has been called the first globalization boom for the world economy (O'Rourke and Williamson 1999). This fact is surprising, and for three reason. First, it comes as a surprise given that this region has been said to have exploited globalization forces better than most of the poor periphery during the pre-1914 *belle époque* (Bulmer-Thomas 1994: Chp. 4). Second, it comes as a surprise since standard economic histories say so little about it (but see Gómez Galvarriato and Williamson 2009). Third, it comes as a surprise since most of us had always been taught to view the Great Depression as *the* critical turning point when the region is said to have turned towards protection and de-linked from the world economy for the first time (Diaz-Alejandro 1984; Corbo 1992; Taylor 1998).

These Latin American surprises can be seen in Figure 4, but they can be appreciated even better by comparisons with the rest of the world. As we noted above, conventional wisdom is that Latin American reluctance to go open in the mid-late 20th century was the product of the Great Depression and the anti-global import substitution strategies that arose to deal with it. Yet, late 19th century Latin America already had *by far* the highest tariffs in the world. For example, in 1885 the poor but independent parts of Latin America (Brazil, Colombia, Mexico and Peru) had tariffs almost five times higher than those in the poor and dependent parts of Asia (Burma,

Ceylon, China, Egypt, India, Indonesia and the Philippines). Perhaps more to the point, in the decades before 1914 tariffs in Latin America were, on average, five times higher than those in the European industrial core (Britain, France and Germany; Coatsworth and Williamson 2004a)!

At the crescendo of the *belle époque*, Latin American tariffs were at their peak, and still *way* above the rest of the world. For example, in 1905 tariffs in Uruguay (the most protectionist land-abundant and labor-scarce country) were about two and a half times those in Canada (the least protectionist land-abundant and labor-scarce country). In the same year, tariffs in Brazil and Colombia (the most protectionist Latin American countries) were almost ten times those in China and India (the least protectionist in Asia). Furthermore, the rise in Latin American tariffs from the late 1860s to the turn of the century was much steeper than was true of Europe, including France and Germany about which so much tariff history has been written (Gerschenkron 1943; Kindleberger 1951; Bairoch 1989; O'Rourke 2000). For example, the rise in the average tariff rate between the 1870s and the 1890s was 5.7 percentage points in France, up from 4.4 to still only 10.1 percent, and 5.3 percentage points in Germany, up from 3.8 to still only 9.1 percent. This heavily-researched continental move to protection is pretty modest when compared with the rise over the same period in the four poor Latin American countries (up 6.9 percentage points to 34 percent), and this for a region which has been said to have exploited the pre-1914 globalization boom so well by allowing exports to be an engine of growth!

Closed Jaguar, Open Dragon?

Figure 4 reveals the stark difference between Latin American and Asian tariff policy that persisted over the century between the 1860s and the eve of the Second World War. Black lines show regional means, while gray bands indicate one (regional) standard deviation above and below that mean.

Note the collapse in tariff rates across World War 1, a world-wide phenomenon due to the tendency for wartime inflation to erode the *ad valorem* equivalent of what were largely specific duties (i.e. pesos per kilo, yen per pound, dollars per barrel), not the result of tariff policy changes. The inflation-induced wartime fall was partially recovered in the 1920s. Note also that the tariff rate surged in the early thirties, spiking in 1933, again repeated across the globe, as world price levels collapsed, raising the *ad valorem* equivalent of those specific duties, not the result of tariff policy changes. However, Latin American and Asian tariff rates *continued* to rise after the world recovery and price rise: indeed, they rose *more* in Asia, reaching parity with and even exceeding Latin America 1934-1939. Of course, tariff rates were raised partly in response to America's Hawley-Smoot Act, but the main point is that tariff rates rose to high levels in Asia and Latin America even after prices began to inflate during the recovery from the Great Depression.

The impact of inflation and deflation on *ad valorem* tariff rate equivalents was huge in Asia and Latin America since the poor periphery relied so heavily on specific duties. Why were specific duties so common in poor parts of the world? There are two possible explanations. First, honest and literate customs inspectors are scarce in poor countries, but honest and literate customs inspectors are needed to implement an *ad valorem* tariff where import valuation is so crucial. So, legislators imposed specific duties to minimize the "theft" of state tariff revenues by dishonest and illiterate customs agents. Second, specific duties are more effective macro-stabilization devices in poor countries that rely so heavily on customs duties as a source of total government revenue. During booms, prices rise, lowering effective tariff rates, thus tending to mute the boom in tariff revenues generated by the boom in import demand. During slumps, prices fall, raising effective tariff rates, thus tending to offset the slump in tariff revenues generated by the slump in import demand. These macro-stabilization forces would be all the more valuable in pre-World War II Latin America and Asia when both regions were susceptible

to great price volatility in their commodity export markets (Blattman *et al.* 2007; Poelhekke and van der Ploeg 2007; Jacks *et al.* 2009; Williamson 2010: Chp. 10).

Why Were Latin American and Asian Tariffs So Different before WWI?

Table 3 seeks to identify those factors which explain the vastly different tariff levels between Latin America and Asia before 1914. The table estimates a model of cross-sectional differences in country tariffs, for all 35 countries in the world sample, not just those in Asia and Latin America. These regressions use a panel between effects estimator, since the question we seek to answer is cross-sectional—Latin America versus Asia. The first three columns address the fact that coverage of the inflation regressor in our database is limited to 30 of the 35 countries. The first column thus analyzes the full sample, the second column includes the same regressors but restricts the sample to data points for which inflation is not missing, and the third column includes inflation. The last three columns, which are intended to address concerns of endogeneity bias, will be discussed below.

What do we expect? The Table 3 right-hand side variables, suggested by previous work (Blattman *et al.* 2002; Coatsworth and Williamson 2004a, 2004b, Williamson 2006b), are the following (all but dummies in logs):[6]

Export share. This export/GDP ratio is a measure of export boom, where we expect booms in the previous year to diminish the need for high tariff rates this year—if government revenues are the goal—thus yielding negative coefficients in the regression;[7]

[6] A complete description of the right-hand side variables can be found in appendices to Clemens and Williamson (2004) and Blattman *et al.* (2002).

[7] In related paper on Latin America involving one of the present authors (Coatsworth and Williamson 2004a), capital inflows from Britain were added to the analysis for the years 1870-1913. This variable measured annual British capital exports to potential borrowing countries. Countries favored by British lending were shown to have had less need for tariff revenues and thus had lower tariffs. We do not add the variable here, since our source does not report the period 1914-1938.

GDP per capita, and ***Schooling***, the latter the primary school enrolment rate. These variables are taken as proxies for skill endowments, with the expectation that the more abundant the skills, the more competitive the industrial sector, and the less the need for protection (at least in Latin America and Asia where manufacturing was import competing), thus yielding a negative coefficient in the regression;

Population. Large countries have bigger domestic markets (especially interior markets) in which it is easier for local firms to find a spatial niche protected by transport costs. Alternatively, larger populations also imply higher density, a fact that makes domestic tax collection easier and tariff revenues less necessary. In either case, the demand for protection should be lower in such countries, and the regression should produce a negative coefficient;

Partner Tariffs, measured as a weighted average of the tariff rates in the trading countries' markets, the weight being trade volumes, lagged. Strategic tariff policy (e.g., Dixit 1987; Bagwell and Staiger 2002) suggests that countries should impose higher tariffs this year if they faced higher tariffs in their main markets abroad last year;

Effective Distance. The distance from each country to either the US or the UK (depending on trade volume), that distance adjusted by seaborne freight rates specific to that route. If protection was the goal, effective distance should have served as a substitute for tariffs, so the regression should yield a negative coefficient;

Railway Mileage added in kilometers. Poor overland transport connections to interior markets serves as a protective device. Railroads reduce that protection, requiring higher tariffs to offset the effect. Thus, the regression should yield a positive coefficient;

Urbanization, taken as share of population in cities and towns greater than 20,000. We take this urbanization statistic to be a Stolper-Samuelson proxy for the lobbying power of urban capitalists and artisans in the periphery (urban workers in import-competing industries rarely had the vote), thus yielding a positive coefficient in the regressions;

Tariff Autonomy, a dummy variable; taking a value 1 if a country has the freedom to set its own tariffs independently, and 0 otherwise. See Table 1;

Inflation and inflation-squared, the rates in home markets. To the extent that countries used specific duties, we expect inflation to lower tariff rates, thus yielding a negative coefficient. However, very rapid inflation might well have triggered a speedier legislative reaction with increases in specific duties, thus yielding a positive and offsetting coefficient on the squared term in the regression.

The regression model in Table 3 does well: all the coefficients in columns (a) and (c) take on their predicted signs and almost always pass significance tests. The coefficient of determination is likewise high for all specifications.

However, the model could produce biased coefficients if tariffs have a causal effect on GDP per capita or on exports (this last through a direct effect on imports coupled with a balance of payments mechanism linking imports and exports). In columns (4) through (6) we see that dropping either GDP per capita or exports (or both) has only minor effects on the magnitude and statistical significance of the other coefficients. The only important change appears to occur in the coefficients on schooling—which, we will see below, cannot affect our substantive conclusions.

Combined, the regressors in Table 3 explain 66 to 78 percent of the world cross-sectional tariff variation before 1914. What about the differences between Latin America and Asia? The first six columns of Table 4 are simply the coefficient estimates from Table 3, reproduced without modification. The next two columns give the average values of each regressor in both Latin America and Asia, in natural logarithms; at the bottom the same values for the regressand are shown. Of particular note is the similarity of the figures for effective distance, an average of physical distance to the top 5 trading partners weighted by exports sent to that partner, multiplied by an index of transportation costs. Asia may have been farther away from the core, but it was doing more intraregional trading than Latin America. Latin America had a notably higher share

of exports in GDP, a much smaller average population, much more railway penetration, and a much greater degree of tariff autonomy. It was also richer, more schooled, more urban, faced higher tariffs abroad, and underwent much higher rates of inflation.

The final six columns are a linear combination of the previous columns. The result is an estimate of the relative contribution of each variable to the much higher pre-1914 tariffs in Latin America compared with Asia. It is calculated in the following way. First, we take the difference between the average regressor value in Latin America and its value in Asia, from columns (7) and (8). Second, this difference is multiplied by the corresponding coefficient from the first six columns. Third, this number is divided by the average difference in ln(Own Tariff) between the two regions during this period (the last row of columns 7 and 8). The resulting ratio δ is an estimate of the relative contribution of each regressor to the regional difference in tariff rates. A value of zero means that the regressor is not responsible for any of the difference. A negative value indicates that the regressor actually contributed to tariffs being *lower* in Latin America than in Asia, *ceteris paribus*. We are looking for large positive values in those last two columns.

Some potential explanations for the difference can be eliminated immediately. Thus, the export share in GDP and GDP per capita were higher in Latin America than in Asia, instead of being lower as they would need to have been in order to contribute to the observed tariff differential between the regions. Differences in effective distance or schooling rates also cannot explain the difference. The relative importance of the remaining explanators is not affected by the inclusion or omission of inflation, nor is it affected by the exclusion of the potentially endogenous regressors GDP per capita and export share of GDP.

The five that clearly mattered were population size, railroad penetration, urbanization, partner tariffs and tariff autonomy. Take the first three first, saving tariff autonomy and partner tariffs for last. Asia's enormous populations provided gargantuan internal markets in which producers could exploit specialization and scale. Large internal markets tended to diminish the need for tariffs to protect import-competing producers. Latin America's exploding railroad

network increased access to that internal market, but it also exposed interior producers to more foreign competition, encouraging a tariff backlash to offset the impact of the railroads. The railroad system was less extensive in Asia, and in fact we have measured it in a fashion that understates the Asian railroad shortfall (miles of railway trunk line, rather than miles per capita). A less extensive railway system in Asia implied less need for tariffs for protective purposes.

Higher levels of urbanization in Latin America also help to explain the gap in tariff rates between Latin America and Asia. Ronald Rogowski (1989) has used the Stolper-Samuelson theorem to suggest that we look to Latin American urban capitalists for the political economy explanation for those extraordinarily high tariffs during the *belle époque*. Although their economies certainly varied in labor-scarcity, every Latin American country faced relative capital scarcity and relative land abundance. As the Stolper-Samuelson theorem has it, "protection benefits (and liberalization of trade harms) owners of factors in which, relative to the rest of the world, that society is *poorly* endowed" (Rogowski 1989: 3). According to this kind of thinking, urban capitalists should have been looking to form protectionist coalitions as soon as the Latin American *belle époque* and the *pax britannica* globalization forces began to threaten them with freer trade. High urbanization rates in Latin America gave these interests more power to achieve protection, while low rates in Asia contributed to the opposite result.

Even controlling for so many other factors, tariff autonomy was important. How much did it matter? After all, we have seen a variety of tariff rates even within colonies run by imperialists favoring free trade at home. Still, policy autonomy implied high tariffs before World War I, with the coefficient on the autonomy variable in the regressions ranging between 0.618 and 0.912 in columns (1) through (6). The model suggests, then, that granting tariff autonomy would have raised tariffs by 1.7 to 2.5 times, all else equal.[8] In other words, the model indicates that granting late 19th century Asia the same level of tariff autonomy as Latin America could have raised Asian tariffs from 7 to between 12 and 17 percent. Turning to columns (1´) through (6´),

we see that *Asia's lack of tariff autonomy only explains about one third of the tariff difference between Asia and Latin America*. But that leaves almost two thirds explained by the other factors.

Did the Asian countries subjected to unequal treaties, but not formally colonies (China, Japan, and Siam), have higher tariffs than those that were colonies (Burma, Ceylon, India, Indonesia, and the Philippines)? Surprisingly, they did not, as Figure 3 documents.

With policy autonomy, Asian tariff levels might have been half those of Latin America, rather than only a fourth. But, as we have seen, tariff autonomy was not the only factor at work. Internal market size mattered, as did the protection of the market that poor railroads offered domestic producers. Weak political power of the Asian urban capitalist mattered, a weakness associated with smaller urban presence there compared with Latin America. Finally, after controlling for tariff autonomy, partner tariffs mattered. If your trading partner had high tariffs, so did you. Since Latin America traded more with protectionist North America, while Asia traded more with free trade Europe (especially its free trade colonizers Britain and the Netherlands), more of the tariff rate gap between Latin America and Asia is explained.

We cannot leave this section without saying a word about historical persistence, especially in the case of Latin America. Table 3 covers the four decades after 1870, but what about the half century before? Does it matter that this post-independence period was extremely violent in Latin America?

In young, recently independent economies with low or even declining capacity to tax income, expenditure or wealth, few bureaucratic resources to implement efficient collection, and limited access to foreign capital markets, customs revenues are an easy-to-collect source essential to support central government expenditures on infrastructure and especially defense. This was certainly true of the newly-independent United States and Latin American countries in the first half of the 19th century, although the US had more success in gaining access to European capital markets. The average share of customs duties in total revenues across eleven Latin American

[8] Since the dependent variable is in logs, $0.618 \times 2.72 = 1.68$ and $0.912 \times 2.72 = 2.48$.

republics was 57.8 percent between 1820 and 1890 (Centeno 1997: Table 1). Furthermore, customs revenues are especially important for land-abundant countries with federal governments since they do not have the population and tax-payer density to make other forms of tax collection efficient.[9] Now add to these facts a huge revenue need to fight civil wars, and to repel foreign invaders, we emerge with the high United States tariffs during its Civil War of the 1860s and the high (and rising) tariffs in the newly-independent Latin America republics that experienced almost continuous war and civil conflict between the 1820s and the 1870s (Mares 2001; Centeno 1997; Bates *et al.* 2007).

The preoccupation with national defense and internal security pushed the newly independent Latin American republics toward higher revenue-generating tariffs. Military expenditures quickly rose to consume over 70 and often more than 90 percent of all revenues (Centeno 1997). Weak governments, under attack from within and without, abandoned internal taxes that required an extensive and loyal bureaucracy to collect and concentrated instead on tax collection at a few ports and mines. Thus, levels of "protection" rose in every Latin American country (for which there are data) as did the customs revenues as a percentage of total government revenues.

We stress these facts since we believe historical persistence matters and that some part of those very high Latin American tariffs between 1870 and World War I can be explained by the level of violence in the half century *before* 1870, violence so particular to Latin America during what was otherwise a *Pax Britannica* world.

[9] For federal governments, customs revenues were even bigger share of total revenues in Latin America (65.6 percent)

What Explains the Interwar Rise in Asian Protection?

Why did Asian tariffs rise to those high Latin American heights during the interwar years, especially during the 1930s? Note that it was not just one or two Asian countries pushing those tariffs up, since Figure 5 shows that it was ubiquitous across the whole region. Only Japan and the Philippines failed to raise tariffs in the 1930s. But every other Asian country did so in both decades, with the biggest tariff surge taking place for Burma, Ceylon, China, India and Siam [Thailand]. What was different about the interwar decades? Table 5 repeats for the interwar decades the same regressions reported in Table 3 for the pre-WWI decades. The comparison is striking: the coefficients on all the fundamentals driving tariff levels are repeated after World War I except one – *tariff autonomy*. Thus, while countries with tariff autonomy had much higher tariffs before World War I, they did not thereafter! That is, while the tariff autonomy coefficient was positive and significant before the War, it was insignificant afterwards. However, the partner tariff effect was even stronger in the interwar decades. It seems clear that the American and European hegemons released their grip on their colonies and dependent partners in the interwar years, and that their colonies chose to do as their masters did – raise tariffs. Table 6 shows this diminished colonial effect quite explicitly. The first row of the Oaxaca-Blinder decomposition reports the portion of the difference in log tariffs between Asia and Latin America due to differences in the value of the right-hand side variables, the second due to the difference in the coefficients between the two regions, while the third due to both ('interaction'). The table confirms what we asserted above: for the 1930s, we cannot reject the hypothesis that all three of these components are zero, meaning that the ability of our endogenous tariff model to explain the difference between the two regions falls apart in the 1930s (the residual goes way up). Even for the interwar as a whole, it appears that differences in the regressors (e.g. autonomy) aren't driving the regional tariff gap any more, but rather in how the regressors affect tariffs (the coefficients).

It seems to us that the moral is this. If we are looking for the historical origins of inward-looking and anti-market ISI strategies in much of Asia during the post-World War II period, we will find them in this interwar transition of the colonies and dependents to policy autonomy, not just in their response to the global crisis of the 1930s.

The Pre-1914 Tariff-Growth Correlation

Table 7 summarizes the variance in tariff rates before 1914. The average Latin American country had four times the tariff level of the average Asian country. Table 8 gives average tariffs for each country during three different time periods (1870-1899, 1900-1913, 1919-1938). Setting aside for a moment the relatively high tariffs of the Philippines, every Asian country had lower tariffs than every Latin country before 1914. As we have seen, this was not true in the decade after World War I when three Asian countries nudged their tariff rates up in to Latin American ranges (Burma, Egypt, Turkey). And, to repeat, by the late 1930s Asia on average had *higher* tariffs than Latin America.

Interwar experience aside, the pre-1914 experience invites an exploration of the tariff-growth trade-off. Figure 6 presents cross-sectional unweighted average GDP per capita, in 1990 US$, for the two regions. Despite variation within the sample and interwar troubles, the big morals of Figure 6 are that: Latin America started from a far richer resource base and thus a much higher per capita income; her *belle époque* growth experience left Asia far behind; but the GDP per capita gap between Latin America and Asia stopped widening in the interwar decades.

So, were high tariffs associated with fast growth before World War I? Latin America had enormous tariffs and an impressive growth performance, while Asia had low tariffs and slow growth, but we think that this correlation is spurious and likely to have been driven by third factors specific to all countries within a given region. Thus, while Figure 7 shows that all Latin American countries had high tariffs and fast growth 1900-1913, compared with Asia (except

Ceylon), it also shows (with nonparametric regression lines) that *within* these two regions, *high tariffs were correlated with slow growth.* In short, this pre-1914 evidence is quite consistent with findings coming from the modern evidence since 1970, e.g. that free trade is consistent with fast growth and protection with slow growth. The between country correlation – high tariffs associated with fast growth and low tariffs with slow growth – must be attributed to third factors driving both. Future research should explore this issue at greater length by looking at industrialization and third factors, a point we pursue in the next section.

Agenda: Did Tariff Policy Influence Industrialization in Asia and Latin America?

In some parts of Asia and Latin America, modern industrialization started more than a century ago. Latin America had two emerging industrial leaders in the late 19th century – Brazil and Mexico, Asia had four – Bengal, Bombay, Japan and Shanghai, and the European periphery had at least three – Catalonia, the north Italian triangle and Russia. Why did Asian and Latin American industrialization start in the late 19th century and why in some places and not in others? No doubt the answer is as complex as any question dealing more generally with the causes of modern economic growth, and no doubt any answer should include much-cited fundamentals like culture, geography, institutions and good government. And no doubt those fundamentals would help explain any manufacturing productivity catch-up (or its absence) in Asia and Latin America. But as to timing and magnitudes, here global forces have a chance to shine. What role did tariffs play? What role did world market forces play?

The economics literature suggests four possible explanations, but that literature does not yet offer an empirical assessment of their importance between 1870 and 1940. The big four are: ***Trade barriers***: Higher ***tariffs*** and non-tariff barriers must have reduced competitive pressure on local import-competing manufacturing, in effect by raising the price of their output in domestic markets. In contrast, falling transportation costs across sea lanes (***effective distance***) would have

increased competitive pressure on home manufacturing, and railroad development (***railway mileage*** per land area) would have done the same by exposing internal markets to more foreign competition. How big were those effects, and was tariff policy the most important of them?

Terms of trade and world markets: A secular rise in primary product prices may foster an export boom in the poor periphery – as well as GDP per capita gains, but it will also cause de-industrialization. The 19th century offers abundant evidence confirming this effect, whether for India (Clingingsmith and Wiliamson 2008), Mexico (Dobado *et al.* 2008), or the Ottoman Empire (Pamuk and Williamson 2009). But if a primary product export price boom fostered de-industrialization in the poor periphery, the secular export price slump between the 1870s or 1890s and the 1930s[10] should have fostered industrialization there as well.

Wage costs: As the poor periphery fell further behind the fast-growing industrial core up to World War I – what we now call the Great Divergence, wage costs per unit of labor fell in the poor periphery relative to the industrial core. Furthermore, since, absent the role of trade barriers, manufacturing prices were similar the world around, the own wage in manufacturing (the nominal wage divided by the price of manufacturing output) must also have fallen in the poor periphery relative to the rich industrial core. This rising gap should have given the poor periphery an increasing cost advantage in their domestic markets, *ceteris paribus*, fostering industrialization, led by labor-intensive manufacturing.

Productivity catch-up: Given wage costs, given world market conditions, and given tariff policy, productivity catch-up of domestic manufacturing on the industrial leaders should surely have fostered industrialization in the poor periphery. This, one supposes, is where the role of pro-growth institutions and good government should shine.

While these are the big four, any future analysis should also control for domestic market size (***GDP***), the level of human capital per capita (***schooling***) – required more intensively in manufacturing than in primary product production, whether the country was a ***colony*** -- and thus

whether it had autonomy over other than just tariff policy, and other forces, like whether parts of interwar Asia were mimicking pro-industrial policies in emerging industrial new comers like Brazil, Mexico and Russia/USSR.

The problem is that we do not yet have enough evidence to do the empirical analysis properly. But that evidence is on the way.[11]

Concluding Remark

Are there lessons from history here? Perhaps, but we prefer to end instead with the following challenge: Any theoretical claim that liberal trade policy lies at the heart of postwar growth performance over the last half century in these two regions must also explain why high tariffs did not to dampen growth or industrialization during the Latin American *belle époque* and why low tariffs did not ignite growth or industrialization in Asia before 1914.

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[10] As famously-noted by Raoul Prebisch (1949) and Hans Singer (1950). See also Williamson (2008).

[11] Aurora Gómez Galvarriato and Williamson are collecting data on the imports of fuel, intermediates and capital goods in to manufacturing for the poor periphery 1870-1940, by looking at exports of such products from France, Germany, the UK and the US. These data will be used as proxies for industrialization. Also, Williamson is establishing a data base summarizing average labor productivity growth in manufacturing across the poor periphery over these seven decades. This will allow us to identify who in the poor periphery underwent manufacturing catching-up on the fast-growing leaders, and when.

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Table 1 Tariff Autonomy

Over the years spanning 1870 to 1938, the periods during which countries are deemed to have autonomy over setting tariff rates were:

Argentina	All
Australia	All
Austria/Austria-Hungary	All
Brazil	All
Burma	None
Canada	All
Ceylon	None
Chile	All
China	1929 and after
Colombia	All
Cuba	1899 and after
Denmark	All
Egypt	Before 1882
France	All
Germany	All *except* 1919-1925
Greece	All
India	None
Indonesia	None
Italy	All
Japan	1900 and after
Mexico	All
New Zealand	All
Norway	1906 and after
Peru	All
Philippines	None
Portugal	All
Russia/USSR	All
Serbia/Yugoslavia	1878 and after
Spain	All
Sweden	All
Thailand	1891 and after
Turkey	All *except* 1919-1923
United Kingdom	All
United States	All
Uruguay	All

Table 2

Correlation between Tariffs in Colonies and Colonial Master

Country's tariff as dependent var.	**Egypt**	**Burma**	**Ceylon**	**India**	**Philippines**	**Philippines**
Time Period	**1865-1945**	**1865-1945**	**1865-1945**	**1865-1945**	**1865-1898**	**1899-1945**
UK Tariffs	0.607	0.672	0.493	0.893		
	6.65	*8.62*	*17.5*	*16.5*		
	0.587	**0.685**	**0.886**	**0.874**		
Spain Tariffs					–0.0807	
					–0.456	
					–0.0791	
USA Tariffs						0.870
						10.2
						0.839
Constant	10.0	4.84	4.32	0.198	11.4	–2.16
	7.51	*4.25*	*10.5*	*0.249*	*3.49*	*–1.47*
N	86	86	86	86	35	46
R^2	0.345	0.469	0.785	0.763	0.00630	0.704

OLS regressions. t-statistics are in italics and standardized coefficients are in bold below each coefficient

Table 3 Why Were Tariffs Higher in Latin America than in Asia before World War I?

Dependent variable: ln (Own Tariff[1])
Sample: 35 Countries[2], 1870-1913
Panel between effects estimator

	(1)	(2)	(3)	(4)	(5)	(6)
ln (Exports/GDP)	–0.398	–0.195	–0.384		–0.410	
	(1.68)	(0.92)	(1.60)		(1.62)	
ln (GDP/capita[3])	–0.421	–0.524	–0.506	–0.533		
	(1.44)	(1.71)	(1.79)*	(1.82)*		
ln (Population)	–0.477	–0.430	–0.612	–0.384	–0.605	–0.359
	(3.27)***	(3.13)***	(3.65)***	(4.17)***	(3.41)***	(3.74)***
ln (Partner Tariff[4])	0.436	0.505	0.445	0.407	0.438	0.397
	(2.31)**	(2.56)**	(2.38)**	(2.11)**	(2.21)**	(1.94)*
ln (Effective Dist[5])	0.086	0.141	–0.059	0.029	–0.092	0.001
	(0.98)	(1.44)	(0.47)	(0.25)	(0.70)	(0.01)
ln (Railway Miles[6])	0.190	0.141	0.386	0.227	0.388	0.219
	(2.06)*	(1.70)	(2.73)**	(2.16)**	(2.60)**	(1.97)*
ln (Schooling[7])	–0.117	0.097	–0.264	–0.037	–0.475	–0.244
	(0.70)	(0.53)	(1.08)	(0.18)	(2.08)*	(1.32)
ln (Urbanization[8])	0.174	0.082	0.292	0.138	0.239	0.070
	(1.18)	(0.53)	(1.67)	(0.91)	(1.32)	(0.45)
Tariff Autonomy[9]	0.760	0.618	0.912	0.795	0.843	0.713
	(2.61)**	(2.10)**	(2.84)**	(2.44)**	(2.50)**	(2.10)**
Inflation			–0.030	0.034	–0.037	0.030
			(0.39)	(0.50)	(0.47)	(0.43)
Inflation Squared			0.003	0.002	0.003	0.002
			(2.10)*	(1.43)	(2.07)*	(1.39)
Constant	5.435	4.989	7.030	5.870	5.261	3.918
	(3.14)***	(2.92)***	(3.83)***	(3.34)***	(3.22)***	(2.67)**
Observations	1,528	1,174	1,174	1,174	1,174	1,174
No. countries	35	30	30	30	30	30
R-Squared	0.655	0.717	0.784	0.753	0.745	0.710

Absolute value of t-statistics are in parentheses below coefficient estimates. * significant at 10%; ** significant at 5%; *** significant at 1%. [1] Import duties over imports. [2] Argentina, Australia, Austria-Hungary, Brazil, Burma, Canada, Ceylon, Chile, China, Colombia, Cuba, Denmark, Egypt, France, Germany, Greece, India, Indonesia, Italy, Japan, Mexico, New Zealand, Norway, Peru, Philippines, Portugal, Russia, Serbia, Siam, Spain, Sweden, Turkey, United Kingdom, United States, and Uruguay. [3] In 1990 US$. [4] Index of average tariff levels in top 5 trading partners weighted by exports going to that partner. [5] Product of average physical distance to top 5 trading partners (principal city to principal city) weighted by exports going to that country, and transportation cost index. [6] Miles of railway trunk line in country. [7] Fraction of the population below the age of 15 that is enrolled in primary school. [8] Fraction of the population living in agglomerations of greater than 50,000 people. [9] Indicator variable taking the value 1 if country has he freedom to set own tariff levels independently, or 0 if it does not.

Table 4 What Accounts for the Difference in Tariffs between Latin America and Asia before 1914?

	Coefficient estimates from Table 3						*Average regressor values:* Latin America	Asia	Fraction of regional difference explained: $\delta = \frac{\text{Coeff.} \times (\text{L.Am. avg.} - \text{Asia avg.})}{(\text{L.Am. tariff} - \text{Asia tariff})}$					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1′)	(2′)	(3′)	(4′)	(5′)	(6′)
ln (Exports/GDP)	–0.398	–0.195	–0.384		–0.410		*–1.94*	*–2.96*	–0.28	–0.14	–0.27		–0.29	
ln (GDP/capita)	–0.421	–0.524	–0.506	–0.533			*7.16*	*6.59*	–0.17	–0.21	–0.20	–0.21		
ln (Population)	–0.477	–0.430	–0.612	–0.384	–0.605	–0.359	*8.18*	*10.0*	0.62	0.56	0.79	0.50	0.78	0.46
ln (Partner Tariff)	0.436	0.505	0.445	0.407	0.438	0.397	*2.71*	*2.14*	0.17	0.20	0.17	0.16	0.17	0.16
ln (Effective Dist.)	0.086	0.141	–0.059	0.029	–0.092	0.001	*8.09*	*7.99*	0.01	0.01	0.00	0.00	–0.01	0.00
ln (Railway Miles)	0.190	0.141	0.386	0.227	0.388	0.219	*7.20*	*5.72*	0.20	0.15	0.40	0.23	0.40	0.23
ln (Schooling)	–0.117	0.097	–0.264	–0.037	–0.475	–0.244	*6.96*	*6.11*	–0.07	0.06	–0.16	–0.02	–0.28	–0.14
ln (Urbanization)	0.174	0.082	0.292	0.138	0.239	0.070	*4.55*	*3.94*	0.07	0.03	0.12	0.06	0.10	0.03
Tariff Autonomy	0.760	0.618	0.912	0.795	0.843	0.713	*0.918*	*0.211*	0.37	0.30	0.45	0.39	0.41	0.35
Inflation			–0.030	0.034	–0.037	0.030	*2.06*	*0.486*			–0.03	0.04	–0.04	0.03
Inflation Squared			0.003	0.002	0.003	0.002	*96.9*	*224*			–0.27	–0.18	–0.27	–0.18
ln (Own Tariff)							*3.24*	*1.80*						

Coefficient estimates in columns (1) through (6) are taken directly from Table 3. Columns (7) and (8) show the average value of the underlying regressor before 1914 in Latin America and Asia, respectively, where Latin America includes Argentina, Brazil, Chile, Colombia, Cuba, Mexico, Peru, and Uruguay, and Asia includes Burma, China, Ceylon, Egypt, India, Indonesia, Japan, Philippines, Siam, and Turkey. Columns (1') through (6') take the difference between columns (7) and (8), multiply this difference by the corresponding coefficient from one of the first six columns, and divide by the difference between average ln(Own Tariff) in Latin America and average ln(Own Tariff) in Asia. This value δ can be interpreted as the fraction of the difference between the two regions' tariffs that is explained by each regressor. Since tariffs were higher in Latin America, a negative value of δ suggests that the regressor cannot explain the observed difference; a large positive value suggests it can.

Table 5 Why Were Tariffs Higher in Latin America than in Asia in the Interwar Period?

Dependent variable: ln (Own Tariff[1])
Sample: 35 Countries[2], 1919-1938
Panel between effects estimator

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	lntariff	Lntariff	lntariff	lntariff	lntariff	lntariff
ln (Exports/GDP)	–0.215	–0.262*	–0.179		–0.153	
	(1.591)	(1.906)	(1.281)		(0.966)	
ln (GDP/capita[3])	–0.620***	–0.659***	–0.608**	–0.589**		
	(2.861)	(2.967)	(2.782)	(2.666)		
ln (Population)	–0.473***	–0.491***	–0.446***	–0.333***	–0.399***	–0.304***
	(4.062)	(4.036)	(3.719)	(4.038)	(2.971)	(3.332)
ln (Partner Tariff[4])	0.615*	0.698*	0.827**	0.718**	0.873**	0.779*
	(1.748)	(2.031)	(2.378)	(2.102)	(2.222)	(2.049)
ln (Effective Dist[5])	0.0421	0.0385	0.0452	0.0828	–0.0118	0.0219
	(0.470)	(0.404)	(0.489)	(0.934)	(0.116)	(0.229)
ln (Railway Miles[6])	0.378***	0.384***	0.344***	0.282***	0.302**	0.250**
	(4.057)	(3.909)	(3.522)	(3.282)	(2.763)	(2.632)
ln (Schooling[7])	–0.296	–0.234	–0.213	–0.197	–0.589***	–0.565***
	(1.428)	(1.134)	(1.058)	(0.966)	(3.479)	(3.378)
ln (Urbanization[8])	0.290*	0.275*	0.219	0.168	0.0975	0.0570
	(1.902)	(1.744)	(1.373)	(1.073)	(0.561)	(0.339)
Tariff Autonomy[9]	–0.0605	–0.103	–0.0516	0.158	–0.103	0.0780
	(0.210)	(0.343)	(0.177)	(0.647)	(0.312)	(0.289)
Inflation			0.00423	0.00503*	0.00452	0.00520*
			(1.696)	(2.056)	(1.602)	(1.905)
Inflation Squared			–2.98e–06	–3.46e–06	–2.61e–06	–3.04e–06
			(1.066)	(1.234)	(0.827)	(0.972)
Constant	7.078***	6.841***	6.252***	5.932***	5.530***	5.276***
	(4.609)	(4.368)	(4.040)	(3.834)	(3.203)	(3.096)
Observations	604	585	585	585	585	585
R-squared	0.630	0.604	0.659	0.635	0.544	0.527
Number of country	35	35	35	35	35	35

Absolute value of t-statistics are in parentheses below coefficient estimates. * significant at 10%; ** significant at 5%; *** significant at 1%. [1] Import duties over imports. [2] Argentina, Australia, Austria-Hungary, Brazil, Burma, Canada, Ceylon, Chile, China, Colombia, Cuba, Denmark, Egypt, France, Germany, Greece, India, Indonesia, Italy, Japan, Mexico, New Zealand, Norway, Peru, Philippines, Portugal, Russia, Serbia, Siam, Spain, Sweden, Turkey, United Kingdom, United States, and Uruguay. [3] In 1990 US$. [4] Index of average tariff levels in top 5 trading partners weighted by exports going to that partner. [5] Product of average physical distance to top 5 trading partners (principal city to principal city) weighted by exports going to that country, and transportation cost index. [6] Miles of railway trunk line in country. [7] Fraction of the population below the age of 15 that is enrolled in primary school. [8] Fraction of the population living in agglomerations of greater than 50,000 people. [9] Indicator variable taking the value 1 if country has the freedom to set own tariff levels independently, or 0 if it does not.

Table 6 Oaxaca-Blinder decomposition of ln(own tariff), Latin America and Asia

	1870-1913 and 1919-1938	1870-1913	1919-1938	1931-1938
ln (own tariff)$_{\text{Lat. Am.}}$ – ln (own tariff)$_{\text{Asia}}$	1.040	1.375	0.537	0.161
Standard error of difference	0.035	0.036	0.062	0.083
Three-fold decomposition				
Regressor values	0.764***	0.980***	0.010	–0.342
	(0.077)	(0.098)	(0.188)	(0.218)
Coefficients	0.471***	0.461***	0.578***	0.067
	(0.113)	(0.156)	(0.145)	(0.217)
Interaction	–0.195	–0.066	–0.051	0.436
	(0.132)	(0.181)	(0.229)	(0.298)
N in Latin America	476	286	151	72
N in Asia	525	359	166	70
N total	1,001	645	317	142

Note: Regressors are the same as in Table 5, column 3; *** p<0.01, ** p<0.05, * p<0.1

Table 7 Regional Summary of Tariff Levels, 1870-1913

Latin America[1]

	Mean	Std. Dev.	Min	Max	Observations
overall	27.0	8.76	9.7	58.2	N = 341
between		6.84			Groups = 8
within		6.04			T = 43

Asia[2]

	Mean	Std. Dev.	Min	Max	Observations
overall	7.04	4.29	1.78	23.5	N = 440
between		3.43			Groups = 10
within		2.79			T = 44

East Asia[3]

	Mean	Std. Dev.	Min	Max	Observations
overall	6.70	4.80	1.78	23.5	N = 220
between		4.13			Groups = 5
within		3.05			T = 44

[1] Argentina, Brazil, Chile, Colombia, Cuba, Mexico, Peru, Uruguay. [2] Burma, China, Ceylon, Egypt, India, Indonesia, Japan, Philippines, Siam, Turkey. [3] China, Indonesia, Japan, Philippines, Siam.

Table 8 Average Tariff Levels by Period 1870-1938

	1870-1899	1900-1913	1919-1938
Argentina	26.1	23.4	18.0
Brazil	34.5	40.0	23.4
Chile	19.4	18.3	22.1
Colombia	33.5	47.4	29.3
Cuba	22.5	25.6	26.2
Mexico	16.6	21.9	21.2
Peru	32.4	23.2	16.3
Uruguay	29.7	33.3	19.6
China	3.2	3.3	11.3
Indonesia	4.9	5.2	10.0
Japan	6.2	7.7	5.9
Philippines	10.3	21.2	8.1
Siam	3.6	7.4	15.1
Burma	4.0	11.3	22.5
Ceylon	6.2	7.3	13.3
Egypt	11.0	14.2	26.3
India	3.4	4.7	17.3
Turkey	7.4	9.5	30.7

Tariffs are expressed as total import duties collected divided by total imports (%).

Figure 1

British tariffs vs. tariffs in the Empire

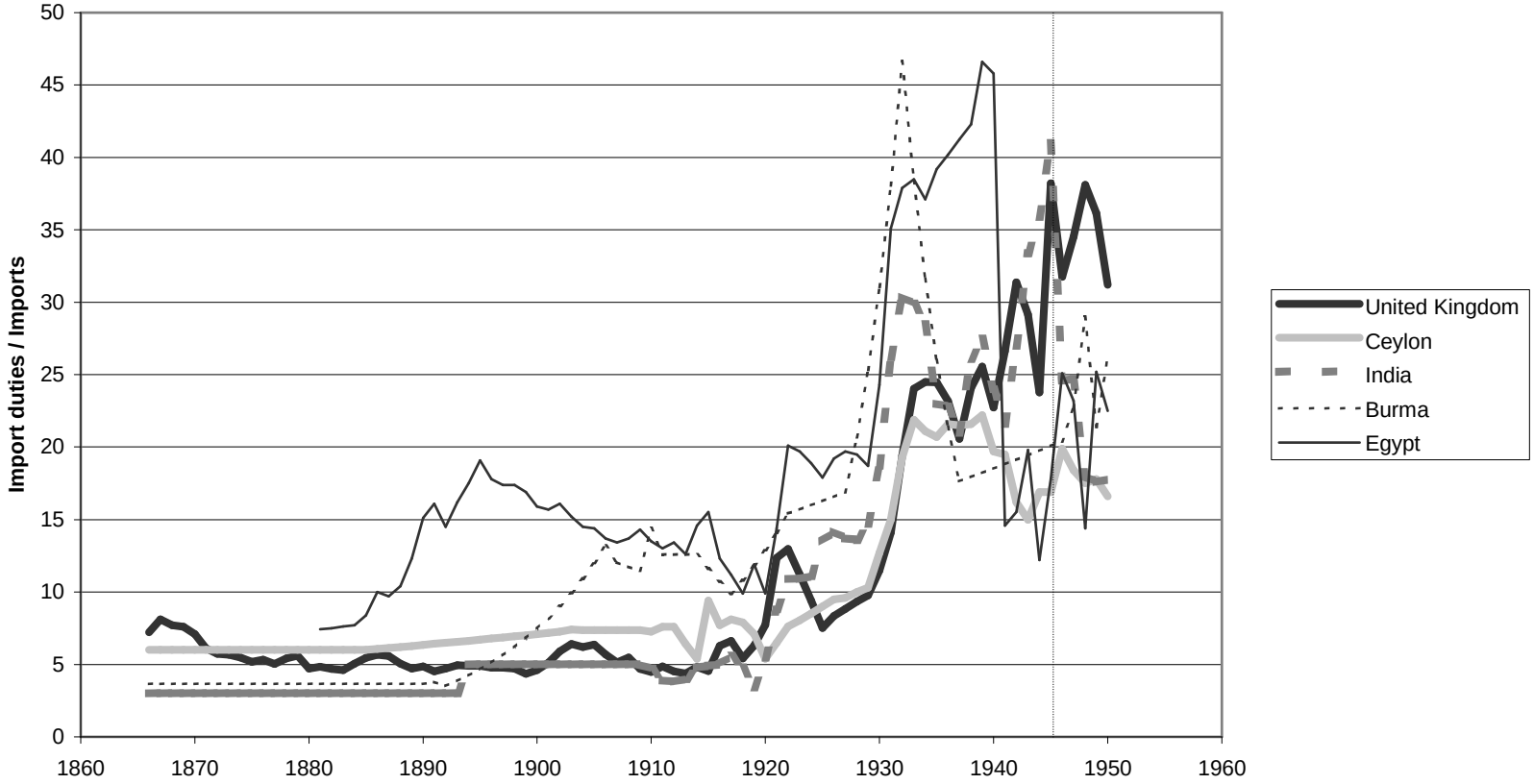


Figure 2

Filipino tariffs vs. Spanish and American tariffs

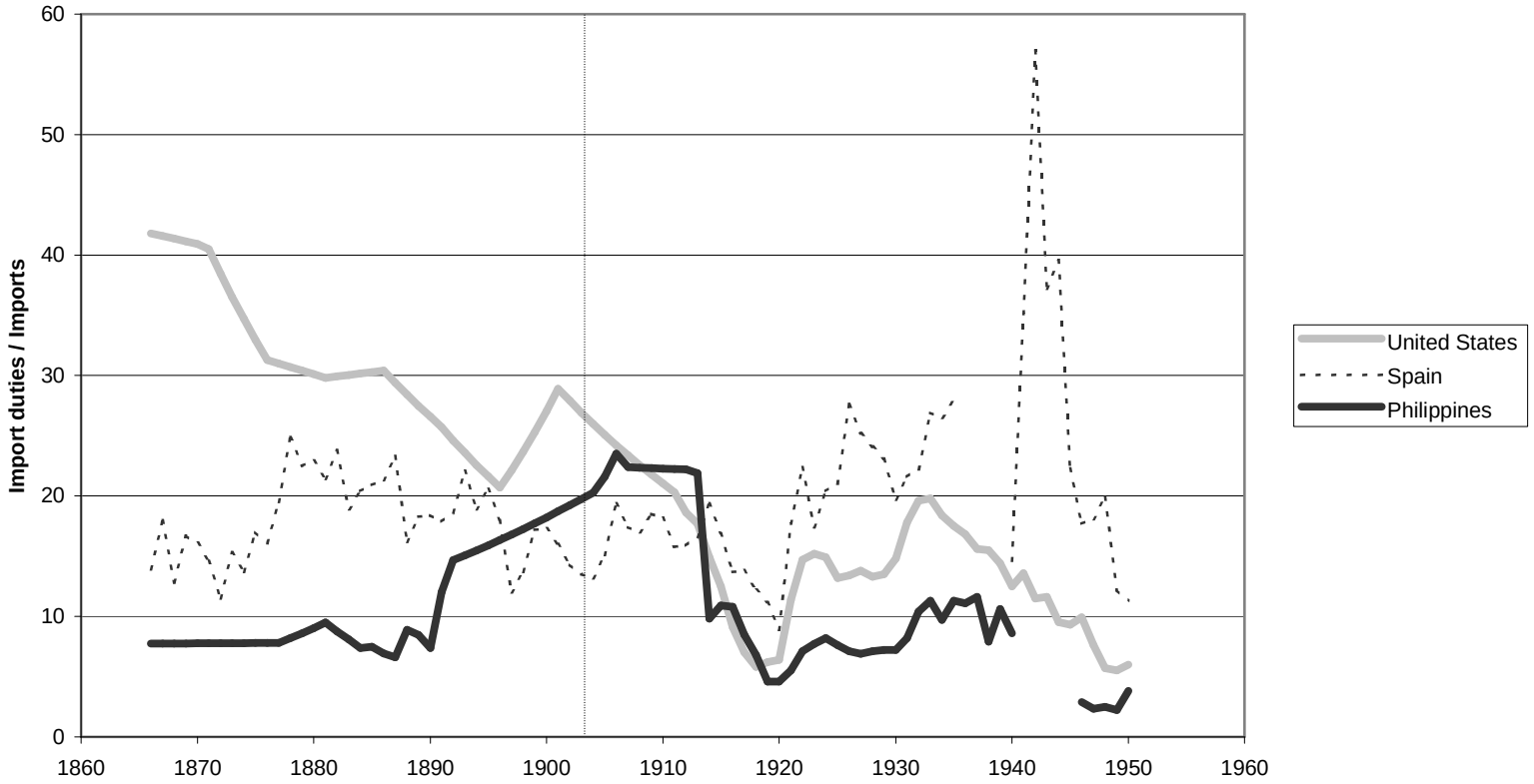


Figure 3

Average and standard deviation of tariff levels:
Colonies vs. Non-Colonies in Asia

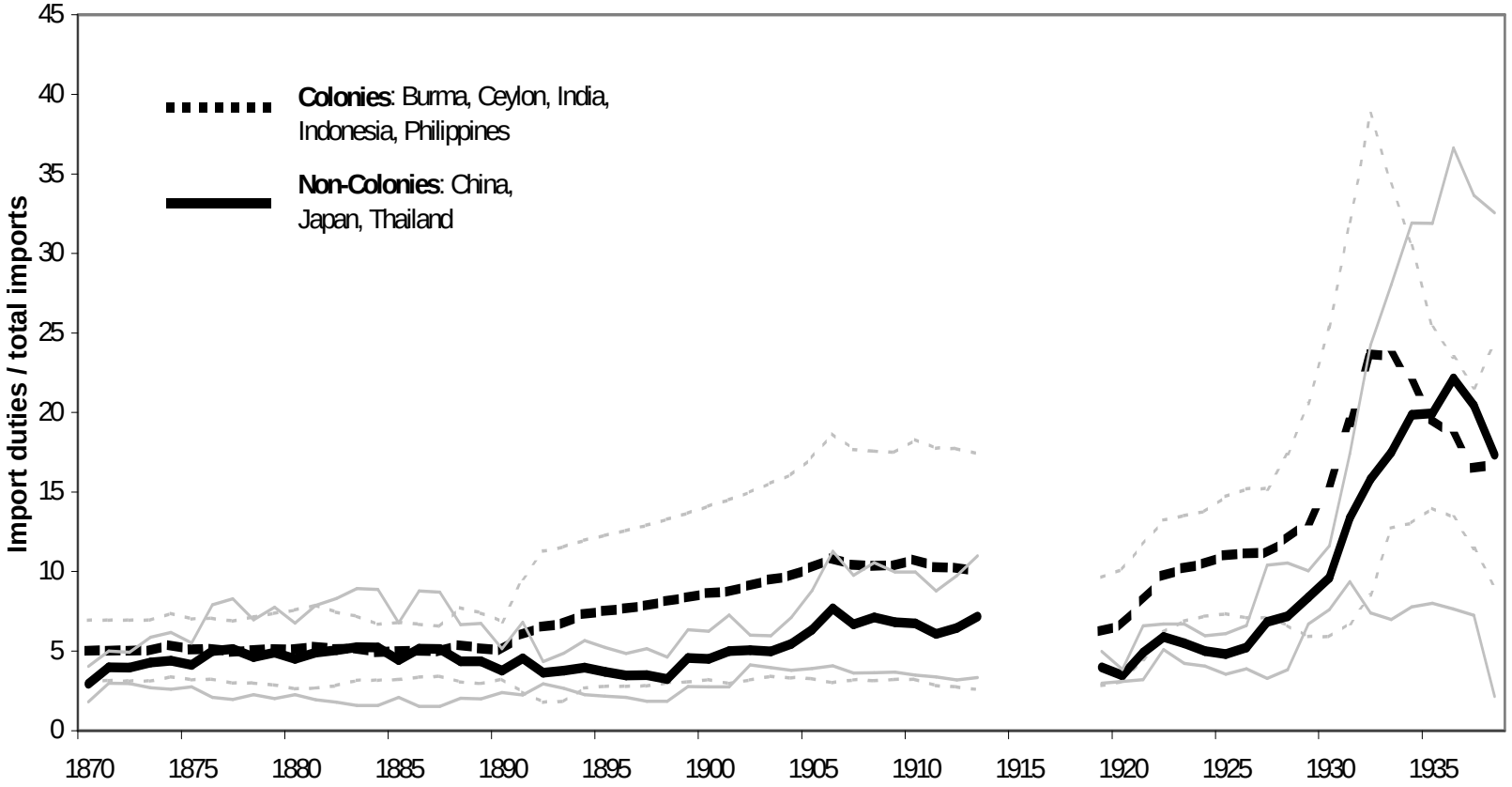


Figure 4

Regional average and standard deviation of tariff levels:
Latin America vs. Asia

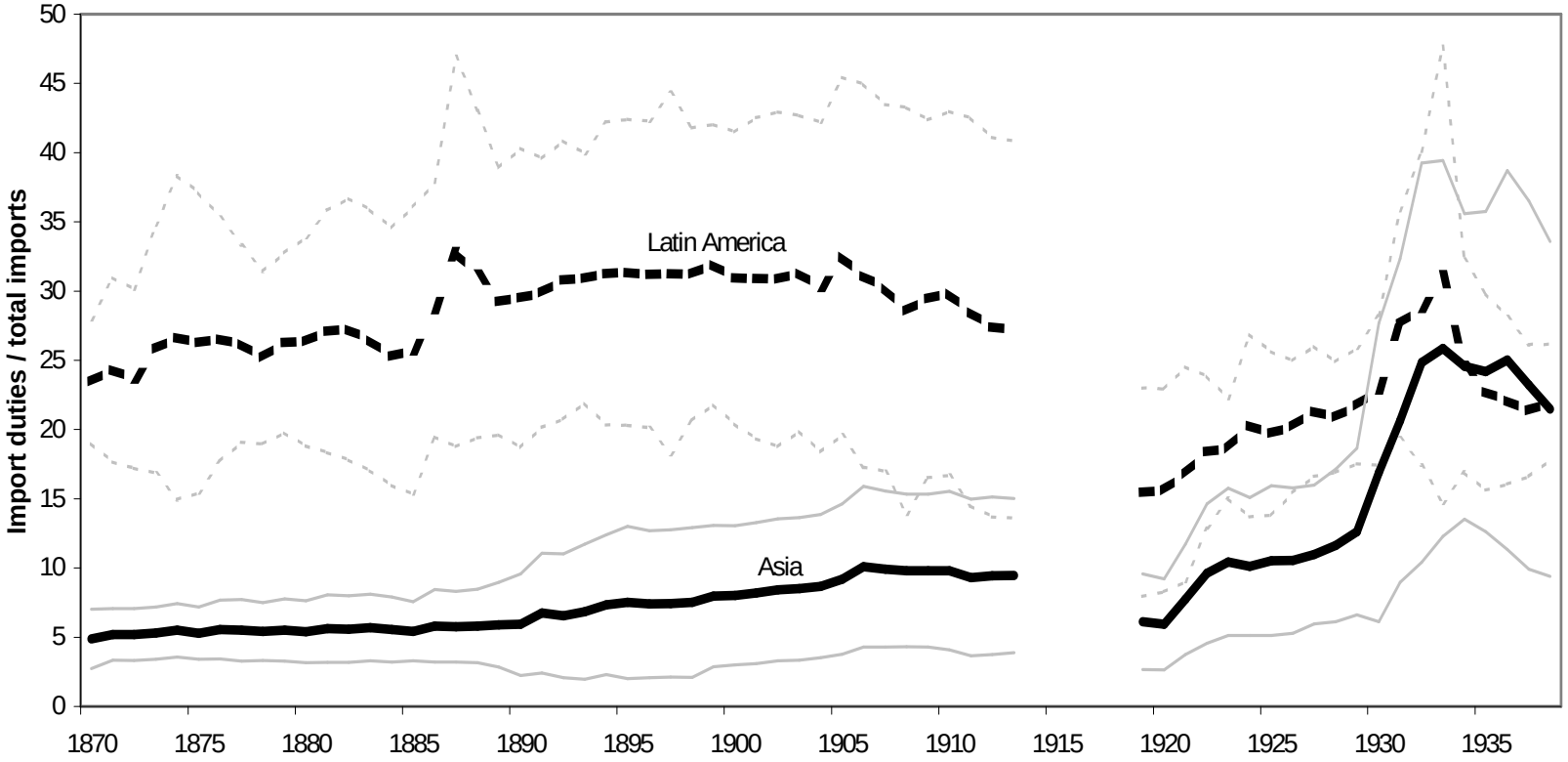


Figure 5 Tariff levels in Asia, 1870-1950

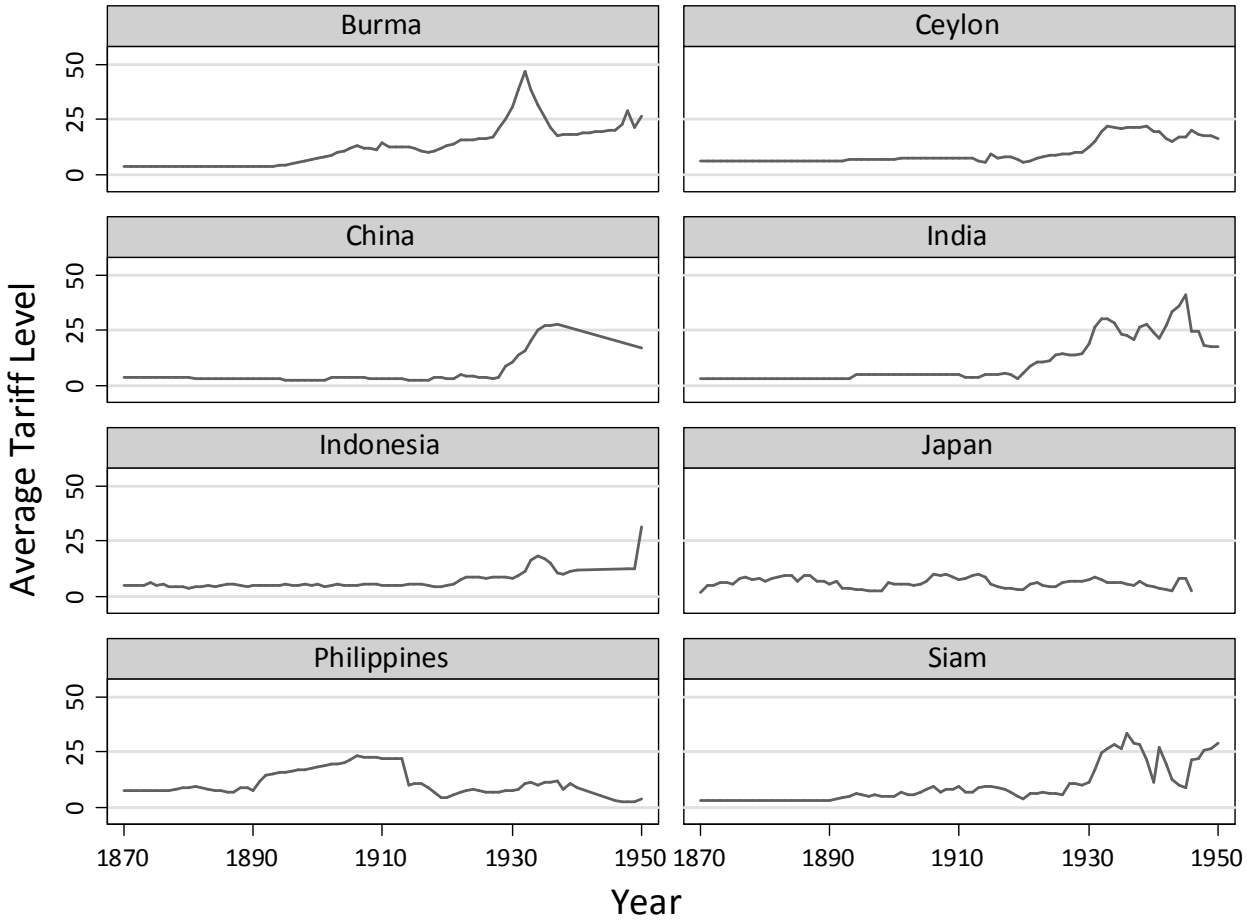


Figure 6

Regional average and standard deviation of GDP/capita:
Latin America vs. Asia

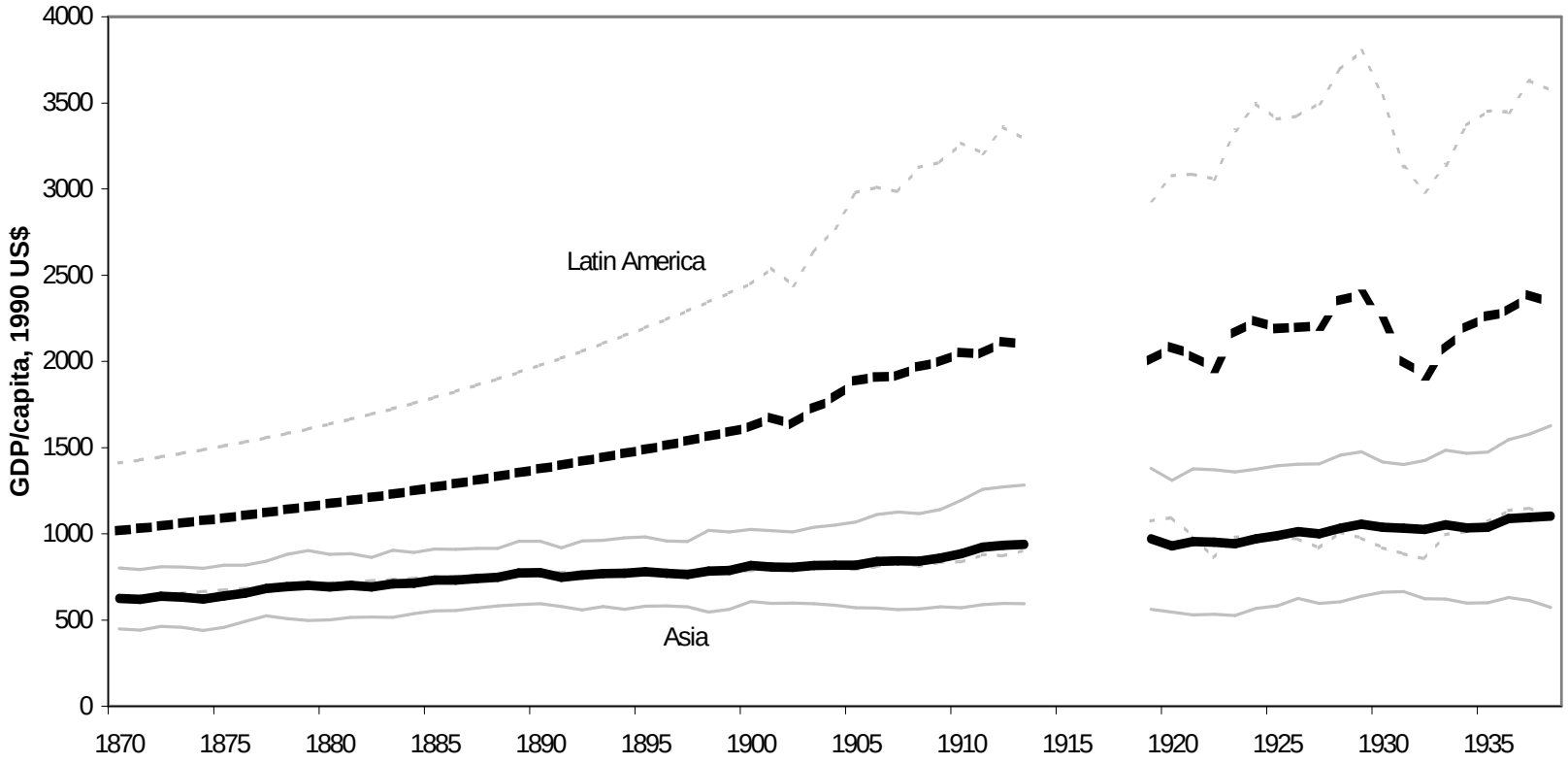
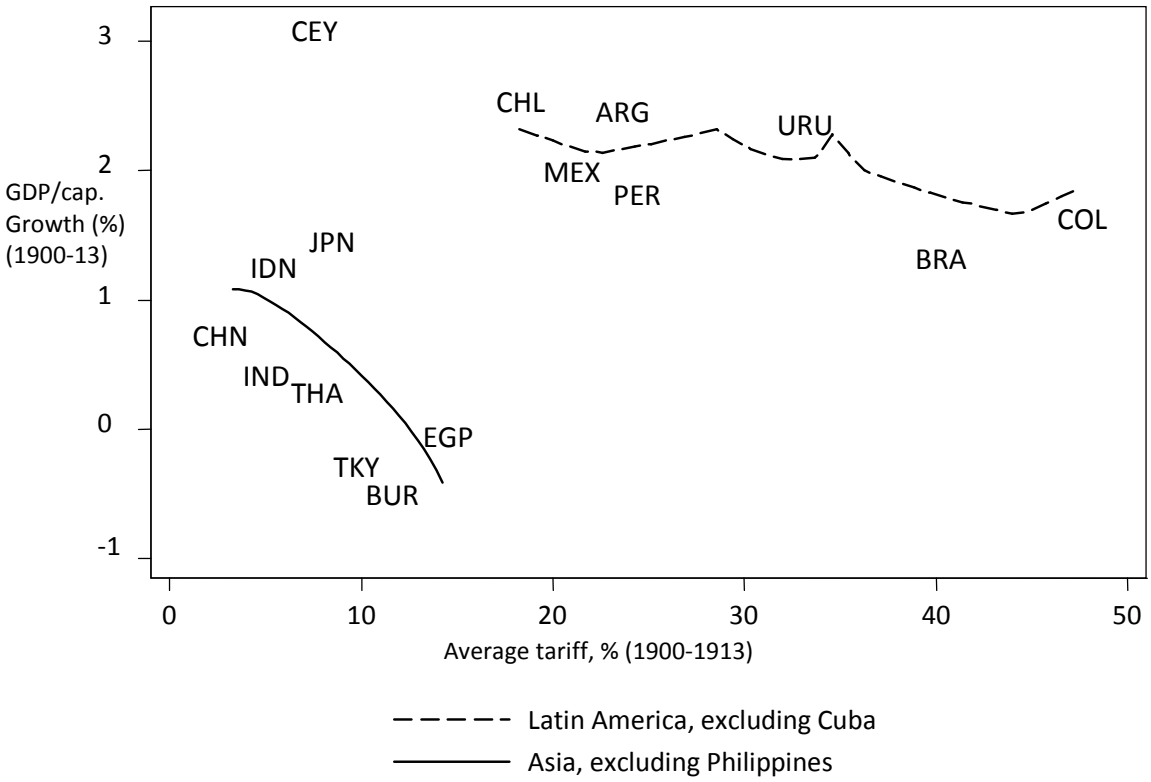


Figure 7 The Tariff-Growth Correlation in the Years Before World War I



Lines are linear polynomial fits, degree 1, bandwidth 5, Epanechnikov kernel.

Data Appendix for Endogenous Tariffs and Growth

Most data used in papers from the tariff project come from a novel database constructed by Chris Blattman, Ximena Clark, Michael A. Clemens, Martin Kanz, Istvan Zollei and others, under the guidance of Jeffrey G. Williamson (Department of Economics, Harvard University). The data base itself is called the BCW data file. This appendix offers a thorough description of sources and methods used in collecting these data, although much of the data herein have appeared in previous publications and more detailed descriptions of sources and methods are sometimes within these. Most data for the period 1870-1913 first appeared in Clemens and Williamson, "Where did British Foreign Capital Go?" *NBER Working Paper 8028*, National Bureau of Economic Research, Cambridge, Mass. (December 2000). Most data for the period 1914-1940 first appeared in Clemens and Williamson, "Why the Tariff-Growth Correlation Changed After 1950," *NBER Working Paper 8459*, National Bureau of Economic Research, Cambridge, Mass. (October 2001). Data for the eight Latin America countries, however, was greatly updated and expanded in John H. Coatsworth and Williamson, "The Roots of Latin American Protectionism: Looking Before the Great Depression," *NBER Working Paper 8999*, National Bureau of Economic Research, Cambridge, Mass. (June 2002). The terms of trade data were collected in Blattman and Jason Hwang, "The Terms of Trade Debate Revisited, Again," unpublished manuscript, Department of Economics, Harvard University (Summer 2002). Note that several sources are used frequently in all four aforementioned papers. They are: Arthur S. Banks, *Cross-National Time Series,1815-1973*, [Computer File] ICPSR ed. (Ann Arbor, Michigan: Inter-University Consortium for Political and Social Research, 1976), hereafter Banks (1976); Brian R. Mitchell, *International Historical Statistics, Europe, 1750-1988* (New York: Stockton Press, 1992); Brian R. Mitchell, *International Historical Statistics: The Americas, 1750-1988* (New York: Stockton Press, 1993); Brian R. Mitchell, *International Historical Statistics: Africa, Asia & Oceania, 1750-1993* (New York: Stockton Press, 1998); hereafter Mitchell.

Average Own Tariff Rates (or Total Import Duties over Imports)

Average tariff rates are calculated as the total revenue from import duties divided by the value of total imports in the same year. In some cases, the sources used do not distinguish

between import and export duties, and report total customs duties only. Total customs duties are used in the calculation of average tariff rates for countries where the value of export duties has historically been an insignificant share of total customs duties. Sometimes, the value of import duties collected is reported for fiscal years, while import data generally refer to calendar years. While making a consistent effort to compare calendar year duties to calendar year imports, in cases where calendar year duties figures are unavailable, fiscal year duties are divided by calendar year imports to calculate average tariff. (In these instances, fiscal year import duties are assumed to belong to the calendar year in which most of the fiscal year falls). Except where noted, missing data have not been interpolated.

***Argentina**:* Figures for Argentina 1865-1900 are from the *Anuario de la Dirección General de Estadística Correspondiente al Año 1900, Volume 1* (Buenos Aires: Compañía Sud-Americana de Billetes de Banco, 1901), p. 357, while figures for 1910-1913 come from the 1915 edition of the same publication (pp. 798 and 815). Average tariff figures for 1914-1930 are taken from Rosemary Thorp, "Economy, 1914-29," in Leslie Bethel, ed., *Latin America: Economics and Society 1870-1930* (Cambridge: Cambridge University Press, 1989), p. 77, Diagram: "Tariffs as a percentage of import value, 1910-30," hereafter Thorp (1989). Figures for 1931-1937 come from *Memoria de la Contaduria General de la Nacion, Volume 1* (Buenos Aires: Ministerio de Hacienda, various issues): 1931, p. 43; 1932, p. 115; 1934, p. 137; 1935, p. 159; 1937, p. 177. Import duties for 1933 and 1936 and import figures for 1931-1937 are taken from *El Comercio Exterior Argentino* (Buenos Aires: various issues): 1933, p. 57; 1937, p. 61. Data for 1938-40 are from the United Nations, S*tatistical Yearbook* (New York: Statistical Office of the United Nations, Department of Economic Affairs, 1951), hereafter United Nations (1951), with imports on pp. 364-88, and customs duties on pp. 474-520. The yearbook asserts that "wherever the distinction is of quantitative importance, customs duties are subdivided into import and export duties" (p. 472).

***Australia**:* Figures for 1870-1900 are given in Kevin H. O'Rourke, "Tariffs and Growth in the Late 19th Century," *The Economic Journal* 110 (April 2000): 456-83. Average tariff rates for 1901-1913 from Mitchell (1998). Beyond this date, customs import duties and total imports are reported in the *Official Year Book of the Commonwealth of*

Australia (Canberra: Commonwealth Bureau of Census and Statistics, Government Printer, various issues), 1915: p. 567, 1916: p. 595, 1917: p. 591, 1918: p. 616, 1919: p. 596, 1920: p. 616, 1921: p. 533, 1922: p. 502, 1927: p. 216 and 352, 1929: p. 227 and 350, 1933: p. 258, 1937: p. 520, 1941: p. 678. Import duties after 1930 include the so-called "primage duty" collected on Australian imports.

Austria: Figures for Austria-Hungary 1870-1913 are taken from Ludwig Lang, *Hundert Jahre Zollpolitik*, trans. Alexander Rosen, *Kaiserliche and Konigliche Hofbuchdruckerei and Hofverlagsbuchhandlung* (Wien and Leipzig: Carl Fromme, 1906), which we prefer to that reported by David F. Good, *The Economic Rise of the Habsburg Empire 1750-1914* (Berkeley, Cal.:University of California Press, 1984), p. 227. Figures for 1907-1913 and 1922-1937 are taken from Mitchell (1992).

Brazil*:* Figures before 1914 come from transcriptions of primary-source numbers for Brazilian imports, government income, and fraction of government income due to import duties in Laura Randall, *A Comparative Economic History of Latin America: 1500-1914, Volume 3: Brazil* (New York: Institute for Latin American Studies, Columbia University, 1977), pp. 219-49. Figures for 1914-1930 come from Thorp (1989), p. 77 (Diagram: "Tariffs as a percentage of import value, 1910-30"). For 1931-1936, import duties ("direitos de importacao para consumo") are taken from *Contadoria Central da Republica, Balanco Geral da Uniao, 1936* (Rio de Janeiro: Imprensa Nacional, 1937), p. 136, while the value of total imports are from *Comercio Exterior do Brazil, 1933-37* (Rio de Janeiro: Servico de Estadistica Economica E Financeira do Tresouro Nacional, Ministerio da Fazenda, 1938), p. 3. The ratio of "import taxes" and imports for 1937-1940 is calculated from A. K. Ludwig, *Brazil: A Handbook of Historical Statistics* (Boston: G.K. Hall & Co., 1985), p. 314 (imports) and p. 354 ("import taxes").

Burma: Imports are reported annually and customs duties for every fifth year in Teruko Saito and Lee Kin Kiong, *Statistics on the Burmese Economy* (Singapore: Institute of Southeast Asian Studies, 1999), p. 175 (imports) and p. 201 (customs duties). Thus, average tariff rates are calculated for every fifth year and the missing years are interpolated geometrically.

Canada*:* Figures for 1867-1913 come from Mitchell (1993). For 1914-40, figures are taken from M. C. Urquhart and K. A. H. Buckley, *Historical Statistics of Canada*

(Cambridge: Cambridge University Press, 1965), p. 173 (imports) and pp. 197-8 ("customs import duties").

***Ceylon**:* Figures for Ceylon 1902-1912 on import duties and imports come from the 1905 and 1914 editions of the *Ceylon Blue Book.* The 1902 figure is assumed to hold for 1870-1901 based on Batemen's contemporary report that the same rates seen in 1902 also prevailed in the years leading up to 1885 (A. E. Batemen, "Customs Tariffs," *Journal of the Statistical Society of London,* 48(4) (December 1885): pp. 617-27). Figures for 1925-1940 come from *Thirty Years of Trade Statistics of Ceylon (1925-54),* (Colombo: Department of Commerce, Part 1, 1955), p. 1 ("merchandise imports") and p. 2 ("customs duties on imports"). Average tariff rates for 1921 and 1922 are calculated using the *Annual General Report* (Colombo: Government Record Office, various issues), 1922: pp. 21-22 and 1923: p. 10. According to the figures in the *Annual General Report*, the value of export duties in Ceylon was almost exactly one third of the value of import duties in 1921-1923. Therefore, Ceylon's average tariff rate for 1914-1920 is estimated as follows: customs duties reported in Patrick Peebles, *A Handbook of Historical Statistics* (Boston: G.K. Hall & Co., 1982), pp. 236-7, are multiplied by : to get an estimated value of import duties; then the estimated import duties are divided by the value of merchandise imports given in the *Thirty Years of Trade Statistics of Ceylon* (1955), p. 1.

Chile: Jose Diaz and Gert Wagner, "Importaciones, Aranceles y Otros Instrumentos de Politica Comercial. Antecedentes Siglos XIX y XX," *Documento de Trabajo del Instituto de Economia de la Pontificia Universidad Catolica de Chile, No. 223,* Santiago (2002).

China: The treaties of Nanking (1843) and Tientsin (1858), as well as other similar treaties, limited the Chinese *ad valorem* tariff rate on imports from essentially all of Europe to 5%. However, the treaties (and their revisions in 1870, 1902, 1917, and 1922) did not set *ad valorem* tariffs. Rather, they set specific nominal duties that, although initially equivalent to a 5% *ad valorem* tariff, rapidly declined in effective value as prices rose (C. F. Remer, *The Foreign Trade of China,* Shanghai: The Commercial Press Ltd., 1926, pp. 171-81). "The average effective rates were often below three percent and were never above four percent even in the years immediately following the revisions" (Yu-Kwei Cheng, *Foreign Trade and Industrial Development of China,* Seattle, Wash.: The University Press, 1956, pp. 8-13). For this reason it is assumed that import-duties-over-

imports for China started at 4% in each year and declined at a constant rate to 2.5% in the year immediately preceding the next revision (Clemens and Williamson 2000). Due to China's joining World War I, one such tariff revision took place in 1918. "But that revision proved inadequate since the yield at the time of the Washington Conference of 1921-1922 was estimated at only about 3 per cent. The Conference agreed to immediate revision to an effective 5 per cent" (Arthur N. Young, *China's Nation-Building Effort, 1927-37*, Stanford, Cal.: Hoover Institution Press, 1971, p. 18). Finally, through negotiations the Nationalist government obtained tariff autonomy by 1929, which changed Chinese tariffs greatly. Young (1971) reports imports (pp. 492-3) and import duties (p. 52) for the period 1927-1937. The average tariff rates take account of Manchuria's foreign trade until 1931.

Colombia*:* Jos Antonio Ocampo and Santiago Montenegro, *Crisis mundial proteccion e industrializacion: ensayos de historia economica colombiana* (Bogat◁: CEREC, 1984).

Cuba*:* "On February 10, 1818, freedom of trade was decreed. But the customs tariffs established in that connection were ferociously protective of Spanish commerce and ships with tariffs ranging from 20% to 36% ad valorem. This system lasted through the nineteenth century with occasional changes to increase protection against foreign products" (Julio Le Riverend, *Economic History of Cuba*, Havana: Ensayo Book Institute, 1967, p. 177). A benchmark of import duties and imports from 1840 comes from *Cuadro Analítico del Comercio, Navegación y Rentas de la Isla de Cuba en el Año de 1840* (Havana: Imprenta del Comercio, 1841), pp. 12 and 16, and is assumed to hold constant until 1882. Various authors support such an assumption, describing how trade policy changed little until the revenue-neutral shift of tariffs away from Spanish goods and towards the produce of other nations began in 1882 (e.g. Fidel G. Pierra, *Spanish Misrule in America,* Washington: Cuban Delegation in the United States, 1896, p. 30 and Enrique José Varona, *Cuba vs. Spain,* 1917, p. 15). Customhouse revenue in 1895 is quoted from *The Cuban Question in Its True Light* (1896), p. 25, and imports for that year from Gonzalo De Quesada, *Cuba* (Washington: International Bureau of the American Republics, Government Printing Office, 1905), p. 154. Import duties and imports for 1905-1914 come from *Comercio Exterior, Segundo Semestre de 1914*, (Havana: Sección de Estadística, Secretaria de Hacienda, República de Cuba, 1915), pp. XII-XIV. The

import-duties-over-imports figure for 1895 is assumed to hold until the Treaty of Paris in 1898, from which time through 1904 the 1905 figure is assumed to hold. Figures for 1928-40 are taken from S. Schroeder, *Cuba: A Handbook of Historical Statistics* (Boston: G.K. Hall & Co., 1982), p. 470.

Denmark: Figures for 1865-1913 come from Mitchell (1992). Figures for 1914-40 are taken from Hans Chr. Johansen, *Dansk Historisk Statistik (Danish Historical Statistics), 1814-1980* (Copenhagen: Gyldendal, 1985), where total merchandise imports ("samlet vareindforsel", pp. 196-7) and customs duties ("told", pp. 327 and 330) are reported.

Egypt: Figures for 1885-1935 are taken from the *Annual Statement of the Foreign Trade of Egypt* (Cairo: Statistical Department, Ministry of Finance, 1935), where "duty collected on imports" (of merchandise) is given on p. 6. The 1885 figure is assumed to hold on 1882-1884. Before the 1882 British occupation, the figure for Turkey is used. Figures for 1938-1940 are from the United Nations S*tatistical Yearbook* (1951). Figures for the period 1936-1937 are obtained through geometric interpolation.

France: Figures for 1865-1913 are from Mitchell (1992). Figures for 1914-1940 are taken from the *Annauire Statistique* (Paris: Ministere des Finances et de Affaires Economiques, Impremerie Nationale, 1951), which reports total imports (pp. 190-1) and import duties ("droits d'importation", p. 321).

Germany: Figures for 1880-1940 come from Mitchell (1992). Nonetheless, the following sources were also used to convince ourselves of the validity of the Mitchell figures: *Deutsche Wirtschaftskunde* (Berlin: Statistischen Reichsamt, Verlag von Reimer, Hobbing, 1933), pp. 119, 316, 336; Otto Nathan, *The Nazi Economic System* (Durham, North Carolina: Duke University Press, 1944), p. 320; *Statistisches Jahresbuch für das Deutsche Reich* (Berlin: Statistisches Reichsamt, various issues). Since the fragmented data in these sources on imports ("Einfuhr") and customs import duties ("Zölle" or "Zollerträge") match the figures in Mitchell (1992), the latter was used 1880-1940 for continuity.

Greece: Figures on import duties and imports for Greece, 1887-1897 come from *Commerce de la Grèce avec les Pays Étrangers pendant l'Année 1900* (Athens : Imprimerie Nationale, 1901), p. 5, and figures for 1898-1910 from *Statistique du Commerce Special de la Grèce avec les Pays Étrangers pendant l'Année 1909* (Athens :

Bureau de Statistique du Ministère des Finances, Imprimerie Nationale, 1911), pp. 2 and 40 (as well as the same pages of the 1912 edition). A single datapoint for 1868 is available in Demetrius Bikelas, "Statistics of the Kingdom of Greece," *Journal of the Royal Statistical Society*, 31(3) (September 1868), pp. 265-98. When, then, during the period 1869-1886 did Greece make the transition from low tariffs to protective tariffs? Writing in 1878, Newmarch divides the countries of the world into five groups, according to "the degree in which the Tariffs of the respective groups are hostile to the admission of exports sent from the United Kingdom" (William Newmarch, "On the Progress of the Foreign Trade of the United Kingdom since 1856, with Especial Reference to the Effects Produced Upon it by the Protectionist Tariffs of Other Countries," *Journal of the Royal Statistical Society*, 41(2) (June 1878), p. 200). Greece figures in the "most hostile" group. Thus it is assumed that the protective tariff levels calculated for 1887 had already arrived in 1877, and the years 1869-1876 are interpolated geometrically. Figures for 1911-1939 are taken from *Statistique du Commerce de La Grece avec Les Pays Etranges, Volume I* (Athens: Impremerie Nationale, 1939), which gives imports (p. 4) and import duties ("droits d'importacion," p. 31).

India: For the period before 1910, we employ Rider's observation that India affected a "departure from free trade" in 1894 with the imposition of a "5 percent ad valorem duty on all imports except cotton goods and a list of raw materials and machinery used in major Indian industries." With a few modifications, including a change that removed the cotton exemption, this arrangement survived "until the war" (Thomas Rider, "The Tariff Policy of the Government of India and Industrial Development," *Journal of Economic History*, 30(1) (March 1970), p. 278). Figures for 1910-1934 come from *the Statistical Abstract of British India* (London: His Majesty's Stationery Office, various issues), 1910-1920: pp. 62 and 152-3, 1920-1930: pp. 212-4 and 534-5, 1926-1936: pp. 404-6 and 824-5. In this source, duties on imports by sea and total imports by sea are reported. The use of sea trade data to calculate average tariff levels seems justified given that customs revenues from land trade represented only about 0.5% of the customs duties on sea trade, and land imports were well under 10% of sea-borne imports. Figures for 1935-1940 are from the *Review of the Trade of India* (Delhi: Department of Commercial Intelligence

and Statistics, various issues), 1936-1937: pp. 32 and 263, 1937-1938: pp. 78 and 277, 1940-1941: pp. 101 and 249.

Indonesia: Figures for 1870-1939 are from W. L. Korthals Altes, *Changing Economy in Indonesia: Volume 12a, General Trade Statistics 1822-1940* (Amsterdam: Royal Tropical Institute, 1991), pp. 54-6 (imports) and pp. 187-8 (import duties). Figures for 1940 are taken from the *Statistical Pocket Book of Indonesia* (Jakarta: Biro Pusat Statistik, 1957), p. 99 (imports) and p. 173 (import duties).

Italy: Figures for 1865-1913 are from Mitchell (1992). For 1914-1940, the data come from Thelma Liesner, *One Hundred Years of Economic Statistics* (New York: Facts on File, 1989), pp. 244-7.

Japan: Figures for 1865-1891 are from Mitchell (1998). Figures for 1892-1940 are taken from *Japan Statistical Yearbook* (Tokyo: Sorifu, Tokeikyoku, 1949), p. 471. Figures for 1866, and 1893-1896 are obtained through geometric interpolation.

Mexico*:* For Mexico, import duties for 1886-1891 come from Antonio Peñafiel, *Boletín Semestral de la Dirección General de Estadística de la República Mexicana* (Mexico City: Ministerio de Fomento, 1892), p. 154. Imports from this same period come from Banks (1976), converted to pesos using Taylor (2000). Import duties and imports for 1894-1910 come from the *Boletín de Estadística Fiscal* (Mexco City: Palacio Nacional), pp. 63, 139, 146-7, and 173, except imports 1894-96 which come from Banks (1976) converted as before by Taylor (2000) and the assumption that on 1906-1910, the fraction of total customs revenue represented by import duties was equal to the average of what that fraction had been during 1894-1906. Tariffs during 1892-1893 are assumed to equal 1894 levels, but since Porfirio Díaz reformed the tariffs in 1891, we cannot assume continuity from 1891 to 1892 (Graciela Márquez, "Tariff Protection in Mexico, 1892-1909: Ad Valorem Tariff Rates and Sources of Variation," in John H. Coatsworth and Alan M. Taylor, eds., *Latin America and the World Economy since 1800*, Cambridge, Mass.: Harvard University Press, 1998, p. 435). A benchmark for import duties in 1871 is found in *Exposición que el Ejectutivo Federal Dirige al Congreso de la Unión, Dando Cuenta del Uso que Ha Hecho de las Facultades que le Concedio el Artículo 3º de la Ley de 1º Diciembre de 1871, y del Estado que Guarda la Hacienda Federal en 1º de Abril de 1872* (Mexico City: Imprenta del Gobierno, en Palacio, 1872), p. 458. This is combined

with imports from Banks (1976) converted by Taylor (2000). Figures from 1872-1885 are interpolated geometrically, guided by the 1844, 1865, and 1872 benchmarks for import duties given in Walter Flavius McCaleb, *The Public Finances of Mexico* (New York: Harper & Brothers Publishers, 1921), pp. 89, 121-2, and 134. Figures for 1925-1937 come from the *Anuario Estadistico* (Mexico City: Estados Unidos Mexicanos Secretario de la Economia Nacional Direccion General de Estadistica, various issues), reporting Mexican import duties ("impuestos a la importation"in: 1930, p. 517; 1938, pp. 280-1; 1940, p.741) and imports (in 1938, p. 247 and 1940, p. 654). Figures for 1938-1940 are from the United Nations (1951). Figures for the extended civil war period, 1913-1924, are estimated through geometric interpolation.

New Zealand: Figures are taken from the *Official Year Book of New Zealand* (Wellington: Government Printer, various issues), including 1894: p. 132 and endsheet, 1928: p. 341, 1932: p. 281, 1935: p. 233, 1938: p. 270, 1941: p. 249. Figures for 1865-1885 were estimated by assuming that tariff revenue represented the same average fraction of total tax revenue during 1865-1885 as it did 1886-1892 (i.e. roughly 70%). The assumption is justified by the facts that this fraction was essentially constant between 1886 and 1892, and that this fraction was also roughly 70% in 1851-1852 (endsheet of the 1894 edition of the *Official Year Book* has figures for 1851-1852).

Norway: Figures for 1865-1940 are from Mitchell (1992). The *Historisk Statistikk* (Oslo: Central Bureau of Statistics of Norway, 1978), pp. 261 and 446, was also used to check the validity of Mitchell's data.

Peru*:* Primary sources for Peru 1866-1878 and 1883-1913 are directly quoted in Laura Randall, *A Comparative Economic History of Latin America: 1500-1914. Volume 4: Peru*, (New York: Institute for Latin American Studies, Columbia University, 1977), pp. 205-6. The period 1879-1882 is interpolated geometrically. Figures for 1914-1930 come from Thorp (1989), p. 77 (Diagram: "Tariffs as a percentage of import value, 1910-30"). Figures for 1931-37 are taken from the *Extracto Estadistico del Peru* (Lima: Preparado por la Direccion Nacional de Estadistica, 1938) reporting customs duties ("impuestas aduanas," p. 402) and total imports (p. 212). Data for 1938-40 are from the United Nations (1951).

The Philippines: Import duties over imports for the Philippines from 1867-1892 are taken from the *Estadística Mercantil del Comercio Exterior de las Islas Filipinas* (1867, 1876) and the *Estadística General del Comercio Exterior de las Islas Filipinas* (1881, 1885, 1893). For the periods 1904-1907 and 1912-1914 statistics are available in H. B. McCoy, *Annual Report of the Bureau of Customs for the Fiscal Year Ending June 30, 1907* (Manila: Bureau of Printing, 1907), pp. 50-3 and *Foreign Commerce of the Philippine Islands, January-December 1914, July-December 1913* (Manila: Bureau of Customs, Department of Finance and Justice, Government of the Philippine Islands, Bureau of Printing, 1914), p. 138. Since protection under the Spanish doubled between 1890 and 1892 (from 7.4% to 14.7%), it is not clear how to fill in the missing years 1893-1903. Since it appears that protection was still rising between 1904 and 1907 (from 20.3% to 22.4%), it is assumed that it rose shallowly and slowly during the missing period; that is, the missing years are interpolated geometrically. Figures for 1914-1940 come from the *Annual Report of the Insular Collector of Customs* (Manila: Bureau of Printing, 1937 and 1940), where import duties (1940: pp. 359-60) and imports (1937: pp. 66-7, 1940: p. 15) are presented.

Portugal: Average tariff levels 1870-1950 are taken from Joao Luis Cesar das Neves, *The Portuguese Economy: A Picture in Figures* (Lisbon: Universidade Catolica Editora, 1994). The graph on p. 149 illustrates "Import Tax/Import" values for Portugal for the period 1836-1990.

Russia: Figures for Russia preceding World War I are in Forrest Capie, "Tariff Protection and Economic Performance in the Nineteenth Century," reprinted in C. Knick Harley, ed. *The integration of the world economy, 1850-1914, Volume 1*, Elgar Reference Collection: Growth of the World Economy Series, Vol. 3. (Cheltenham, U.K: 1996), pp. 303-4. Customs revenue to the central government of the Soviet Union and total imports from all international borders, 1924-28, are taken from the *Statisticheskii Spravochnik SSSR* (*USSR Statistical Handbook) 1928* (Moscow: Central Statistical Agency, 1928*)*, *Soiuz SSR TSentral'noe Statisticheskoe Upravlenie* (Moscow: Central Statistical Agency, 1929), pp. 570, 713.

Yugoslavia (Serbia): A detailed, year-by-year account of Serbian import duties preceding World War 1 is found in Ivan Z. Nestorović, *Der Aussenhandel Serbiens* (Leipzig:

Verlag von Veit & Co., 1913), pp. 6-43. Tariff figures after 1913 are taken from W. S. Woytinsky and E. S. Woytinsky, *World Commerce and Governments - Trends and Outlook* (New York: The Twentieth Century Fund, 1955), p. 277, for benchmark years between 1913-1931. However, it has been noted that the average tariff levels in this source most likely refer to import-duties-over-dutiable-imports ratios, and thus are consistently higher than what other sources suggest. Therefore, Yugoslav tariff rates given in Woytinsky and Woytinksy (1955) have been altered: the benchmark values were converted to import-duties-over-total-imports estimates. The sum of tariff levels for Austria, France, Germany, Italy, Spain, and Sweden given in Woytinksy and Woytinsky (1955) in each benchmark year was divided by the sum of tariff levels for the same countries and years found in other sources (cited in this Data Appendix for each of the countries). Then, the Yugoslav tariff rates reported in Woytinksy and Woytinsky (1955) were divided by this ratio, in order to estimate Yugoslav import-duties-over-total-imports. Missing years have been geometrically interpolated. Also, it has been noted that the Serbian tariff level estimates used in Clemens and Williamson (2000) also refer to import-duties-over-dutiable-imports. Therefore, the Clemens and Williamson Serbian tariff figures for 1865-1913 were linked to the tariff levels calculated above for 1913-1931, yielding an estimate for Serbian import-duties-over-total-imports ratios for 1865-1913.

Spain: Figures for 1865-1940 come from two sources: imports are taken from Leandro Prados de la Escosura, *El Progreso economico de Espana, 1850-2000* (Madrid: 2002), while "tariff revenue" is taken from F. Comin, *Fuentes cuantitativas para el estudio del sector publico en Espana* (Madrid: 1985).

Sweden: Average tariff figures for 1865-1910 are from Mitchell (1992). Figures for 1911-1940 are taken from *Handel* (Stockholm: Sveriges Officiella Statistik, various issues), where customs duties as a percentage of imports ("Tulluppbörd i % av införseln") are given in various issues (1917: p. 34, 1926: p. 28, 1936: p. 32, 1945: p. 37, 1951: p. 34).

Thailand: Thai customs revenue 1894-1913 and Ticul-denominated imports 1907-1913 are in the *Statistical Year Book of the Kingdom of Siam 1917*, English edition (Bangkok: Department of Commerce and Statistics, Ministry of Finance, 1917), pp. 36 and 127.

Imports for 1894-1906 are taken from Banks (1976) and converted using Taylor (2000). Between 1865 and 1890 treaties with all the major powers kept import duties below 3% (James C. Ingram, *Economic Change in Thailand 1850-1970*, Stanford University Press, Stanford, California, 1971, pp. 34-5). Geometrical interpolation between 1890 and 1894 produces a rapid doubling of tariff rates on this period, consistent with the record that the Thai government began in 1890 to revise the earlier treaties and increase its tariff revenue (ibid., p. 138). Figures for 1914-1940 are taken from Constance M. Wilson, *Thailand: A Handbook of Historical Statistics* (Boston: G.K. Hall & Co., 1983), pp. 210-1 (imports) and pp. 242-4 (customs duties).

Turkey: Statistics on import duties for Turkey after 1878 are found in Justin McCarthy, *The Arab World, Turkey, and The Balkans (1878-1914): A Handbook of Historical Statistics* (Boston: G. K. Hall & Co., 1982), pp. 230-1. The stability of the tariff rate observed during all of 1878-1900 is assumed to hold true during 1870-1877 as well. Figures for 1923-1940 come from the *Annuaire Statistique* (Ankara: Republique Turque, Office Central De Statistique, various issues), which report imports (1928: pp. 103-6, 1932-1933: p. 250, 1938-1939: p. 231, 1948: p. 396, 1951: p. 357) and import taxes ("taxes douanieres," i.e. "gümrük resmi," 1928: pp. 156-7, 1930: p. 310, 1932-1933: p. 302, 1938-1939: pp. 276-7, 1942-1945: p. 385, 1948: p. 434, 1950: p. 245, 1951: p. 324).

United Kingdom: Figures for 1865-1940 are taken from Brian R. Mitchell, *British Historical Statistics* (Cambridge: Cambridge University Press, 1988), where imports (p. 453) and customs revenue (pp. 582-4) are reported annually.

United States*:* Figures for United States are given in Kevin H. O'Rourke, "Tariffs and Growth in the Late 19th Century," *Economic Journal*, 110 (April 2000), pp. 456-83.

Uruguay*:* Figures for Uruguay, 1882-1911, are taken from the *Anuario Estadístico de la República Oriental del Uruguay 1886* (Montevideo: Tipografia Oriental, Montevideo, 1887), unnumbered page, and Julio M. Llamas, *Anuario Estadístico de la República Oriental del Uruguay, Años 1911 y 1912* (Montevideo: Tipografía Moderna, 1915), pp. 91 and 573. Before 1882 it is assumed that Uruguayan tariff rates mirror those of Argentina. This is justified for three reasons: Argentine and Uruguayan tariff rates were nearly identical during 1882-1890, and Uruguay was under the same military rule during this period as it was during the 1870s; this military government had close ties to the

Argentine government, with which it had fought against Paraguay 1865-1870; and at the onset of civilian rule in Uruguay in 1890, tariff rates spiked upwards. Figures for 1913-1940 are taken from *Anuario Estadistico* (Montevideo: Ministerio de Hacienda, Direccion General de Estadistica y Censos, various issues), where import duties ("derechos de aduana s. importacion") and imports are reported annually. Tariff figures for two missing years, 1923 and 1939, are estimated by geometric interpolation.

Export Share of GDP

Export shares are calculated as the ratio of exports to gross domestic product, and the sources for the latter can be found in the section immediately following. The sources for exports are listed in this section.

Data for exports (in current US dollar equivalents) come from Banks (1976), except for Burma, Ceylon, Egypt, India, Indonesia, the Philippines, Portugal, and Uruguay. The export figures given in Banks in current US dollars are converted to 1990 US dollars using the American historical consumer price index in John McCusker, *How Much Is That in Real Money?* (Worcester, Mass.: American Antiquarian Society, 1992). Export data for the years 1914-1918 are obtained by geometric interpolation. Dividing these interpolated export figures by GDP gives the openness ratios for the war-time years. Export figures for Ceylon, Egypt, India, Indonesia, the Philippines and Uruguay are found in Mitchell (1998). The export figures given in current national currency units in Mitchell are converted to 1990 US dollars using the exchange rates in Taylor (2000) and the American historical consumer price index in McCusker (1992). Once converted to 1990 US dollars, the export data for India, Indonesia, and the Philippines are divided by Maddison's (1995) GDP estimates to get the openness variable. The calculation of Ceylon, Egypt, and Uruguay's per capita GDP has already been described. Per capita GDP figures for these three countries were multiplied by their population estimates to get GDP. Exports were then divided by these GDP levels to get the openness ratio of Ceylon, Egypt, and Uruguay. To calculate openness for Burma, we rely on Saito and Kiong (1999), who provide estimates of Burmese Net Domestic Product and exports in current rupees until 1938. For Portugal, export and GDP figures in current escudos are taken from das Neves (1994).

GDP and GDP per capita

The units on this variable are 1990 US dollars per inhabitant of any age.

GDP per capita estimates 1870-1950 for Australia, Brazil, Canada, China, Denmark, France, Germany, India, Indonesia, Italy, Japan, Mexico, New Zealand, Norway, Portugal, Russia, Spain, Sweden, Thailand, and the United States come from Angus Maddison, *Monitoring the World Economy, 1820-1992* (Paris: Development Center of the Organization for Economic Cooperation and Development, 1995). For countries not reported in Maddison, GDP per capita is calculated by dividing a country's income (in 1990 US dollars) by population in every year. Sources of the population data have been described elsewhere in this appendix, and the sources of the income estimates follow.

Data for Argentina after 1890 come from Maddison (1995). Before this date, GDP per capita is assumed to grow at the same year-on-year rate as the estimates of Argentine real wages found in Jeffrey G. Williamson, "The Evolution of Global Labor Markets since 1830: Background Evidence and Hypotheses," *Explorations in Economic History,* 32 (1995):141-96.

Data for Austria-Hungary after 1913 come from Maddison (1995). Data before 1914 come from David F. Good, "The Economic Lag of Central and Eastern Europe: Income Estimators for the Habsburg Successor States, 1870-1910," *Journal of Economic History* 54 (December 1994): 869-91. These are converted from 1980 to 1990 dollars using a GDP deflator obtained from the Bureau of Economic Analysis of the United States Department of Commerce (online at http://www.bea.doc.gov/bea/dn/gdplev.htm).

Data for Burma after 1900 come from Maddison (1995). Before this date it is assumed that Burmese growth mirrored that of India.

Ceylon presented the most difficult data challenge in this category, as we are not aware of any published figures for GDP in Ceylon during this period. Burnham O. Campbell, "Development Trends: A Comparative Analysis of the Asian Experience," in Naohiro Ogawa et al., eds., *Human Resources in Development along the Asia-Pacific Rim* (New York: Oxford University Press, 1993) has estimated that in 1914, GDP per capita in Ceylon was 1.95 times that of India. The same ratio had declined to 1.52 by 1948 according to United Nations *Statistical Yearbook 1949-50* (New York: 1950), pp. 21-2 and 406. In the intervening years, 1914-1948, it is assumed that the ratio declined

annually at a constant rate. Before 1914, it is assumed that real GDP per capita grew at the same rate as did the ratio of the real value of British colonial revenue from Ceylon to the population of the Island. A full series of annual nominal colonial revenues and population figures come from the 1905 and 1914 editions of the annual *Ceylon Blue Book*, a statistical publication of the colonial administration in Colombo. Some of these figures were recorded in rupees, and are converted to pounds sterling using conversion rates from Bryan Taylor, *Encyclopedia of Global Financial Markets* (Los Angeles: Global Financial Data, 2000), online at http://www.globalfindata.com. The resulting figures are converted to real pounds sterling using the deflator in John McCusker, *How Much Is That in Real Money* (Worcester, Mass.: American Antiquarian Society, 1992).

Data for Chile after 1900 come from Maddison (1995). Before this date it is assumed that Chile grew at the same year-on-year rate as did our estimates of Argentine GDP per capita.

Data for Colombia after 1900 come from Maddison (1995). Before this date, it is assumed that that GDP per capita grew at an unweighted average of the growth rates for Mexico and Brazil between 1850 and 1900 given in John H. Coatsworth, "Economic and Institutional Trajectories in Nineteenth-Century Latin America," in John H. Coatsworth and Alan M. Taylor, eds., *Latin America and the World Economy Since 1800* (Cambridge, Mass.:Harvard University Press, 1998).

Estimates for Cuba for 1850 and 1913 are based on estimates of Cuban GDP per capita relative to that of Mexico and Brazil presented in Coatsworth (1998). An unweighted average of the figures implied by Coatsworth's proportion of our estimates for Mexico and Brazil is calculated for both years, and the intervening years estimated by geometric interpolation. For the years 1914-1950, Cuba's Net National Product in current year pesos comes from Mitchell (1993). These NNP values are converted to 1990 US dollars with the help of the peso-dollar exchange rate given in Taylor (2000) and the American historical consumer price index given in McCusker (1992), pp. 300-2.

Before 1900 it is assumed that Egyptian GDP per capita grew at the same year-on-year rate as did estimates of Egyptian real wages from Jeffrey G. Williamson, "Real wages and relative factor prices around the Mediterranean, 1500-1940," in Şevket Pamuk and Jeffrey G. Williamson, eds. *The Mediterranean Response to Globalization Before 1950*

(New York: Routledge, 2000). For the years 1900-1950, a trend for Egyptian GDP per capita is calculated with the help of benchmark values given in Maddison (1995). Annual GDP per capita estimates are then calculated under the assumption that Egypt deviated from the Maddison-estimated Egyptian benchmark trend in the same way (percentage-wise) as Turkey did from her GDP per capita trend (after the civil war).

Data for Greece after 1913 come from Maddison (1995*).* Before this date, we assume the growth rate found in James Foreman-Peck and Pedro Lains, "European Economic Development: The Core and the Southern Periphery, 1870-1910," in Şevket Pamuk and Jeffrey G. Williamson, eds., *The Mediterranean Response to Globalization Before 1950* (New York: Routledge, 2000).

Data for Peru after 1900 come from Maddison (1995). Before this date it is assumed that Peru grew at the same year-on-year rate as did our estimates of Argentine GDP per capita.

Data for the Philippines after 1900 come from Maddison (1995). Before this date it is assumed that Philippine GDP per capita grew at the same year-on-year rate as our estimates for Thailand.

Estimates for Serbia after 1890 come from Foreman-Peck and Lains (2000). Before 1890 GDP per capita is assumed to grow at the same year-on-year rate as it did between 1890 and 1913.

Estimates for Turkey after 1913 come from Maddison (1995). Before this date it is assumed that GDP per capita grew at the same year-on-year rate as did estimates of Turkish real wages from Williamson (2000).

GDP for Uruguay is taken from Mitchell (1993) for the period 1935-1940. Annual GDP per capita estimates 1914-1934 are calculated by assuming that Uruguay deviated from her GDP per capita trend -- between the benchmark years of 1914, found in Clemens and Williamson (2000), and 1935, found in Mitchell (1993) -- in the same way that Argentina did. Before 1914 it is assumed that Uruguay grew at the same year-on-year rate as did our estimates of Argentine GDP per capita.

Data for a small remaining number of missing years are geometrically interpolated.

Schooling (Primary School Enrollment Rates)

As reported in Clemens and Williamson (2000, 2001), this regressor is the fraction of the population aged 14 years or less that is enrolled in primary school in the first year of the

period in question, and is in units of enrolled students per 10,000 persons aged 14 years or below. It is calculated as the quotient of primary enrollment as a fraction of the total population and children aged 14 or below as a fraction of the total population. Each is discussed in what follows.

Per Capita Primary School Enrollment Rates: For the years 1870-1914, data for Australia, Austria-Hungary, Canada, Chile, Colombia, Denmark, Greece, Norway, Peru, Portugal, Sweden, the United Kingdom and Uruguay are from Banks (1976). For the same period, data for Argentina, Australia (pre-1901), Brazil, Burma, Ceylon, China, Egypt, France, Germany, India, Indonesia, Italy, Japan, Mexico, the Philippines, Russia, Serbia, Spain, Thailand, Turkey, and the United States are from Richard A. Easterlin, "Why Isn't the Whole World Developed?" *Journal of Economic History* 41, 1 (March 1981):1-19, and Richard A. Easterlin, *Growth Triumphant* (Ann Arbor, Mich.: University of Michigan Press, 1996), p. 61. Missing years for Ceylon are filled from the 1914 edition of the *Ceylon Blue Book*, endsheet. Missing years for Colombia (in 1869, 1870, and 1883) are found in Ocampo (1997), pp. 160-1 and Gabriel Poveda Ramos, *Dos Siglos de Historia Económica de Antioquia* (Medellin: Biblioteca Pro Antioquia, 1979), p. 95. Pre-1901 data for Cuba are in Susan Schroeder, *Cuba: A Handbook of Historical Statistics* (Boston: G. K. Hall & Co., 1983). Pre-1906 data for New Zealand are in Bloomfield (1984), p.110.

For the years 1918-1938, per capita primary school enrollment rates for most countries are taken from Banks (1976). Wartime years (1914-1918) are geometrically interpolated. Banks does not include primary school enrollment data for 1914-1938 for Burma, Ceylon, Egypt, India, Indonesia, the Philippines, and Thailand, and so figures were taken from Mitchell (1998). These data are then divided by the size of the population of each country (see population data appendix for details), in order to arrive at per capita school enrollment. Figures for Ceylon denote primary and secondary school enrollment per capita combined (but it is assumed that secondary enrollment is a tiny fraction of total school enrollment in Ceylon).

Primary school enrollment figures for Australia are from Peter H. Lindert, "Democracy, Decentralization, and Mass Schooling Before 1914: Appendices," *Working Paper 105*,

Agricultural History Center, University of California at Davis (2001), pp. 11-12. Missing years are geometrically interpolated.

Fraction of the Population Under the Age of 14: Unless otherwise noted, the fraction of the population under the age of 14 is calculated from the appropriate editions of Mitchell (1992, 1993, 1998), where the population distributions by age are provided for census years. The youth dependency ratios (i.e. fraction of the population under the age of 14) for missing years are obtained by geometric interpolation.

Figures for Chile before 1914 are from Mamalakis (1989, volume 2). Figures for Ceylon before 1914 are approximated using a straightforward demographic model employing population growth figures from the 1914 Ceylon Blue Book, and viable birth and infant mortality statistics from L. J. B. Turner, *Report on the Census of Ceylon 1921* (Colombo: H. Ross Cottle, Government Printer, 1923), pp. 11, 15.

Youth dependency ratio statistics for China are gathered from a range of sources, giving a picture of trends in the ratio from 1771 to 1990. Data for 1771-1835 and 1872 are from Ping-ti Ho, *Studies on the Population of China 1368-1953* (Cambridge, Mass.:Harvard University Press, 1959), pp. 59, 68. A benchmark from 1842 is in Gilbert Rozman, *Population and Marketing Settlements in Ch'ing China* (Cambridge: Cambridge University Press, 1982), p. 59. A figure from 1953 is in S. Chandrasekhar, *China's Population: Census and Vital Statistics* (Honk Kong: Hong Kong University Press, 1960), p. 47, and figures from 1953, 1964, and 1982 are in Li Chengrui, *A Study of China's Population* (Beijing: Foreign Languages Press, 1992). A datapoint for 1958 is in Chai Sunglin, *Population and Population Policy in Mainland China* (Taipei: Asia and the World Forum, Monograph 6, 1977), p. 56. Benchmarks for 1926, 1929, 1931, 1934, and 1947 are in Yang Zi Hui, *China Historical Population Data and the Relevant Studies* (Beijing: China Reform Publishing House, 1995), pp. 1364, 1366, 1369. The general agreement of these disparate figures on long-term trends in the population structure allows confident interpolation for 1870-1914.

Data for Colombia before 1914 come from Mitchell (1998), Ocampo (1997), p. 160, and Poveda (1979), p. 95. Data for Cuba before 1914 are from Schroeder, op. cit., pp. 51-3.

A benchmark for Egypt in 1917 is from Mitchell (1998), and in preceding years the Egyptian youth dependency ratio is assumed to change at the same rate as that of India.

Data for Indonesia are from Boomgaard and Gooszen (1991), pp. 200-3. Figures for New Zealand are in Bloomfield (1984), pp. 48-50. Peruvian figures for 1876 are benchmarked in Alida Díaz, *El Censo General de 1876 en el Peru* (Lima: Seminario de Historia Rural Andina, 1974), Table 8, p. 33. These are compared with post-1940 statistics in Mitchell (1998) to reveal long-term trends in the Peruvian population structure. For the Philippines, there is a 1918 benchmark in Felipe Buencamino, Sr., *Census of the Philippine Islands, Vol. 2* (Manila: Census Office of the Philippine Islands, 1921), p. 65, and a 1903 benchmark in J. P. Sanger, *Census of the Philippine Islands, Vol. 2* (Washington, D.C.: United States Bureau of the Census 1905), p. 65. Serbian data before 1914 come from Sundhaussen (1989), p. 114. Data for Thailand in 1911, 1925, 1947, and 1960 come from the Statistical Year Book of the Kingdom of Siam published by the Ministry of Finance, and data points for 1929 and 1937 are in Mitchell (1998). Together these give a clear view of long-term trends in the Thai population structure that allow confident extrapolation to the period 1870-1913. For Turkey, an 1886 benchmark can be found in McCarthy (1982), p. 87, and comparison points for 1935-1960 are in Mitchell 1998 op. cit., giving a clear picture of long-term trends in Turkish demographic structure. Uruguayan dependency ratios for 1900 and 1908 are in Mitchell (1998), and before 1900 they are assumed to have changed at the same rate as did those for Argentina.

Population

Population is listed in the database in thousands of persons. Annual estimates of the population of Argentina, Australia, Austria, Brazil, Canada, Chile, China, Colombia, Cuba, Denmark, France, Germany, Greece, Italy, Mexico, New Zealand, Norway, Peru, Portugal, Russia, Spain, Sweden, Thailand, United Kingdom, Uruguay, USA, and Yugoslavia are given in Banks (1976). Population for Australia before 1901, Cuba before 1902, Germany before 1867, and New Zealand before 1907 are not reported in Banks (1976). Population figures for these periods are taken from the appropriate volume of Mitchell and linked to the series in Banks.

Population data for eight countries – Ceylon, Burma, Egypt, India, Indonesia, Japan, the Philippines, and Thailand – are not available in Banks (1976) for the period in question. For the years 1914-1950, population data for Ceylon are taken from Mitchell (1998). Pre-

1914 figures for Ceylon come from Colonial Secretary's Office, *Ceylon Blue Book* (Colombo: H.C. Cottle Government Printer, 1914). Population figures for Egypt for the full period are taken from the appropriate volume of Mitchell (1998). For the years 1914-1950, population data for Burma, India, Indonesia, Japan, the Philippines, and Thailand are taken from Maddison (1995). Before 1914, the population figures are taken from the appropriate volume of Mitchell (1998) and linked to the Madison series.
Additional missing years (in particular, war years) are derived by geometric interpolation.

Partner Tariffs

The index of tariffs in principal trading partners is calculated as the weighted average of own tariffs in the four or five countries to which the country in question exported the largest absolute value of goods (for Colombia only the top three trading partners are covered). The weights are the absolute value of exports that went to each of said partners. These partner export figures are taken from Mitchell (1993). In all cases, the vast majority of each country's exports are accounted for by exports to these principal trading partners.
Note that gaps exist in the Partner Tariff data, particularly in the period 1870-1900, due to the absence of partner weights data in Mitchell. Given that partner weights do not seem to change significantly over time, we were able to interpolate partner weights (and thus partner tariff) data by assuming that trading partner weights are the same in missing years as they were in the closest years for which Mitchell has data. Using the average of partner weights for the earliest 5 years available, partner tariff data was constructed for Mexico, Brazil and Peru before 1900. Similarly, through geometric interpolation of partner weights, smaller gaps in the Mitchell data were filled for other countries.

Effective Distance

Effective Distance from trading partners is calculated as the product of two quantities. The first quantity is the average distance from the capital city of the country in question to the capital cities of its principal trading partners, weighted by the value of exports going to each of those partners in the year in question. Distances are taken from the Microsoft Excel Worksheet prepared by Howard Shatz's unpublished data (Cambridge: Harvard University Center for International Development, 1997), which gives them in miles between 254 (mainly capital) cities of the world using the great circle formula. The

second quantity is an index of tramp shipping freight charges (per distance and weight) shown in Table VIII (p. 122) of L. Isserlis, "Tramp Shipping Cargoes, and Freights," *Journal of the Royal Statistical Society* 101(1) (1938): pp. 53-146. Distance from the closest world export center is multiplied by this shipping freight index. Note that the Isserlis index only offers an estimate of changes in global transportation costs which is generic to the world as a whole. By using it, we only control for differences in transportation costs over time, not across space.

Exceptions to the above are the eight Latin American countries (Coatsworth and Williamson 2002), work that uses new estimates that break down freight rates by routes (Saif Shah Mohammed and Jeffrey G. Williamson, "Freight Rates and Productivity Gains in British Tramp Shipping 1869-1939," unpublished paper, Department of Economics, Harvard University, November 2002), based on E. A. V. Angier and *Fairplay*, sources that underlay Isserlis (1938).

Railway Mileage

Railroad mileage, defined as miles of line (public and private) rather than miles of track, is taken from Banks (1976). However, figures in Banks' database do not reach back all the way to 1865 for every country. Gaps were filled by appealing to a variety of sources. Railway lengths for Cuba are taken from Zanetti Lecuona and García Alvarez, *Caminos Para el Azucar,* (Havana 1987), Appendix Table 1. Railroad length for Austria, Denmark, France, Germany, Greece, Ireland, Italy, Norway, Portugal, Russia/USSR, Serbia, Sweden, and the United Kingdom are taken from Mitchell, *International Historical Statistics Europe 1750-1993, 4th edition* (London 1998), p. 675 ff, Table F1. Data for China, Egypt, India, Indonesia, Japan, Burma (post 1933), Australia and New Zealand comes from Mitchell, *International Historical Statistics Africa, Asia and Oceania 1750-1993, 4th edition* (London 1998), p. 673 ff, Table F1. Earlier railroad mileage for Burma is taken from Saito and Kiong (1999), p. 167 ff, *Report on the Administration of British Burma* (Rangoon: Government Printing, 1878-1886), and *Report on the Administration of Burma* (Rangoon: Government Printing, 1907-1929).

Inflation

Inflation is calculated as the annual percentage change in the Consumer Price Index (CPI) of each country. The annual change in the CPI for most periods and countries is given in

Taylor (2000). However, Taylor's database does not reach back all the way to 1865 for every country and he omits some countries in our sample. Gaps were filled by appealing to the inflation data and cost of living indices from a variety of sources, and, where indicated, Taylor was replaced by what we judged to be a higher quality source. **Argentina 1864-1890**: uses a cost of living index from Roberto Cortes Conde's unpublished worksheets (based on wholesale prices of 16 commodities with fixed weights); **Argentina 1890-1899**: uses a cost of living index from Cortes Conde, *El Progresso Argentino 1880-1914* (Buenos Aires: Editorial Sudamericana, 1979), p. 226; **Argentina 1900 onwards** uses data from Andre A. Hoffman, *The Economic Development of Latin America in the Twentieth Century* (Cheltenham, UK: Elgar, 2000), Table G.1, p. 262**. Austria-Hungary 1867-1900:** from Brian R. Mitchell, *European Historical Statistics 1750-1970*, abridged ed. (London: Macmillan 1978), pp. 389-90. **Brazil 1865-1870**: from K. W. Goldsmith, *Brasil 1850-1984* (Sao Paulo: Harper and Row, 1986): pp. 30-1; **Brazil 1870-1899:** from Luis Catao, "A New Wholesale Price Index for Brazil During the Period 1870-1913," *Revista Brasileira de Economica* 46, 4 (October/December 1992), Appendix 1, Table 1, p. 530; **Brazil 1900 onwards:** from Hoffman (2000), Table G.1, p. 262. **Burma 1873-1920:** from cost of living index in Jeffrey G. Williamson, "Real Wages and Relative Factor Prices in the Third World 1820-1940: Asia," *HIER Discussion Paper 1844*, Department of Economics, Harvard University (August 1998), Appendix Table 1.2, p. 4; **Burma 1921 onwards:** later years use the Burmese cost of living index in the United Nations *Statistical Yearbook 1949-50* (New York, 1950) p. 402 and the Indian CPI given in Taylor (2000). **Ceylon:** estimated using the export and import price indices, the terms of trade index, and the working class cost of living index for Ceylon given in *Thirty Years Trade Statistics of Ceylon (1925-1954)* , Part IV (Colombo: Government Press, 1957), p. 1901. **Chile**: from Rolf J. Luders, "The Comparative Economic Performance of Chile: 1810-1995," *Estudios de Economica* 25(2) (December 1998), pp. 243-7. **China 1902-1926:** from Williamson (August 1998), Appendix Table 2.2, p. 10. **Colombia 1865-1900**: from a cost of living index in Alberto Pardo Pardo, *Geografia, Economica y Humana de Colombia* (Bogata: Ediciones Tercer Mundo 1972), p. 221**; Colombia 1901 onwards:** from Hoffman (2000), Table G.1, p. 262. **Cuba 1905-1913:** we employ a Havana food price index from Oscar Zanetti and

Alejandro Garcia, *United Fruit Company: Un Caso del Dominio Imperialista en Cuba* (Havana: Editorial de Ciencias Sociales, 1976), Caudro VI, p. 441; **Cuba 1913-1920:** uses Leandro Prados de la Escosura, *Output and Expenditure in Spain 1850-1990: New GDP Series* (mimeo., 1997); **Cuba 1921 onwards:** estimated using the cost of food index given in the *Anuario Estadistico de Cuba de 1952* (Havana: Ministerio de Hacienda, Republica de Cuba), p. 285 and the Cuban cost of living index from the United Nations *Statistical Yearbook 1949-50*, p. 401. **Egypt 1865-1915**: cost of living index from Jeffrey G. Williamson, "Real Wages and Relative Factor Prices in the Third World: The Mediterranean Basin," *HIER Discussion Paper 1842*, Department of Economics, Harvard University (July 1998), Appendix Table A1.2, p. 4. **India**: taken from Michelle McAlpin, "Price Movements and Fluctuations in Economic Activity (1860-1947)," in D. Kumar and M. Desai (eds.), *The Cambridge Economic History of India, Volume 2: c1757-c1970* (Cambridge: Cambridge University Press, 1982), Appendix Table 11A.1, pp. 903-4. **Indonesia 1865-1925:** cost of living index from Williamson (August 1998), Appendix Table 4.3, p. 36. **Indonesia 1926 onwards:** calculated from the consumer price index given in Mitchell (1993). **Japan 1865-1900:** cost of living index from Williamson (August 1998), Appendix Table 5.2, p. 42. **Mexico 1877-1899**: we use cost of living information from Instituto Nacional de Estadistica, *Geografia e Informatica, Estadisticas Historicas de Mexico, tomo II* (Mexico City 1986), Cuadro 20.2, p. 733; **1900 onwards:** uses Hoffman (2000), Table G.1, p. 262. **Peru 1896-1914**: from Bruno Seminario and Arlette Beltran, "Crecimiento Econmico en el Peru: 1896-1995, Nuevas Evidencias Estadisticas" (Lima: Universidad Del Pacifico CIUP, 1998), Delflactor implicito del PBI, pp. 255-6. **The Philippines 1899-1920:** cost of living index in Williamson (August 1998), Appendix Table 7.2, p. 56; **The Philippines 1921 onwards:** estimated using the cost of living index given in the United Nations *Statistical Yearbook 1949-50* (New York, 1950), p. 403 and the *Yearbook of Philippine Statistics* (Manila: Bureau of the Census and Statistics, Republic of the Philippines, 1947), p. 251. **Portugal:** estimated using the annual change of the GDP deflator given in das Neves (1994), pp. 193-7. **Serbia 1865-1929:** cost of living from Williamson (July 1998), Appendix Table A3.2, p. 14. **Spain**: implicit GDP price deflator in Leandro Prados de la Escosura, "Spain's Gross Domestic Product, 1850-1990: A New Series," *Ministerio de Economia y Hacienda Documentos de*

Trabajo D-93002, Madrid (March 1993). **Thailand 1865-1917:** cost of living index from Williamson (August 1998), Appendix Table 9.2, p. 67; **Thailand 1918 onwards:** calculated as the annual percentage change in the wholesale food price index, taken from Wilson (1983), p. 322. **Turkey**: Istanbul CPI from evket Pamuk, *500 Years of Prices and Wages in Istanbul and Other Cities* (Ankara: State Institute of Statistics, 2000), Table 4.1, pp. 73-4, col. 6. **Uruguay:** from Luis Bertola, Leonardo Calicchio, Maria Camou and Laura Rivero, "El PBI Uruguayo 1870-1936 y otras estimaciones," *Programa de Historia Economica y Social DT 43*, Universidad de la Republica, Montevideo (August 1998), pp. 58-9.

Federal System

This is a dummy variable; if a "federalist" regime = 1, 0 otherwise (ie, centralized decision-making authority). For all countries outside of Latin America, we employed the "central" variable from the Polity III database (Polity III Project, Integrated Network for Societal Conflict Research (INSCR) Program, Center for International Development and Conflict Management (CIDCM), University of Maryland, www.bsos.umd.edu/cidcm/inscr/polity). Polity III identifies federal systems, or the geographic concentration of decision-making authority, on a three-scale, where 1 = Unitary, 2 = Intermediate category, and 3 = Federal. In order to convert this three-scale to a dummy variable, a value of 3 was assigned a 1, a 0 otherwise

For Latin America, a federal dummy variable was developed based on original research reported in Coatsworth and Williamson (2002). They defined a regime as centralist if the constitution granted authority over all or nearly all taxes and spending to the national government. In many cases provincial and municipal officials were appointed by the president and had little or no authority to tax and only limited authority over spending. We defined a regime as federalist if the constitution provided for state and municipal governments with power to spend and/or tax. In some federalist countries, taxes were collected by the central government and then redistributed to local and state authorities. This dummy variable takes on a value of one during the federalist years as follows (zero otherwise, centralist years): Argentina, 1821-1943; Brazil, 1889-1930, 1945-50; Chile, 1821-30; Colombia, 1849-86; Cuba, none; Mexico, 1823-36, 1847-53, 1856-63, 1867-

1950; Peru, 1827-35; Uruguay, none. We are aware that our characterization of which Latin American countries were federal and when differs sharply with Polity III.

Colony

This is a dummy variable; if a "colony" = 1, 0 otherwise. The colonies 1870-1938 are: Burma, Ceylon,

India, Indonesia, the Philippines. Others changed their colonial status during our period: The following were colonies, or acted like colonies, during some part of our period: Cuba (1870-1901), Egypt (1882-1938) and Serbia (1870-1920).

Urbanization

This regressor is the fraction of the population living in urban agglomerations of 100,000 or more in the first year of the period in question. Data for most countries come from Banks (1976) or Mitchell. Gaps (typically less than five years, usually during wartime) were geometrically interpolated. Post-World War I urbanization estimates for Austria-Hungary are for Austria alone and for Serbia are for Yugoslavia alone.

Data for Argentina, Austria-Hungary, Brazil, Canada, Chile, Colombia, Denmark, France, Germany, Greece, Italy, Japan, Mexico, Norway, Peru, Portugal, Russia, Serbia, Spain, Sweden, Turkey, the United States, and Uruguay come from Banks. Data for Australia, Ceylon, Cuba, Egypt, India, the Philippines, and Thailand are taken from various volumes of Mitchell. An additional benchmark for India is in Edwin S. Mills and Charles M. Becker, *Studies in Indian Urban Development* (New York: Oxford University Press, 1986), p. 34. An additional benchmark for the Philippines is in Rajeswary Ampalavanar Brown, *Capital and Entrepreneurship in South-East Asia* (New York: St. Martin's Press, 1994), p. 228.

Figures in Banks' database, however, do not reach back all the way to 1865 for every country. Thus, data for Burma were obtained from Saito and Kiong (1999), while those for China were constructed by Clemens and Williamson (2001) from Kang Chao, *Man and Land in Chinese History: An Economic Analysis*, (Stanford, Cal.: Stanford University Press, 1986), which measures only those living in cities greater than 2,000. Data for Thailand comes from the population of Bangkok in Mitchell (1993), while those for New Zealand are from G. T. Bloomfield, *New Zealand: A Handbook of Historical Statistics*,

(Boston: G. K. Hall, 1984), p. 56. Figures for Indonesia are from P. Boomgaard and A. J. Gooszen, *Changing Economy in Indonesia: Volume 11, Population Trends 1795-1942* (Amsterdam: Royal Tropical Institute, 1991), pp. 213, 220..

We also explored the online Populstat database (Population Statistics: Growth of the population per country in a historical perspective, including their administrative divisions and principal townships, by Jan Lahmeyer, http://www.library.uu.nl/wesp/populstat/populhome.html). Populstat collects historical demographical data for major urban centers from demographic databases, encyclopedias and yearbooks (see http://www.library.uu.nl/wesp/populstat/sources.html for a full list of sources). Urbanization figures were calculated for a particular country by summing the populations of cities with populations in excess of 100,000, and dividing this figure by the country's total population in that year (population sources and methodology are described above). Where the Populstat estimates overlapped with that of the Banks and Mitchell, the data were typically in almost complete agreement

Terms of Trade Index (Net Barter)

Well known, published series were employed for the terms of trade for the US, the UK, France, Germany, Sweden, Italy and Austria. Terms of trade for Austria and Italy after 1914, however, are not available, and are omitted from our dataset. Data for **Austria-Hungary** from 1882-1913 are found in Scott M. Eddie, "The Terms and Patterns of Hungarian Foreign Trade, 1882-1913," *Journal of Economic History*, 37(2) (June 1977), pp. 329-58. An index for 1876-1882 is constructed from indices of the physical quanta and values of exports and imports given in *Statistik des Auswärtigen Handels des Österreichisch-Ungarischen Zollgebiets im Jahre 1891* (Vienna: Statistischen Departement im K. K. Handelsministerium, 1893), pp. LXVIII-LXIX. For the period 1865-1875 the same source reports only export and import values, not physical quanta. Since the quanta display extremely stable trends during 1876-1892 (unlike the values, which are subject to the vagaries of prices), the quanta for 1865-1875 are extrapolated assuming the same, stable growth rate observed on 1876-1892. Combining these estimates with the trade value figures given for 1865-1875 yield a terms of trade estimate for this period. Terms of trade for **France** 1870-1896 come from Charles Kindleberger, *The Terms of Trade: A European Case Study (Cambridge, Mass.:* MIT Press, 1956),

Table 2-1, pp. 12-13. This is linked to a series from 1896-1939 found in P. Villa, *Une Analyse Macroéconomique de la France au XXeme Siècle* (Paris : CNRS Editions, Monographies d'Économetrie, 1993), pp. 445-6. **German** terms of trade for 1870-1913 and 1921-1938 come from Walther G. Hoffmann, *Wachstum der Deutschen Wirtschaft seit der Mitte des 19 Jahrhunderts* (Berlin*:* Springer-Verlag, 1965), Table 134, col. 1, p. 548. **Italy's** terms of trade with Great Britain are taken as a proxy for overall Italian terms of trade. The former are found in I. A. Glazier, V. N. Bandera, and R. B. Berner, "Terms of Trade between Italy and the United Kingdom 1815-1913," *Journal of European Economic History*, 4(1) (Spring 1975), pp. 5-48. **Sweden's** terms of trade are taken from Simon Kuznets, "Quantitative Aspects of the Economic Growth of Nations: X. Level and Structure of Foreign Trade: Long-Term Trends" [originally published 1967], reprinted in Harley (1996), Table 12, p. 150. The **United Kingdom** terms of trade 1870-1933 come from W. Schlote, *British Overseas Trade*, (Oxford: Basil Blackwell, 1952), Table 26, cols. 9 and 10, pp. 175-8, and for 1933-1938 from B. R. Mitchell and P. Deane, *Abstract of British Historical Statistics* (Cambridge: Cmabridge University Press, 1962), pp. 331-2. **United States** terms of trade for 1936-1939 are from B.R. Moulton, *Improved Estimates of the National Income and Product Accounts for 1929-1999: Results of the Comprehensive Revision* (Survey of Current Business, April 2000), while 1870-1935 are from Jeffrey G. Williamson, *American Growth and the Balance of Payments 1820-1913* (Chapel Hill, North Carolina: University of North Carolina Press, 1964), Table B4, p. 262. For the remaining countries, a net barter terms of trade (NBTT) series was calculated from original sources. Note that the NBTT is simply the ratio of export prices to import prices, each weighted appropriately:

$$NBTT_{jt} = \frac{\sum p_{ijt}^{X} \cdot w_{ij}^{X}}{\sum p_{it}^{M} \cdot w_{i}^{M}}$$

for product *i*, country *j*, and period *t*. In this formulation, the export price index in the numerator is country-specific while the import price index in the denominator, is not. This is a simplification employed due to (i) the limited quality and quantity of data on imports and import prices for countries in the periphery, and (ii) the similarity observed, in what records are available, between the composition of developing country imports. While detailed data on exports weights and prices are available for virtually all of the

countries and all of the years in our sample, import data are much more limited. These limitations and their consequences are discussed below.

Export Weights: For the purposes of this study, export weights have been calculated by individual country using the *current value* of major commodity exports and *fixed weights*. The use of a fixed set of weights is essential for disentangling price from quantity movements. Of course, any such approach is fundamentally flawed, not least because over a long period of time the mix of major commodity exports can shift significantly. A compromise position was taken by changing the export weights at approximately 20-year sub-periods. These sub-periods are 1870-1890, 1890-1913, 1913-1929, and 1930-1950, and within these sub-periods the weights are calculated using sample year data. Export values for major commodities for **Argentina**, **Brazil**, **Canada**, **Chile**, **Colombia**, **Cuba**, **Mexico**, **Peru**, and **Uruguay** are taken from Mitchell, *International Historical Statistics The Americas 1750-1993*, p. 506ff, Table E3. The same data for **Australia**, **Burma**, **Ceylon**, **Egypt**, **India**, **Indonesia**, **Japan**, **Philippines**, **Thailand**, **Turkey** and **New Zealand** come from Mitchell, *International Historical Statistics Africa, Asia and Oceania 1750-1993,* p. 637ff, Table E3. Main commodity exports for **Denmark**, **Greece**, **Norway**, **Portugal**, and **Spain** were calculated from *Statistical Abstract for Principal and Other Foreign Countries* (London: 1876-1912) and *Die Wirtschaft des Auslandes, Statistisches Reichsamt* (Berlin: 1928). **Russia**'s export weights for the first two subperiods come from *Statistical Abstract for Principal and Other Foreign Countries* (London: 1876-1912), and the second two subperiods from Michael Dohan, *Two studies in Soviet terms of trade, 1918-1970* (Bloomington: International Development and Research Center, Indiana University, 1973). Export weights for **Serbia** come from Holm Sundhaussen, *Historische Statistik Serbiens, 1834-1914: mit Europaischen Vergleichsdaten* (Munchen: R. Oldenbourg, 1989) for the first two subperiods, and for the latter two from *Die Wirtschaft des Auslandes, Statistisches Reichsamt* (Berlin: 1928). Export weights for **China** were obtained from Hsiao Liang-Lin, *China's Foreign Trade Statistics 1864-1949* (Cambridge, Mass.: Harvard University Press 1974). Only major export products were included (those whose value exceeded 5% of total trade value). These include beans and bean products, cotton yarn and piece goods, raw cotton, silk

piece goods, raw silk, and tea. Eggs and egg products were omitted due to lack of price data.

Export Prices: Export prices are quoted in foreign markets (wherever possible, in the UK). Wholesale prices for **Wheat**, **Maize**, **Rice**, **Beef**, **Butter**, **Sugar**, **Coffee**, **Tea**, **Iron**, **Copper**, **Tin**, **Lead**, **Coal**, **Cotton**, **Flax**, **Hemp**, **Jute**, **Wool**, **Silk**, **Hides**, **Nitrate**, **Palm Oil**, **Olive Oil**, **Linseed**, **Petroleum**, **Indigo** and **Timber** are taken from Sauerbeck, "Prices of Commodities and Precious Metals," *Journal of the Statistical Society of London* 49(3) (September 1886), Appendix C, for the years 1860-85; Sauerbeck, "Prices of Commodities During the Last Seven Years," *Journal of the Royal Statistical Society* 56(2) (June 1893), p. 241ff, for the years 1885-1892; Sauerbeck, "Prices of Commodities in 1908," *Journal of the Royal Statistical Society* 72(1) (March 1909) for the years 1893-1908; Sauerbeck, "Wholesale Prices of Commodities in 1929," *Journal of the Royal Statistical Society* 93(2) (1930), p. 282ff for the years 1908-1929; Sauerbeck, "Wholesale Prices of Commodities in 1916," *Journal of the Royal Statistical Society* 80(2), p. 289ff for the years 1908-1916; and Sauerbeck, "Wholesale Prices in 1950," *Journal of the Royal Statistical Society* 114(3) (1951), p. 417ff for the years 1916-50. Prices for **Cocoa**, **Crude Oil**, **Rubber**, **Tobacco** and **Zinc** are taken from *Historical Statistics of the United States: Colonial Times to 1970*, Bicentennial ed., Part 1 (Washington: US Department of Commerce, Bureau of the Census, 1975). **Cotton Yarn**, **Cotton Piece Goods** and **Silk Piece Goods** were approximated using the Textiles price index from the same source. Prices for **Fruits** and **Nuts** 1880-1914 are taken from Jose M. Critz, Alan L. Olmsted and Paul W. Rhode, "International Competition and the Development of the Dried Fruit Industry 1880-1930," in S. Pamuk and J. G. Williamson (eds.), *The Mediterranean Response to Globalization before 1950* (London: Routledge, 2000), Table 8.2. Prices for **Opium** 1860-1906 are taken from Ahmad Seyf, "Commercialization of Agriculture: Production and Trade of Opium in Persia, 1850-1906," *International Journal of Middle East Studies* (1984), Table 4. Prices for **Beans** and **Bean Products** were calculated from Liang-Lin (1974), p. 80ff.

Import Weights: A single set of import weights is employed for all countries in the sample. Import data, unlike that of exports, is almost uniformly poor, in particular in countries outside the European core. Traditionally, studies of country terms of trade have

compensated for this lack of data through the use of British export data as a proxy for the imports of less developed nations. This approach is undesirable given that the composition of British exports can hardly be considered representative of the imports of developing countries as a whole, and because the use of current-year weights means that movements reflect changes in composition, not just prices. As an alternative, however, we employ a fixed index of non-primary goods from US statistics. This import index, like the British one, is country invariant. In the end, the differences are not material; the two series are almost identical (probably due to the heavy content of metals and textiles in both indices). This US manufactured export statistic is a weighted sum of the prices of **textiles** (55%), **metals** (15%), **machinery** (15%), **building materials** (7.5%), and **chemicals and pharmaceuticals** (7.5%). A fixed weighting for all developing nations may, of course, be unrepresentative of any country's specific import mix. Yet, such a metric may be quite relevant for measuring the changing value of the country's exports relative to a fixed package of manufactured products available for import. In this sense our terms of trade represents the purchasing power of local commodities in terms of rich-country goods. In any case, a review of each nation's external commerce documents reveals remarkably similar import compositions. For the years 1870-1900, import composition for **Australia**, **Canada**, **Ceylon**, **India** and **New Zealand** was examined from *Statistical abstract for the several colonies and other possessions of the United Kingdom no.1-40, 1863-1902*. Import composition data for **Burma** come from Saito and Kiong (1999), p. 177, table VII-4. Import composition data for **China**, **Denmark**, **Egypt**, **Greece**, **Japan**, **Norway**, **Portugal**, and **Russia** were calculated from *Statistical Abstract for Principal and Other Foreign Countries* (London: 1876-1912), no. 13. Data for the **Philippines** are taken from *Quarterly Summary of Commerce of the Phillipine Islands* (Washington, D.C.: 1908), p. 27 for the year 1893. Import composition for **Serbia** before 1914 is recorded in Holm Sundhaussen, *Historische Statistik Serbiens 1834-1914* (Munich 1989), pp. 352-5. Main imports for **Turkey** are calculated from Michael G. Mulhall, *Dictionary of Statistics* (London 1892), p. 145 for the year 1888. For the years 1900-1940, import weights for **Australia**, **Canada**, **Ceylon**, **India**, **New Zealand** are calculated for several reference years from *Statistical abstract for the several British self-governing dominions, colonies, possessions, and protectorates no.41-53,*

1903-1915, Statistical abstract for the several British oversea dominions and protectorates no.54-59, 1917-1927, Statistical abstract for the British Empire no.60-68, 1929-1938, Statistical abstract for the British Commonwealth no.69-70, 1945-1947 and *Statistical abstract for the Commonwealth (trade statistics) no.71-72, 1948-1951*. Composition of main imports for reference years after 1900 for **Argentina**, **Chile**, **Greece**, **Indonesia**, **Japan**, **Mexico**, **Norway**, **Portugal**, **Russia**, **Serbia**, **Spain**, **Thailand**, **Uruguay** comes from *Die Wirtschaft des Auslandes 1900-1927* (Berlin 1928). Data for **Burma** comes from Saito and Kiong (1999), p 177, Table VII-4. Data for the **Philippines** is taken from *Foreign Commerce of the Phillipine Islands,Washington 1912-1913* for the reference years 1907, 1908 and 1910. Composition of main imports for **Turkey** was calculated from *Annuaire Statistique, Republique Turque*, vol.1, pp. 103, 106, and vol. 3, pp. 313 and 314 for the years 1923, 1926 and 1929.

Import Prices: US price series for textiles, metals, machinery, building materials, and chemicals and pharmaceuticals come from *Historical Statistics of the United States*, Part 1 (1975), pp. 200-1.

A Note on Import and Export Price Data: UK and US prices are employed in the theory that the prices in these large, integrated and (in the UK, at least) unprotected markets would supply us with a relatively reliable "world" price index for each commodity group. A chief disadvantage of using such world price indices, however, is that home market prices in each country may diverge from the world market prices in the short and even long term. This may be because of transport costs, differences in product features and quality, variations in the composition of the products within a category, and less-than-perfect market integration. Kindleberger (1958) illustrates the wide divergence in the prices of bulky products such as coal and lumber between two markets as closely integrated as the US and UK. The key disadvantage of not using the home market price is, we suspect, the distortion created by changes in transport costs. In a moment we will discuss the adjustments made to our terms of trade figures to account at least partially for transport cost changes. Overall, though, we feel the advantages of employing world price indices outweigh these disadvantages. First and foremost, home market prices are not typically on hand for the periods and countries in question. Rather, only the somewhat

less desirable unit prices (calculated as the value of imports divided by the volume) are available. Second and more important, we believe UK and US market prices to be more reliable, accurate and comparable given the quality of reporting (at the time) and the quality of scholarship on these prices since then. Third, to the extent that commodity markets are well integrated worldwide, the UK and US market prices should approximate the world price. This is especially true because we are interested in price changes, not levels. To the extent that UK and US prices move in similar directions and similar magnitudes to prices in the rest of the world, these "world" price indices will more or less represent price changes relative to an index year in other nations. We believe this to be a reasonable and necessary assumption. Fourth, these foreign market price indices would have been available to (and probably used by) industrialists and policymakers throughout the period in question. Accordingly, for questions of policy response (and perhaps price setting) foreign market indices may be a more appropriate data source than those in home markets. Fifth, the use of a world price index harmonizes and simplifies construction of the indices, enabling us to examine a wider sample of countries at the cost, perhaps, of precision. Fifth, by measuring both the export and import price indices in a common currency, we eliminate any inflationary bias from the figures.

The Gold Standard

The regressor is calculated as the fraction of years in the period during which the country was on a pure gold standard; an alternative regressor allowed also a silver or bimetallic standard. A detailed, year-by-year assessment of monetary regimes for most of our countries can be found in Lawrence H. Officer's "Gold Standard" web site at www.eh.net/encyclopedia/officer.gold.standard.php. These data document monetary regimes -- gold, silver, bimetallic, or paper standard.

Monetary regimes for Cuba and Serbia are taken to be as reported in Taylor (2000). The regime for pre-1914 New Zealand is given in J. Ernesto Lopez-Cordova and Chris Meissner, "Exchange-Rate Regimes and International Trade: Evidence from the Classical Gold Standard Era," Department of Economics, University of California at Berkeley, Berkeley, California (2000), Table 4.1. Finally, additional information for Colombia was extracted from Jos Antonio Ocampo, "Variable Monetary Regimes in a Preindustrial Economy: Colombia, 1850-1933," in P. M. Ace a and J. Reis (eds.), *Monetary Standards*

in the Periphery: Paper, Silver and Gold, 1854-1933 (New York: St. Martin's Press, 2000), pp. 207-51

Tariff Autonomy

"Tariff autonomy" is defined as the freedom to set tariffs independent of another state's military and political power. Burma, Ceylon, and India were subject to British imperial tariff collection policies, as Cuba was to the Spanish through 1899 and Indonesia (Netherlands Indies) was to the Dutch. The British Foreign Office in China largely eliminated the tariff restrictions imposed by the treaties of Nanking and Tientsin in 1929. Norway did not have an independent tariff policy under the Swedish crown through 1905. Gradual weakening of Ottoman control in Serbia is construed to imply tariff autonomy following the 1878 Treaty of Berlin. Egypt is taken to hold tariff autonomy under noninterventionist Ottoman rule during the years prior to the British invasion of 1882, but not thereafter. Thailand is taken to recover autonomy from the grasp of the unequal treaties in 1891. We take Turkey to have lost tariff autonomy in the brief years between its defeat in World War 1 and Mustafa Kemal's establishment of the Turkish Republic.

Thus, over the years spanning 1870 to 1938, the periods during which countries are deemed to have tariff-setting autonomy were: Argentina All; Australia All; Austria/Austria-Hungary All; Brazil All; Burma None; Canada All; Ceylon None; Chile All; China 1929 and after; Colombia All; Cuba 1899 and after; Denmark All; Egypt before 1882; France All; Germany All; Greece All; India None; Indonesia None; Italy All; Japan 1900 and after; Mexico All; New Zealand All; Norway 1906 and after; Peru All; Philippines None; Portugal All; Russia/USSR All; Serbia/Yugoslavia 1878 and after; Spain All; Sweden All; Thailand 1891 and after; Turkey All *except* 1919-1923; United Kingdom All; United States All; and Uruguay All.