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How much trade liberalization was there in the world before and after Cobden-Chevalier?

Antonio Tena-Junguito, Markus Lampe and Felipe Tâmega

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JEL Classification: F13, N70, O24

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INTRODUCTION

Recent *bilateral* or regional trade arrangements in Europe, the Americas, and elsewhere or GATT's *multilateral approach* after the Second World War are part of the debate surrounding different approaches to trade liberalization. In this regard, the historiography advances that the British 1846 unilateral repeal of the Corn Laws was not an overwhelming success in establishing free trade abroad. Indeed, according to classical accounts, the movement towards free trade only spread to the rest of Europe after the Anglo-French commercial treaty (known as Cobden-Chevalier Treaty) in 1860, mostly in the form of subsequent bilateral agreements between other parties.

Experts in nineteenth-century trade policy like Paul Bairoch, J.V.C. Nye, Douglas Irwin and Kevin O'Rourke and Jeffrey Williamson argue that the Cobden-Chevalier treaty was decisive in reducing tariff protection by spreading bilateral agreements containing the Most Favored Nation (MFN) clause.[1] For these authors, Cobden-Chevalier is regarded as the main episode in trade liberalization in this period, generating a harmonious period of free trade that compares favorably with the period before the 1860s or even with the more recent GATT era.

Is it really true that Cobden-Chevalier was the turning point for nineteenth-century trade liberalization outside Britain? Authors like Paul Sharp and Giovanni Federico emphasize that liberalization following the repeal of the Corn Laws was not, in fact, exclusive to Britain, and that the movement to lower tariff duties on agricultural products actually started well before 1846.[2] Robert Pahre offers an interesting account

[1] Bairoch, *Commerce exterieur* and "European Trade Policy"; Nye, "Myth" and *War*; Irwin, "Multilateral and Bilateral Trade Policy" and "Free Trade"; O'Rourke and Williamson, *Globalization*.

[2] Sharp, "1846," and Federico, "Corn Laws."

of the liberalizing treaties in Europe that followed the formation of the German Zollverein in 1834,[3] although these bilateral approaches were mostly focused on establishing 'freedom of commerce', that is, the possibility to trade internationally on more or less equal terms and reduced discrimination in shipping and related aspects of trading. Recently, Olivier Accominotti and Marc Flandreau have cast doubt on the path-breaking importance of the Anglo-French treaty.[4] They establish that trade liberalization, measured by the crude 'tariff revenue divided by total import value', actually made much more progress before 1860 than was generally believed, and suggest that it might have slowed down after 1860. In response to their results, Lampe highlighted that actually many commodities, especially agricultural goods, which otherwise figure very prominently in the historiography of market integration in the nineteenth century, were almost absent from the treaties. The bilateral treaties abolished prohibitions and reduced tariffs mostly on manufactured goods. In these sectors duties had been much higher than on raw materials and semi-manufactures well into the 1850s.[5] However, Lampe focuses almost exclusively on Europe, even if he observes that U. S. tariffs on manufactured goods clearly went up in the same period.

Most comparative studies focus on agricultural tariffs or price differentials or an unclear mix of prohibitive, protective and revenue-oriented tariffs as reflected by 'average tariff measures,' and to a large extent start in 1870. This article identifies the timing of nineteenth-century liberalization and the extent of initial protectionism by measuring the level of tariffs on a representative set of manufactured goods in 41

[3] Pahre, *Politics*.

[4] Accominotti and Flandreau, "Bilateral Trade Treaties"

[5] Lampe, "Bilateral Trade Flows" and "Effects."

countries and dependent territories around the world between 1846 and 1880. While ultimately we would like to establish tariff levels for agricultural, mining and manufactured goods since the end of the Napoleonic Wars, this research starts with manufacturing goods and in 1846.

Even if agricultural protection was a major obstacle to trade liberalization until the 1840s, protectionist arguments dealt with protecting manufactures to help domestic industrialization, and the literature on protectionism and development since Friedrich List does not believe that there is a protectionist "learning" period for agricultural producers.[6] Although industrialization only spread to some "Western" countries in the nineteenth century, domestic production of manufactured goods like textiles, metals, leather or paper took place all over the world. The tariff structure for these articles, especially for more skill-intensive products, had a major influence on the future competitiveness and comparative advantage of domestic manufacturing.[7]

Manufacturing was central to protection even though it accounted for less than half of total trade in the emerging world economy.[8] In the middle decades of the nineteenth century, agrarian primary products and minerals had very low tariffs and only some products of tropical agriculture, as well as those converted into alcoholic

[6] See Bairoch, *Economics*, pp. 17–18, 23, who discusses agricultural protectionism in the 'Golden Era of European Free Trade', including those of List's *The National System of Political Economy* (1841).

[7] Recent works on the relation between tariffs and growth in the late nineteenth century (Tena, "Bairoch Revisited"; Schularick and Solomou, "Tariffs"; Lehmann and O'Rourke, "Structure") which have shown that, if there is a relationship at all, what mattered for long-run growth were tariffs on manufactures, especially skill-intensive products.

[8] In the 1870s, manufactured goods accounted for 40% of the imports of the Northwestern European core of the world economy and its European periphery, for 60% of imports in non-European countries, but only 20% of imports in the protectionist United States (Yates, *Forty Years*, Table A.18 and Table A.22, pp. 226, 230). We should be aware that trade with bulk foodstuffs in the mid-nineteenth century was still largely an intra-European affair (ibid., p. 61)).

beverages, were taxed heavily in European countries. Therefore, although by omitting agriculture and mining we do not tell the whole story, we do contribute a decisive piece of evidence on the evolution of tariffs in the period under study. We would prefer tracing out the full process of the dismantling of mercantilist policies; all the way back to the Napoleonic wars. Unfortunately the very limited availability of comparable information regarding tariffs on manufactures before 1846 suggested that it was better to be cautious and not to include dispersed evidence into a dataset that was constructed to provide the largest possible degree of homogeneity across countries and over time.

Our new database includes more than 7,500 data points for an extended group of 23 manufactured products, grouped in 11 categories, in 41 countries, colonies and dominions for some selected years during the period 1846 to 1880. The dataset was compiled from the collection of Parliamentary Reports on Foreign Duties (British Board of Trade) and other Parliamentary papers for several years which capture the changes in specific and *ad valorem* duties on manufactured products around the world. Specific duties were converted into *ad valorem* rates by applying British export prices.

British export prices were set in an open competitive market, and presumably to the standard product variety produced and traded internationally –they are the closest possible equivalent to a world market price. For other countries, comparable average prices are either not available (most of the 'open', but less developed countries of the period) or likely to be influenced by the level of protection that distorted demand for product varieties through the tariff structure.[9] In general, in view of the limitations of

[9] Cf. the comment by Harley, "Antebellum Tariff,", esp. p. 800, on Irwin and Temin, "Antebellum Tariff" regarding the difference in the average price of cottons exported from Britain and imported into the US. Prices in trade statistics outside Britain were often not market, but 'official' prices (Lampe, "Bilateral Trade Flows," pp. 97–100) and only recorded for effectively imported product varieties (thereby not

disaggregated price data of sufficient quality for all countries in our sample, we focus on measuring the levels and changes of tariffs that representative exporters were confronted. We want to leave aside their impact on domestic prices and incentives as might be possible in recent fully specified general equilibrium measures of manufacture protection.[10] Our approach connects closely to the classic comparative works of of the Board of Trade, the League of Nations and Heinrich Liepmann.[11]

Although our data are mainly drawn from British sources, we believe the figures are representative of the trade barriers that confronted the manufactures' exporters of most countries. Since we do not know the relative weight of our 11 industries in world commerce, this paper focuses on presenting unweighted averages over commodity groups for each country. We ranked the 11 industrial sectors for which we calculate ad valorem equivalents according to their relative skill intensity (following Tena), although the present work focuses more on the overall picture and only comment briefly on trends in dispersion and skill-bias of tariffs.[12]

Overall even excluding Britain, there was significant and geographically broad trade liberalization in the world before Cobden-Chevalier. Indeed, average tariffs fell during the 1850s, although little of it happened in Northwestern Europe. Subsequently, Cobden-Chevalier affected a substantial share of world trade and it reinforced previous unilateral liberalization trends. Nevertheless, the incidence of treaty-making in the

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taking into account items with prohibitions, which were relatively manifold , for example for low quality textile varieties in the 1840s and 1850s).

[10] Anderson and Neary, "Welfare"; Kee, Nicita and Olarreaga, "Estimating Trade Restrictiveness."

[11] Board of Trade, *Import duties* and *Comparative Incidence*; League of Nations, *Tariff Level Indices*; Liepmann, *Tariff Levels.*

[12] Tena, "Bairoch Revisited," uses 16 different sectors. See note 35 for a more detailed discussion.

1860s and early 1870s on manufactures tariffs seems to have been an exclusively European phenomenon. Thus, on the one hand, our view of trade liberalization is more optimistic about the period after 1846 than the conventional wisdom offered by Bairoch, Irwin and others, who are skeptical about significant liberalization before Cobden-Chevalier. On the other hand, we show how bilateralism after Cobden-Chevalier served to maintain this earlier liberalization dynamic, while countries not taking part in the 1860s treaty network on average did not further decrease their levels of protection. The movement to free-trade in the middle decades of the nineteenth century required a sequence of different instruments.

WHAT WE KNOW ABOUT WORLD TRADE LIBERALIZATION.

The best account of nineteenth-century manufacturing tariffs is still that of Bairoch. He shows that after the Napoleonic Wars, most European countries had either high levels of protection (Denmark, the UK) or straightforward prohibitions on most manufactured goods (Austria, France, Russia, Spain, Sweden). Outside Europe, Japan was still under its *Sakoku* regime of seclusion and the U. S. had moderately high tariffs. The only exceptions to the high protection rule, were the Netherlands (including Belgium), Switzerland, and Prussia; there *ad valorem* equivalents of customs duties below 15% prevailed. In 1875, the United Kingdom had established itself as a completely free trader in manufactures, with many other European countries following with very low *ad valorem* equivalents of customs duties (basically the same countries with low tariffs in 1820 plus Sweden), or at least moderate levels below 20% (Austria,

Denmark, France, Russia and Spain). Outside Europe, Japan became almost a free trader, while the U. S. duties increased both during the Civil War and afterwards.[13]

What happened between 1820 and 1875? In the United Kingdom the political debate between free trade and protection began with the end of hostilities in Europe. At first centered on agricultural commodities, that is, important inputs for labor during the countries' industrialization. The Corn Law of 1815 had prohibited the import of wheat and marked the beginning of a conflict between the interests of agriculture and industry that marked the following decades not only in Britain but on the Continent as well. However, British export manufacturing interests were recognized by the Board of Trade as shown by the Reciprocity of Duties Act (1823) that established reciprocal agreements with foreign governments for MFN treatment of goods and shipping. Irwin supports the idea that all these efforts failed and frustration and discouragement set the stage for the unilateral tariff reforms in the early 1840s that culminated with the repeal of Corn Laws in 1846.[14] Unilateral conversion to free trade in Britain was not complete because, during the 1840s and 1850s (and also afterwards), imports of exotic products like tea, tobacco, sugar, coffee, wine and spirits, were still very heavily taxed representing more than half of total British tariff revenue. The same was true for France.[15] Furthermore, as Nye pointed out, Britain maintained high tariffs on French wines and spirits.[16] Although Britain officially refused the use of discriminatory bargaining practices and immediately multilateralised bilateral outcomes of the negotiations that led to the Cobden-Chevalier

[13] Bairoch, "European Trade Policy," aptly summarized in Bairoch, *Globalization*, chs. 2 and 3, in particular Table 3.3, p. 40. This table also has Italy as a country with average manufacturing tariffs below 10% in 1875, lacks comparable data for 1820.

[14] Irwin, "Multilateral and Bilateral Trade Policies," p. 94, following Brown, *Board of Trade*, p.132.

[15] Tena, "Assessing the Protectionist Intensity," p. 107

[16] Nye, "Myth" and *War*.

treaty, there was still room for the British to offer cuts in a restricted number of dutiable goods, like iron, leather articles, silk wares and of course wine, thereby seducing the French.[17]

What was the influence of British liberalism on the Continent before Cobden-Chevalier? Apparently, British liberalization and the significant reduction of transport costs following the development of railways, telegraphs and shipping fostered foreign trade in the rest of Europe. As pointed out by Bairoch, *"The Continent's volume of exports, which had grown by 1.9% per annum between 1837/39 and 1845/46, increased by 6.1% per annum between 1845/47 and 1857/59. For this reason, these years were one of the three most favorable periods for export growth in the nineteenth century"*.[18] Bairoch and Irwin mention a few examples of trade liberalization during the 1850s: the U. S., Portugal, the Netherlands, Denmark and Switzerland, as well as Sweden and Belgium from 1856/57 onwards. These two authors, however, overlook the fact that commerce might have been spurred by the spread of free trade in Continental Europe.[19] Charles P. Kindleberger highlighted long ago that liberalization on the Continent drew on the British example and Cobden's European travels.[20]

In a recent provocative paper, Accominotti and Flandreau challenge the validity of the conventional chronology of nineteenth-century trade liberalization. They "*suggest that there was a period of unilateral pan-European trade liberalization, between 1830*

[17] Lampe, "Effects," p. 1015.

[18] Bairoch, *Globalization*, p. 22

[19] Bairoch, "European Trade Policy" and *Globalization*; Irwin, "Multilateral and Bilateral Trade Politicies."

[20] Kindleberger, "Rise of Free Trade."

and 1860." In their view, this that process was probably more effective than the new instruments of the 1860s, bilateral trade treaties.[21]

Outside Europe, the story of almost uniform liberalization between 1815 and 1875 requires qualification. In Latin America, most former colonies gained independence after the Napoleonic Wars. Subsequently they moved away from the Mercantilist preferential system and a regional custom union to a more open trade policy, in response to both British military and political assistance during their wars of independence moved and pro-commerce coalitions by merchants and plantation owners involved in tropical export trade.[22] Nevertheless, state-building and recurring wars required fiscal revenue, which in view of the prevailing low population densities was heavily dependent on the taxation of foreign goods arriving into the nation's ports.[23] Setting tariffs to revenue-optimal levels was, in the words of Victor Bulmer-Thomas, "*an art, not a science. Furthermore, the existence of numerous tariffs set at different rates – typically between 15 percent and 100 percent – on goods competing with domestic production gave ample scope for special pleading."*[24] Thus, while the discriminatory Spanish colonial system was quickly dismantled, subsequent tariff reforms left ample scope for local interest groups in industry and handicrafts that could exploit the protectionist side of tariff duties originally increased to raise revenue, leading to increasing protection of domestic manufacturing in the small, but growing markets of Latin American countries. A prominent example is the protection of the textile industry in Mexico, where initially revenue-oriented tariffs soon were

[21] Accominotti and Flandreau, "Bilateral Trade Treaties"

[22] Bairoch, *Globalization*, pp. 41–42.

[23] Bértola and Williamson, "Globalization"; Centeno, "Blood."

[24] Bulmer-Thomas, *Economic History*, p. 33.

accompanied by numerous non-revenue generating import prohibitions.[25] While comparative evidence on the evolution of tariff rates is scarce, it seems that commercial policy was much more domestically driven than in Europe, where liberalization gained pace through mid-century bilateralism, while the extent of commercial negotiations after the dismantling of the mercantilist system actually slowed down in Latin America.[26] These observations are actually similar to the evolution of tariffs in the United States, where commercial policy after the American War of Independence was motivated by both independence from the British colonial system and considerations in favor of promoting domestic industrialization in conflict with the interests of export-oriented plantation owners in the South.

Many other formally independent countries could not formulate their commercial policy independently. Most notably, China, Japan, Turkey and Persia practiced more or less voluntarily the "enforced commercial liberalism" of Japan,[27] meaning that they had tariffs not very different from those of free trade countries like Britain or the Netherlands. Direct military pressure or defeat led to liberal tariff regimes in China due to the Nanking treaty with Britain in 1842 and in Japan following the arrival of the famous U.S. expedition led by Commodore Perry in 1853. Others like Turkey or Persia, committed themselves via free trade treaties to abolishing monopolies and prohibitions, thereby reducing tariff rates to very modest levels.

In most of the rest of the world direct intervention through colonialism was predominant, and policies here also were marked by the dismantling of mercantilist

[25] Salvucci, *Textiles*; Clemens and Williamson, "Why were Latin American Tariffs." There is similar evidence for Argentina, Colombia and Peru in Bulmer-Thomas, *Economic History*, p.33.

[26] Pahre, *Politics*, pp. 366–67.

[27] Bairoch, "European Trade Policy," p. 155, and *Globalization*, p. 41.

policies. British colonial trade policy in the nineteenth century before 1846/49 was marked by a reciprocal preferential system and shipping monopoly between metropolis and colonies, discriminating against foreign powers, as evidenced by the Indian example: less than 1% of total goods imported into India came from geographical areas outside Britain or its other colonies. After 1846 and the repeal of the Navigation Acts, something similar to a free trade period began for most colonies, leading to "*an open-door policy […]. But from this date the difference in trade policy between the so called Crown colonies and the self governing colonies (Canada, Australia, New Zealand) became much more important. Most of these self-governing colonies did not follow the British road to liberalism and adopted relatively protectionist trade policies"*[28] While tariffs for most British colonies were set at low rates and remained so during the rest of the nineteenth century, the initially very low rated of self-governing colonies – between 2 and 6 per cent – changed from the mid-1850s in Australia – especially in Victoria –, but also in Canada, where there is also evidence of industrial protectionist tariffs being levied in those years.[29]

This short review of the literature on trade policy marks the agenda for the remained of our paper: Different sets of countries exhibit similar trends – a liberalizing trend following from the dismantling of mercantilist Old Regime institutions on the one hand, but mixed to different degrees with a propensity to protect domestic manufacture and to raise revenue on the other – but levels and extent of liberalization nevertheless seem to differ substantially between them. Therefore, in the following we group the different countries into "clubs" and compare levels and trends in tariff levels. Thereby

[28] Bairoch, "European Trade Policy," pp. 110, 137; see also O'Brien, "Intercontinental Trade," p. 80.

[29] Bairoch, "European Trade Policy," pp.148–49.

we establish a more systematic picture than the existing literature, both regarding sample size and granularity and comparability of tariff level estimates.

A NEW DATA BASE ON MANUFACTURING TARIFFS AROUND THE WORLD

Nearly all previous quantitative studies on trade liberalization in the nineteenth century have used evidence on grain tariffs, average tariffs, import/GDP ratios or trade growth, the work by Bairoch discussed in the previous section being the only major exception. Therefore, they do not offer micro-evidence for exogenous comprehensive trade liberalization. Only Lampe developed a database for tariffs on manufactured products for seven countries in selected years during the period 1859–1875.[30]

To construct a comprehensive data set of tariffs on manufactured goods around the world we take advantage of the British government, especially the Board of Trade's interest in trade institutions around the world. It lead to the publication of large surveys on the state and evolution of foreign commercial legislation in Parliamentary Papers from the collection compiled inJohn MacGregor's five-volume *Commercial Statistics* published in 1850 to the famous 1903 *Memorandum (with Tabular Statements) on the Comparative Incidence of Foreign and Colonial Import Tariffs on the Export Trade of the United Kingdom*[31] These reports provide exhaustive tables on foreign manufacturing tariffs by countries and products. The data presented here for individual years between 1846 and 1880 are mainly based on a report prepared by the Board of Trade under Sir Robert Giffen on *Rates of duty (foreign and colonial) on British manufactures or*

[30] Lampe, "Bilateral Trade Flows" and "Effects". For the construction of a variable this work was extended to 15 European countries in Lampe, "Explaining Nineteenth-Century Bilateralism,", but the tariff rates have not been published separately.

[31] Board of Trade, *Comparative Incidence*, part XVI..

produce in a large number of countries and colonies in 1860/61, 1870, 1875, and 1880.The data were extended back to 1846 using MacGregor, his underlying reports in the *Parliamentary Papers*, several updates of the latter, as well as data compiled by contemporary authors, original trade statistics of Austria-Hungary, Belgium, Denmark, the Netherlands, and the Zollverein, and information from Prussian official sources in their official commercial periodical *Preussisches Handels-Archiv*, often compiling information from similar publications in other countries.[32]

Using these sources allowed us to fully cover the trade regimes for our 11 commodity groups (see Table 1) for almost all countries in most of the benchmark years 1846, 1853, 1859, 1863, 1870, 1875 and 1880. Our database also contains many data points for years between these benchmark years, but we have not used them at this stage to ensure full comparability over time. However, in the future we hope to be able to provide complete time series, a task that basically depends on identifying the date (year) of the modification of all individual tariff rates covered in the benchmark years.

The 'britanocentrism' of our sources imply that the rates we report are for British manufactured products. This is important for 1846, when the preferential system for British products in the colonies was still in force. Even then the impact would be modest, as preferential tariffs for British colonies were abolished between 1849 and 1853. Bilateralism returned after 1860, when treaties following Cobden-Chevalier established 'conventional tariffs' (based on 'tariff conventions', that is, bilateral treaties)

[32] The different reports in the Parliamentary Papers can be identified from the *Subject Catalogue* by Cockton, category: 'Trade and Commerce. Import and Export Duties. Tariffs.' Additional sources were Hübner, *Zolltarife* and *Zolltarife Zweite Auflage*, and Lack, *French Treaty*. for Latin America, we additionally crosschecked our information with De la Cuadra, "Antecedentes," for Chile, Kuntz Ficker, *El comercio exterior*, and Cruz Barney, *El comercio exterior*, for Mexico and Laurent, *Contrabando*, pp. 282–83, 288, 317, for Colombia.

that were lower than the 'autonomous tariffs' a country's customs legislation imposed on non-treaty partners' imports. As Lampe has shown fears of discrimination accelerated the spread of bilateralism after 1860, thus the preferential treatment under the Cobden-Chevalier unconditional most-favored-nation clause was quickly generalized. At most then, a country's exporter would have had to wait until 1870 to experience the lower rates available to British exporters in 1863.

In most places and years, tariffs were imposed as either *ad valorem* rates or as specific duties even though sometimes they appeared as a combination of both (see table 2).[33] Specific duties were denominated as monetary values for a certain national unit measure of volume, area or weight for which English equivalents were usually provided.[34] Thus the first challenge was to convert these specific duties into *ad valorem* equivalents comparable across countries and over time. Doing so requires prices. Given

[33] A special, and problematic case, are *ad valorem* rates that were imposed and reported in the sources we use, but where the value could be subject to changing *fixed values* stipulated by local or national authorities, so they were not necessarily levied on the actual value of a product. This meant that rates in practice were more specific than *ad valorem*, the *ad valorem* rate in the tariff scheme being only a rough orientation. This system can be found in some Latin American and other peripheral countries and was practiced because authorities did not believe in the invoice values reflecting the actual price of the product. MacGregor, *Commercial Statistics*, (or the consuls whose reports he transmits) repeatedly highlights arbitrary valuation procedures in backward countries; see, for example, about Greece, ibid., vol. II, p. 190, and about Morocco, ibid., p. 288: "The import duties are sometimes arbitrarily raised, and they are often corruptly levied; but 10 per cent on the value is the general rate of import duty: the value is, however, often underrated, by means of bribes or otherwise.")

[34] The main exception are textile duties specified for yards (or *varas*) of cloth instead of units of weight. Here, we follow, Board of Trade, *Comparative Incidence*, p.170: "After careful inquiry, an average weight of 5 yards to the lb. has been assumed. In the same way an 'average count' of 40 has been assumed for cotton yarns. In the case of woollen and worsted piece goods average weights have been estimated varying from 18 ozs. to the yard for heavy broad woollen piece goods and worsted coatings, to 5 ozs. to the yard for mixed worsted stuffs. Linen piece goods have been taken as 35 lbs. to the 100 yards."

At different points in time, Victoria and New Zealand had duties (or 'registration fees') per cubic foot on several items. We have decided to use British standard transport/stowage conversion rates for light goods of 50 cubic feet to the ton to convert this volume measure into weight (Stevens, *On the Stowage*, pp. 31, 303, etc.).

the number of products involved, we could not match specific duties with prices perfectly. First, we organized the data into 11 sectors following recent work by Tena.[35] These sectors represent the bulk of manufactures traded and span products of different skill intensities. Secondly, we collected the quantities and values of exports from the British trade statistics for the corresponding products or groups from 1846 to 1880. Thirdly, we computed implicit prices (unit values) for all these products (23 in total) and averaged them out within each sector. Fourthly, we extrapolated some price series back to 1846 using Augustus Sauerbeck's series.[36] Finally, we divided all specific duties by their respective prices or, whenever missing, by their respective average sector prices.[37]

We acknowledge that by applying British export prices, we bias the *ad valorem* tariffs upwards. Indeed, using British prices assumes that the F.O.B/C.I.F. price differential was low for most manufactured products according to recent estimates, which is justified by their above average value-to-weight ratio.[38] In addition, it is far

[35] Actually, comparing to Tena, "Bairoch Revisited," five groups were excluded due to lack of data: ships, machinery & hardware, chemicals, apparel, and jute and hemp. For chemicals (bleaching powder and alkali) and hemp we have prices, but dealing with the tariff rates was problematic. Both problems reflect the fact that most of the products included in these categories were relatively unimportant in international trade before 1880.

[36] Sauerbeck, "Prices."

[37] See online appendix A.1 for a complete dataset on prices.

[38] Federico and Tena have estimated for their ongoing research project on *The Growth of World Trade 1800-1940* cif-fob conversion ratios for manufactures (including insurance) between 1848 and1880 for 12 different shipping routes in four different continents. The average cif-fob differential for the whole period in the world would be 4.2% (with a minimum of 3.2% and a maximum of 6.9% during the period). The average differentials for regional areas would be 4.2, 3.9, 4.3 and 4.3 per cent for Europe, Africa, Asia and Latin America, respectively. The estimates are based on Angier's general UK manufacture outbound freights in *Fifty Years' Freights*. This series indicates a stable conversion ratio of 1.5 between freight rates for manufactures and those for coal for different international destinations. Coal freight rates have been transformed into freight rate series for manufactures from 1848-1880 by dividing them by the UK export cotton yarn unit value and adding insurance, assumed to be 2% of value in 1900 and moved

from clear whether ad valorem tariffs were always levied on C.I.F. prices, or whether F.O.B. invoice values were sometimes used. As noted in the introduction, this implies that our dataset is a better measure of barriers for exporters than of protection for import-competing domestic producers.

Table 1: Construction of Price Series

Sectors with complete price series 1846-1880		
Woolen Manufactures: Woolen piece light all wool; Worsted stuffs all wool; Woolen clothing - flannels Linen Manufactures: Linen Piece goods Cotton Manufacture: Cotton piece bleached; Cotton piece printed Woolen Yarns: Worsted yarn Linen Yarns: Linen yarns unbleached Cotton Yarns: Cotton thread for sewing Iron & Steel: Pig Iron; Steel bars, angles, shapes		
Sector with incomplete price series		Data available
Paper	Paper hangings; paper for writing	1854-1880
Leather	Calf Skins	1854-1880
	Boots and shoes of leather	1862-1880
Copper	Copper ingots, Cakes, Slabs	1854-1880
Silk Manufactures	Silk, thrown;	1846-1870
	Silk manufactures	1846-1860

Source: see text

Note: the missing data are extrapolated using a variety of Sauerbeck's indices. The paper series and leather series are extrapolated back using the Grand Total Indexin Sauerbeck, "Prices", app. D, p. 648; For Copper, the "Copper" series, ibid., app. C, no. 22, p. 645 was used. Silk, thrown was extrapolated to forward to 1880 using the "Silk" series, ibid., app. C., no. 34, p. 646. Silk manufactures were extrapolated based on our series of "Silk, thrown".

Our main argument for the use of British export prices is that they offer better relative price estimates than the more or less arbitrarily fixed import values reported in

backwards with their respective shipping freight rates by route (for the insurance of British cotton exports in the 1850s see Llorca-Jaña, "To be Waterproof.".

many official statistics of less developed countries. As we noted earlier, they are also less distorted by trade barriers than the import prices of countries that applied tariff barriers against British manufactures or prohibited the importation of a significant number of product varieties, as was the case for example in France before 1860.[39] Finally, British export prices do correspond best to the product variety/quality for which we have collected specific tariffs, so that we see no viable alternative to using them if the dataset is expected to be consistent over time and comparable between countries.

Additionally, some countries, namely Spain and Mexico, imposed prohibitions on entire commodity groups.[40] Without assigning them some tariff level we could not include them in our estimates of average protection, leading to downward-biased estimates of their levels of protection. However, there is evidence that these prohibitions, as well as very high "super tariffs", induced smuggling in many countries such as Colombia, Mexico and Spain, thereby partially neutralizing their formal purpose.[41] Since our main objective is to measure exogenous changes in commercial policy, not endogenous changes in the effects of protectionism, we assigned a rate of twice the specific or *ad valorem* rate for the first period when imports were allowed, for all prohibitions. In other words, we take abolishing a prohibition to be equivalent to halving a prohibitively high tariff. This approach was inspired by a circular of the

[39] See Harley, "Antebellum Tariff," on U.S. cottons and Lampe, "Explaining Nineteenth-Century Bilateralism,." App. 2, on prohibitions.

[40] Prohibitions (substituted with twice the specific or *ad valorem* rate in the first period after repeal). The rate given below is the one included for our calculations in current prices Mexico: Leather: 1846: 283%, 1853: 265%; Copper: 1846: 145%, 1853: 145%; Cotton Yarns: 1846: 213%, 1853: 220% Spain: Leather: 1846: 116%; Cottons: 1846: 200%; Cotton Yarns: 1846: 224%.

[41] During the years 1846-1860 around 50% of total imports into Spain from Britain were smuggled from Gibraltar and Portugal (see the estimate made by Prados de la Escosura, "El comercio hispano-británico," p.151). It is difficult to evaluate the effects of prohibitions (with high smuggling repression) and extremely high tariffs (with low smuggling repression) on changes of real protection during these years. For the case of Colombia see Laurent, *Contrabando*.

Spanish customs authorities (5 July 1864), which decided –that while the import of knitted cottons was prohibited, when they were declared *bona fide* for importation, they could be imported paying twice the duty for the corresponding woven cottons.[42]

Another problem stems from the extremely high tariff rate calculations which arise from prohibitions of imports of lower value items in a commodity group (such as low count cotton yarn in France before Cobden-Chevalier and many items in Russia before 1859), while tariffs apply to high value varieties but are divided by the relatively low unit value of British exports.[43] If our calculated duties were higher than 300%, we have applied a cap and set the value to 300 to avoid distortions. In all, this involved coding of equivalents of nine prohibition data points and application of the 300% cap in nine cases, all heavily clustered in 1846 and 1853 and in few countries.[44]From the rates obtained for the 11 individual groups we have calculated unweighted average tariffs for each county by period, following the tradition of the Board of Trade itself, the League of Nations and Liepmann.[45]

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[42] *Preussisches Handels-Archiv* 1864/II, p. 189: "Verzollung gewirkter baumwollener Waaren in Spanien (Mon. univ. Nr. 224)." We have tried to solve the problem in other ways, for example,using price differentials or examining British exports to countries with very high tariffs in the corresponding years. Unfortunately, trustworthy data for international price comparisons between peripheral countries and trade with them in the first periods of our dataset (1846/1853) is too scarce. This also renders more systematic approaches impossible, for example, following Beghin and Yue, "Tariff Equivalent," or Kee, Nicita and Olarreaga, "Estimating Trade Restrictiveness," not to speak of calibrated general equilibrium models.

[43] *Ad valorem* equivalents higher than 300% in current prices where the 300% cap was applied: France: Cotton Yarns: 1846: 337%, 1853: 349%, 1859: 331% ; Portugal (1846): Linen Yarns 482% ; Russia (1846): Iron and Steel 314%, Leather 371%, Linens 1467%, Cottons 486% Russia (1853): Linens 368%.

[44] We abstained from trying to estimate the *ad valorem* equivalent of the Japanese seclusion policy before 1859, and also did not calculate equivalents of port use restrictions prior to 1867/8.

[45] Board of Trade, *Import duties* and *Comparative Incidence*; League of Nations, *Tariff Level Indices*; Liepmann, *Tariff Levels*. We have also calculated a weighted average across commodities based on British export shares, as reported in online appendix A.3. Although these British export shares are not necessarily representative of the world's or each country's demand, they can still be interpreted as a measure of "trade resistance" to British industrial exports.

The database covers a wide geographical area, encompassing most regions of the world. Its 41 countries and dependencies were organized into six groups: 'Rich Europeans', 'Poor Europeans', 'Independent New Settlers' (that is, United States), 'Semi-independent New Settlers' (Australia, Canada and New Zealand), 'Independent Poor' (Latin American countries), and 'Dependent Poor' (including colonies and independent, but compulsory liberalized countries like China, Japan, Turkey, Morocco, Tunisia and Zanzibar). This classification is arbitrary but it follows an explicit criterion: we define as poor those countries with a 1870 GDP per capita less than half the U.K's (the richest country in the world), according to Angus Maddison.[46] See below how countries were allocated into these six groups. In the following section, we present the unweighted average of the average tariffs of each group. Table 2 shows for which countries we have full data and in which of our seven benchmark years.

[46] Maddison, *The World Economy*.

Table 2: Data Availability

"Club"	Country	Years Missing	Tariffs were
Rich Europe (EuroCore)	Belgium		Specific
	Denmark		Specific
	France		Specific
	Netherlands		Both
	Switzerland		Specific
	Zollverein (Germany)		Specific
Independent Settler	USA		both/mix
Poor Europe (EuroPeriphery)	Austria-Hungary		Specific
	Greece		mostly specific
	Italy	1846, 1853, 1859	Specific
	Moldovia-Wallachia/ Romania		ad valorem, 1880: specific
	Norway		Specific
	Portugal		Specific
	Roman (Papal) States	1875, 1880	Specific
	Russia		Specific
	Sardinia	1863, 1870, 1875, 1880	Specific
	Spain		Specific
	Sweden		Specific
Semi Independent Settlers	Australia (Victoria)	None but 1846=NSW	ad valorem
	Canada		ad valorem
	New Zealand		specific
Poor Independent	Argentina (Buenos Aires)	1846	ad valorem
	Brazil		mainly ad valorem
	Chile		1846 specific, then ad valorem
	Colombia (New Granada)		Specific
	Mexico		Specific
	Peru		ad valorem, 1880: specific
	Uruguay		ad valorem
	Venezuela		Specific
Poor dependent (including. compulsorily liberalized independent)	China		specific (based on ad valorem)
	Cuba		mainly ad valorem
	Dutch East Indies (Java)	1853	ad valorem
	Hong Kong		no tariffs
	India		ad valorem
	Jamaica	1846	ad valorem
	Japan	1846, 1853	ad valorem
	Morocco		mainly ad valorem
	South Africa		ad valorem
	Tunisia	1846, 1853	ad valorem
	Turkey (including Egypt)		both

Source: see text / own work.

Note: Moldavia and Wallachia had identical tariff rates before the united as Romania; Sardinia refers to all of Piedmont-Sardinia. The last column informs whether tariffs were levied in *ad valorem* (percentage of value) or specific (rate per unit of weight or volume) form. 'Both' means that some commodities were rated ad valorem, others not. 'Mix' means that at least some commodities were subject to tariffs that had a specific and an ad valorem component.

When aggregating all countries into a world average, we have opted for the calculation of a weighted average, using shares of world trade or population in 1879. Each country's share in world imports in 1879 according to Giffen.[47] This is the most detailed estimation of the geographical division of world trade (including colonies) for the period under study, and a better alternative to the conventional contemporary GDP estimations, at least in the case of poor countries. Each country's share of world population was taken from Maddison.[48] All in all, our database permits an evaluation of tariff protection around the world from 1846 to 1880, thereby highlighting the possible effects of Cobden-Chevalier, or their absence.

[47] Giffen, "Use," pp. 255–58.

[48] Maddison, *The World Economy*.

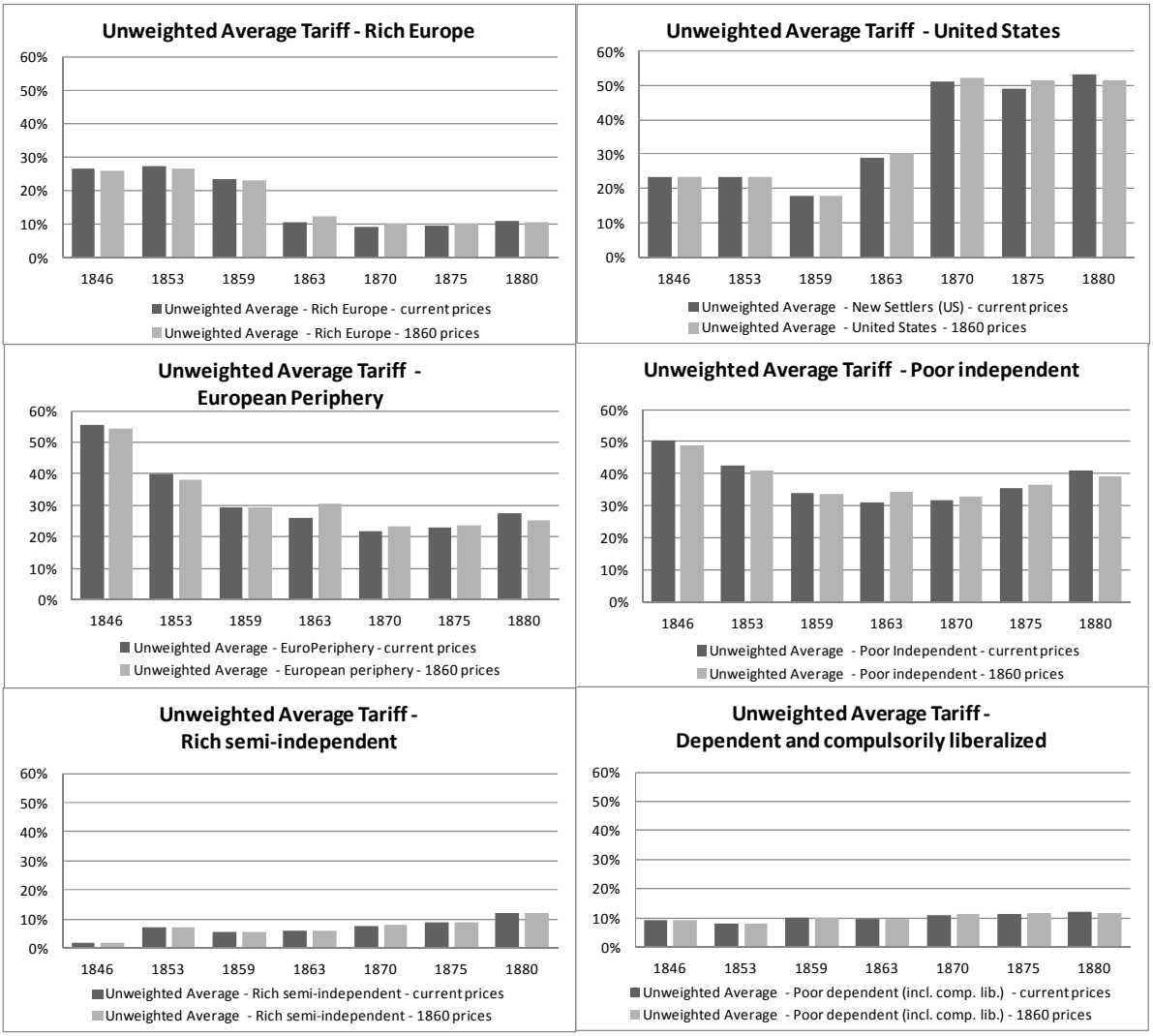
HOW MUCH TRADE LIBERALIZATION HAPPENED IN THE WORLD?

In the following, we focus on comparing country club and world trends in tariff levels and changes between 1846 and 1880, focusing on the periods before and after the Cobden-Chevalier treaty of 1860. Although national episodes are extremely interesting, a systematic comparison is outside the scope of the present paper.[49]

Figure 1 indicates, first of all, the surprising variety in tariff levels and movements between country clubs and over time. It shows that Cobden-Chevalier was an exclusively European phenomenon. On the continent, the average tariff moved very little during the late 1840s and 1850s and then fell from 23.3% in 1859 to 10.6% in 1863 and 9.3% in 1870. We can also see that, at least as early as 1853, a trend away from high tariff barriers was underway. Moreover this trend was more pronounced in the poorer countries of the European periphery and Latin America than in the European core of the world economy. This trend towards lower trade barriers was also shared by the United States with the relatively liberal 1857 tariff.

[49] The national average rates per country can be found in online appendix A.2.

Figure 1: Unweighted average tariffs computed with current and constant 1860 prices, 1846-1880



Sources: see online appendix A.2 and A.3 for underlying data. 60% set as maximum for display purposes. Unweighted average over all commodities and countries.

The impact of Cobden-Chevalier in the European periphery was, however, much smaller and limited to some countries (Scandinavia, Austria, the Italian States, and, later, Spain). Some of these did not liberalize so much through treaties, but by making unilateral reforms (especially Spain), while Portugal, Russia and Greece followed the tide only reluctantly or not at all. Also, while the European periphery "liberalized" before and after 1860, actual duties remained on average much higher (in 1859, 29.5%

in 1870, 21.8%) than in the European core. In fact tariffs on the southern periphery after 1860 are similar to those of the European core in 1859. In contrast, Scandinavian countries changed from a more peripheral to a more core pattern over time and by 1870, their average tariffs had dropped all the way to 7.6% for Norway and 10.3% for Sweden in 1870.[50] Italy (8.7%) also followed a similar pattern.[51] After 1870, Europeans went in reverse. As a result of national industrialization policies, trade protection increased. This time, however, the process was more severe in the poorer periphery than in the richer core. There the average level only increased to 11% in 1880.

New Settlers (the U.S. as well as the increasingly self-governing British colonies, although to a much lesser degree) and Latin American countries (Poor Independent) actually show an increase in tariff levels after 1860, clearly indicating that European liberalization, including Cobden-Chevalier were of little importance to them. In Latin America, average tariffs fell from 50.5% in 1846 to about 30.8% in 1863, only to increase again, to 41.1% in 1880. These countries were more susceptible to altering their duties to meet domestic fiscal imperatives. After years of political instability, central governments could only turn to foreign trade support their growing fiscal needs. Tariff levels followed political cycles. Finally, the colonies, dominions and formally independent states subject to what Bairoch named 'compulsory economic liberalism' confirm the conventional wisdom. Their average rates were below 10% in all periods for almost all countries and the impact of self-governance in Australia, New Zealand and Canada was small. The Dutch East Indies did have a 20% average in 1846, and Cuba, a colony of high-tariff Spain, was the only one where rates rose from 26% in

[50] On Scandinavia and Cobden-Chevalier see Lampe and Sharp, "Something Rational."

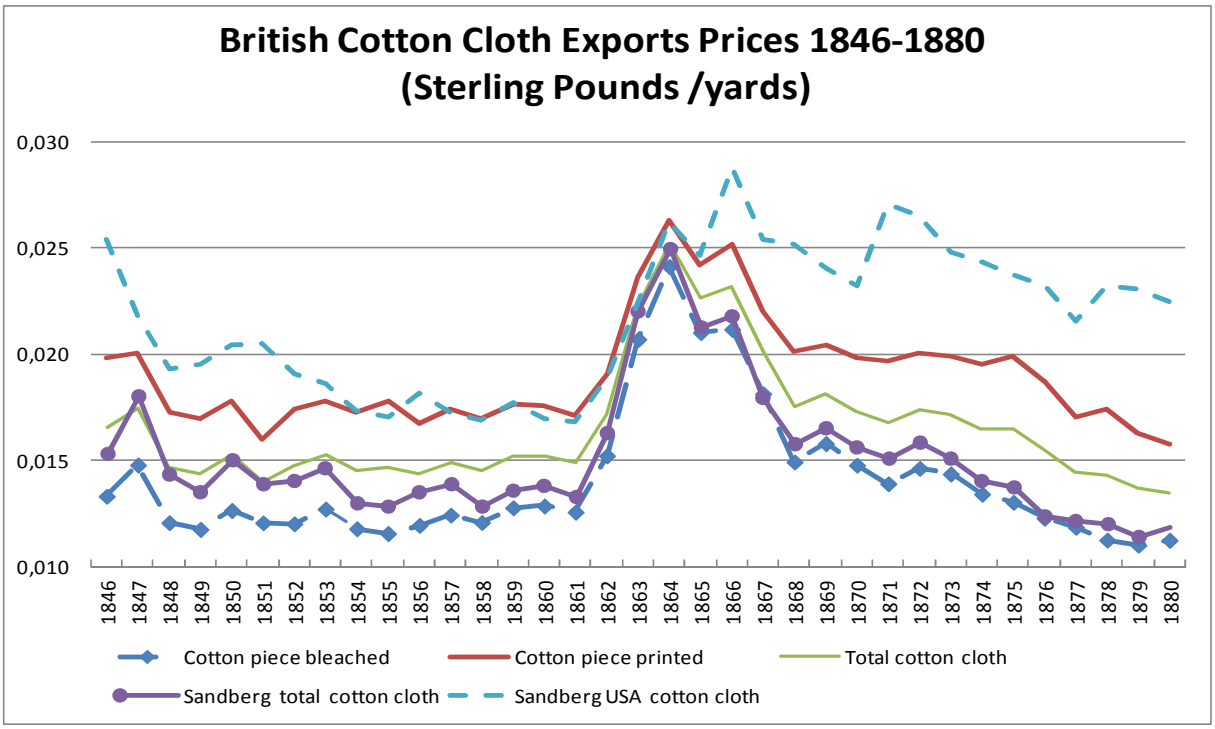
[51] Federico and Tena, "Was Italy?"

1846 to 70% in 1880. In fact Cuba behaves quite like the newly- independent former Spanish colonies.[52]

Since most nineteenth-century tariffs were specific duties denominated in national currencies, it is important to investigate whether tariff protection changed over time because of conscious decisions of governments to modify these specific duties or whether this process was more the result of constant duties and changing prices. When we recomputed the average tariffs using prices fixed at 1860 – see Figure 1 – a few changes appear. To be sure, the levels change slightly and any decline in protection in the European core before 1860 and in the poor periphery between 1859 and 1863 disappears. Thus it is likely that the increase in textile prices due to the American Civil War helped to moderate protection in those years even if governmental policies, rather than movements in prices, shaped the picture.

[52] Morocco shows averages of 13 to 18% before 1860, which are caused by a specific rate on iron that leads to an *ad valorem* equivalent that is much higher than the otherwise applied 10%rule.

Figure 2



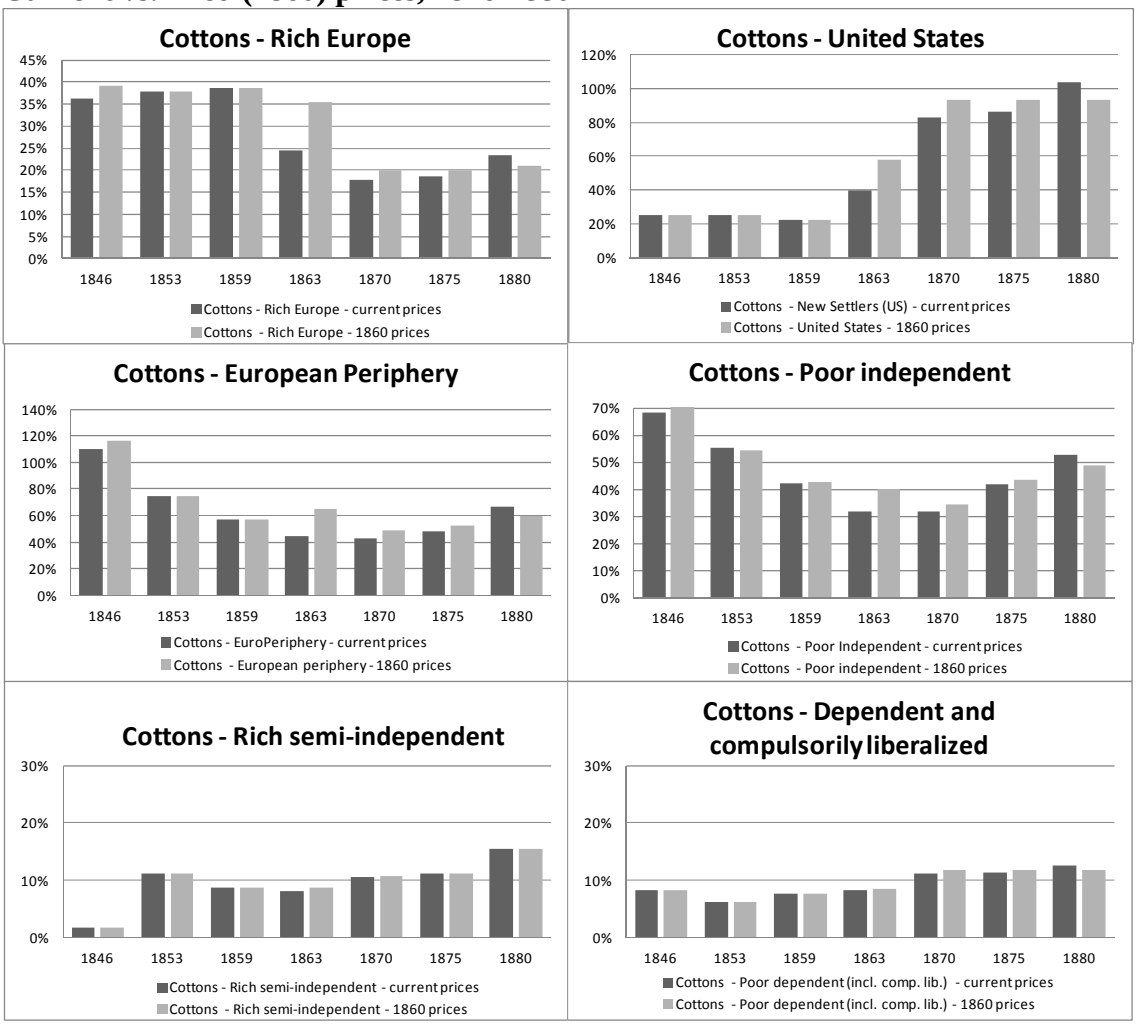
Sources: Cotton piece bleached and printed from online appendix A.1; 'Sandberg total cotton cloth' and 'Sandberg USA', that is, average prices for British exports to the U. S., from Sandberg, *Lancashire*, Appendix. D.

One area where prices mattered was textiles, especially cottons. Figure 2 shows the comparative evolution of the prices for bleached and unbleached and for dyed and printed piece goods of cotton manufacture price in our data base versus the well-known cotton cloth prices collected by Lars G. Sandberg (that should be an average of bleached and unbleached and printed and dyed cotton piece goods also from British export statistics).[53] Sandberg's price in 1846 and 1853 is almost identical to our cotton cloth average prices, but in 1859 it is closer to our price for bleached and unbleached cottons, again very similar to both in 1863, and once again closer to the latter series in 1870,

[53] Sandberg, *Lancashire*, App. D, pp. 252–62, presents what he calls *British cotton textile exports by countries* in values and quantities. This cloth price rate is measured in pounds sterling per yard of the ratio sum of USA, France, Brazil and India respective quantities and values.

1875 and 1880.[54] As expected, the movements of the indices are very similar also from 1854 onwards: both peak in 1864 and both fall from 1864 to 1870 at same time as cotton tariffs first fall and then rise (see Figure 3).

Figure 3: Average tariffs on cotton manufactures (piece goods), unweighted. Current vs. fixed (1860) prices, 1846-1880



Sources: Tariff database. See text.

On the one hand, as expected, in the 1850s stable cotton prices could not provide the impetus for the liberalization of the poor European periphery and Latin America.

[54] Following Harley, "Antebellum Tariff," we have included Sandberg's prices for cotton cloth exports to the US in Figure 3 to show that we are aware of the cotton import substitution and demand bias created by the US ad valorem cotton tariff from 1846 onwards (and by the minimum valuation before the Walker tariff of 1846). The price differential increase between British cotton exports to US and to the rest of the world widens drastically after the North American Civil War.

Moreover, in this period reductions in cotton tariffs, that is, changes in specific rates stipulated by law, were exceedingly rare in the European core before Cobden-Chevalier. That is what the 'fixed price' column of column Figure 4 shows. This inertia fits very well with the conventional accounts of commercial policy history for Europe before the outbreak of Cobden-Chevalier bilateralism.[55]

On the other hand, Figure 3 shows how the exceptional rise in raw cotton prices following the American Civil War magnified the effect of decreasing specific tariff barriers. This was especially true in Europe where the Cobden-Chevalier network expanded rapidly. The decrease in *ad valorem* equivalents of tariffs on cotton textiles until 1863 was clearly more due to an increase in the denominator (prices) than to a fall of specific tariffs in the numerator. For other textiles, a similar, though smaller, effect also appears. The influence of prices on *ad valorem* protection is also important in the second half of the 1860s when the second round of bilateral tariff agreements was probably compensated by the large reduction in prices.[56]

The foregoing conclusions are subject to one caveat. Because we use specific duties in pounds sterling which do not provide data in national currencies for all years and countries, we cannot disentangle the effect of changes in the exchange rate as a source of protection or liberalization during this period. We observe that the exchange rates used in the British reports are constant rates which seemed to be based on the mint parity between currencies. This implies that the depreciation of currencies against the mint parity might have lowered the tariff level faced by exporters to that country if the stipulated duties were specific. We have not systematically corrected this potential bias

[55] See, among others, O'Rourke and Williamson, *Globalization,* p. 38, and Bairoch, *Globalization,* p. 22.

[56] Our data base prices (see online appendix A.1) show for linens and woolens and worsteds a more moderate price increase in the early 1860s than for cottons, but both were also affected by the impact of the American Civil War.

for two reasons: the first is that accessible exchange rates (as collected by Markus Denzel[57]) are for 'cashless payments,' while customs duties especially in peripheral countries (for example, Mexico, Venezuela, China)[58] had to be paid in cash, that is with precious metal coins.[59] The most prominent example is the paper currency issued during the U.S. Civil War (greenback dollar). The Legal Tender Act of 1862 defined it as legal tender for payment "*of all taxes, internal duties, excises, debts […], except duties on imports*", which still had to be paid in cash (specie dollars). The second reason is that in most countries where duties were specific, essentially those in Europe (see Table 2), exchange rates were essentially stable. The exceptions to these rules are, to our knowledge, Russia and China. In Russia, after 1877, customs duties had acquitted in gold, (presumably before that they could be paid in paper rubles).[60] For China, as the world gold-silver price started to rise substantially after 1873 (when German and France both went on to gold), the Shanghai tael, the silver-based currency used in the Maritime Customs Office, slowly lost value relative to the pound sterling.[61] This might also apply

[57] Denzel, *Handbook.*

[58]

[59] Hübner, *Zolltarife Zweite Auflage,* gives an overview for most countries in the world about the modalities of customs duty payments in the mid-1860s. While cash payments were very common, some cases are more complicated, for example, in Colombia duties had to be paid in a mix of internal and foreign debt certificates and gold and silver coins; see ibid., p.213.

[60] Bairoch, "European Trade Policy," p. 62. If we assume that this depreciation followed the sterling-ruble exchange rate quoted in Denzel, *Handbook*, pp. 370-71, and started with the Crimean War, then the rates in online appendix A.2 should be 44.5% instead of 48.8% (1859), 46.3% instead of 54.4% (1863), 37.7% instead of 48.9% (1870) and 43.3% instead of 50.6% (1875), while for 1880 we would assume the rate to be "at par". These results are in line with Bairoch's observation that charging in gold increased tariff levels by about 32% in 1877, when the credit ruble was more devalued than in 1875.

[61] For the commercial gold-silver-rate in London see Flandreau, *Glitter*, pp.6, 243. For the official Shanghai tael to pound sterling exchange rates see Denzel, *Handbook*, pp. 509–10. If we account for depreciation since 1873, the Chinese tariff rates would be slightly lower than indicated in Table A.2: 5.3% instead of 5.7% in 1875 and 5.6% instead of 6.4% in 1880. For an account of the spread of the gold standard see López-Córdova and Meissner, "Exchange-Rate Regimes."

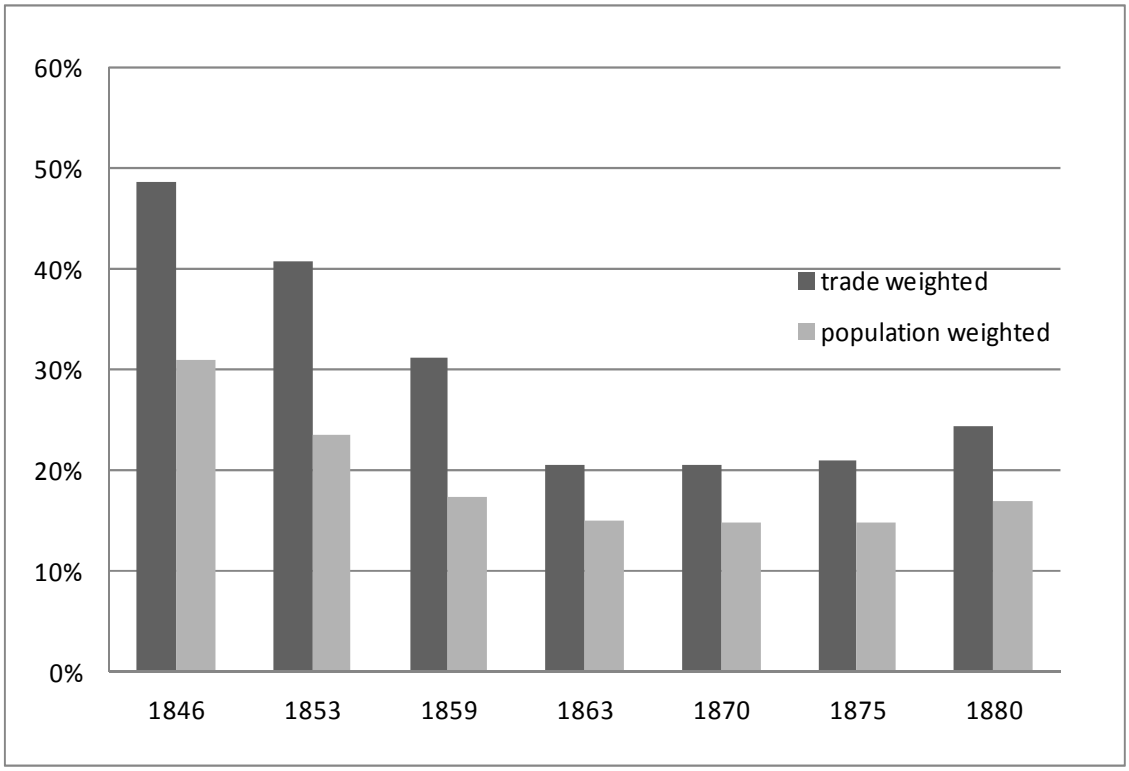
to other silver-based currencies such as the Mexican peso, for which, however, we lack valid specie-exchange rate information. Overall, the effect of changing exchange rates during the 1850s and 1860s is small, and after 1870 the spread of the gold standard, is important but it would not seriously affect the patterns we have found.

Returning to Figure 1, it is clear that Cobden-Chevalier was an exclusively European phenomenon. Tariff protection decreased in both the core of rich countries and with some delay in at least some parts of the European periphery. In the rest of the world, trade protection evolved in a different way. In the United States, tariff barriers actually increased from the late 1850s and early 1860s to the 1870s. For Latin America, liberalization was a pre-Cobden-Chevalier experience and return to protection started as early as the 1860s. Since Europe was at the center of the nineteenth-century economy, we need to ask what the effect of European liberalization was on world tariffs.

Looking at Figure 4 we see that the movements of the 'world tariff' average are very similar whether we weigh countries by their share of world population or of world trade. Before 1860, the 'world tariff' declined from 49 to 31% if weighted by trade shares, and from 31 to just 17% if weighted by population. The differences reflect the fact that large parts of the world population lived under regimes of 'compulsory liberalism', implying that both the 'trade per person' and the tariff levels of these territories were below those of richer countries. This was particularly true for China and India. By 1870, world levels fell to 21% if weighted by trade and 15% if weighted by population. Then from 1870 to 1880 we see a slight increase by 2 to 4 percentage points. This indicates that there might have been 'globalization backlash' for

manufactures after 1870, but in comparison to the (European) reactions to the 'grain invasion' it seems to have been rather mild.[62]

Figure 4: World tariff average on manufacturing trade, 1846-1880



Sources: see online appendix for underlying data. Weights are shares in total trade and population by countries respectively, in 1879. The rates for each country are the unweighted rates.

So, did Cobden-Chevalier matter? If we compare the 'members' of the Cobden-Chevalier network – defined as those who concluded at least three treaties with unconditional most-favored nation clause before 1870 - to 'non.members' among the independent countries in our sample, the following picture emerges (Table 3): [63]:

[62] See O'Rourke and Williamson, *Globalization*, pp. 97–105) and the works cited there for a comprehensive discussion of 'globalization backlash' in agriculture.

[63] We used the list of contracts by countries in the working paper version of Lampe, "Effects," appendix 1, and count as 'members': Belgium, France, Netherlands, Switzerland, Zollverein (Germany), Austria-Hungary, Italia (Sardinia), Norway, Roman (Papal) States, Spain, and Sweden; while Denmark, USA,

Table 3: The Cobden-Chevalier Network and the Evolution of Tariff Rates

	Tariff change 1846-59	Tariff level 1859	Tariff change 1859-70	Tariff level 1870	Tariff change 1870-80
Cobden-Chevalier	-29%	36%	-48%	13%	17%
Non Cobden-Chevalier	-12%	40%	17%	32%	31%

Source: online appendix A.2; see text.
Note: Changes are changes in percent, not percent points.

Cobden-Chevalier mattered, but liberalization was underway in the participating countries at least since 1846. The countries taking part in Cobden-Chevalier liberalized more before and during the 1860s than the other independent countries in our sample.[64] Indeed, between 1859 and 1870 the average liberalization was larger than that achieved in each of the eight GATT rounds between 1947 and 1994.[65] , At the same time, non-treaty countries moved (on average) towards more protection, increasing tariffs by 17% and 31% in 1859-70 and 1870-80, respectively. exceeding This suggests that there were no simultaneous "two ways" to liberalization, and that the movement to free trade developed step by step employing different instruments.

Greece, Portugal, Romania, Russia, Argentina, Brazil, Chile, Colombia, Mexico, Peru, Uruguay and Venezuela are 'non-members' In 1846-59 we do not include Switzerland under Cobden-Chevalier since its calculatory increase by 658% (from 0.4 to 2.9%) was the outcome of a complete change in the customs system between 1849 and 1851 that did not actually involve an increase in protection, but a unification of the customs territory; Polli-Schönborn, "Zölle."

[64] A look at Figure 1 and the underlying data reveals that liberalization was probably faster on average among the European periphery countries during the 1850s, while during the 1860s the cuts in tariff rates were largest in some of the richer countries.

[65] Jackson, *World Trading System*, p. 74, gives the average tariff cut on non-primary goods in industrial countries as 34% to 38% between the Geneva and the Uruguay round.

STRUCTURE AND DISPERSION OF TARIFFS

As can be observed from Figures 1, and 3, tariffs for cotton manufactures were much higher than the simple average over all commodity groups. There are several possible reasons for this. Most importantly, countries (outside the British Empire) might have reacted to British comparative advantage in textile production by defensively protecting their industries. If so they would have biased their tariff structure against those products that the British were most desirous of selling.[66] They might also have been disproportionately protecting either those sectors where value added and spillover potential were highest (a 'positive skill-bias' according to Nathan Nunn and Daniel Trefler)[67] or domestic lobby groups or "national labor" were best organized, potentially causing a "negative skill bias".

We can use the detailed information at industry level in our dataset to shed some preliminary light onto these questions. First, we can look at the level of dispersion in tariff rates, that is, their variances across commodity groups to see which countries had more diversified tariff schemes, potentially reflecting more active commercial policy. Let us examine the coefficient of variation, which corrects for the fact that countries with high tariffs are also likely to have high variances across products. All points in time, European countries, rich and poor(er), seemed to pursue a much more active trade policy in the sense that the coefficient of variation of their rates is much higher than that of the rest in our sample, with Latin American countries and the rich settler colonies temporarily approaching European levels in the middle of our period, but then decreasing again. This pattern is reflected in the fact that outside Europe relatively

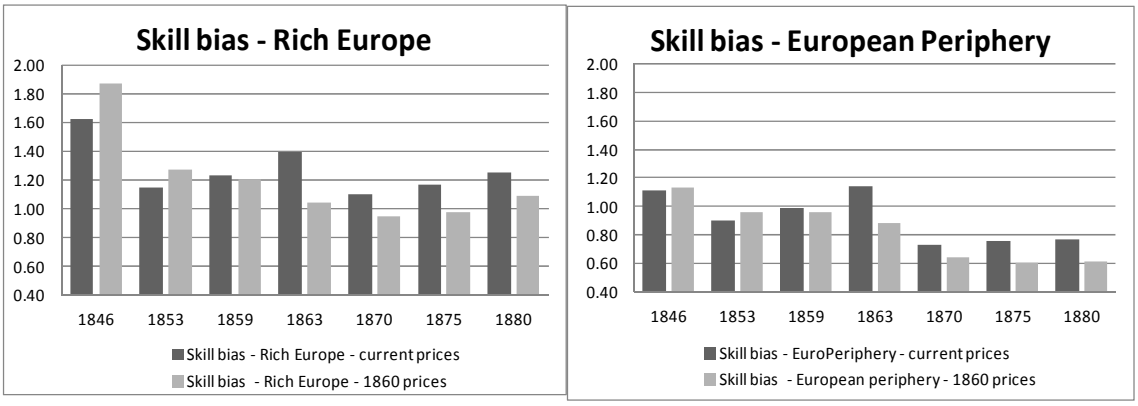
[66] This can be seen from a comparison of the British-export weighted rates in online appendix A.3 with the unweighted averages in online appendix A.2: The weighted rates are higher for almost all independent countries.

[67] Nunn and Trefler, "Structure."

uniform *ad valorem* rates across commodity groups were much more common than in Europe, where detailed schemes of specific duties prevailed. The second step is to look at the level and evolution of the 'skill bias' over time. For the present purpose we have measured skill bias as the ratio of the average of 'high-skill industries' to 'low-skill industries', following Tena.[68] A value above 1 for this indicator means that that high-skill industries were more protected than low-skill industries, which *ceteris paribus* hints at a 'positive skill bias' in the tariff structure. Figure 5 shows that the skill bias in current prices was consistently above 1 over the whole period in the rich European core, while it was mostly below one in thepoorer European periphery, especially after 1863, when a clear bias in favor of low-skill manufactures becomes visible. For the period 1859-70 we observe divergent patterns between skill bias measured in current and constant prices, indicating contrary movements in relative prices and relative nominal protection levels. From 1859 to 1863, in current prices, tariffs for low-skill sectors fell faster than those for high-skill sectors both in the core and in the periphery, even though pure commercial policy did actually lower duties in constant prices faster for high- than for low-skilled sectors. Between 1863 and 1870 we see that in both 'clubs' commercial policy became more inclined towards low-skill sectors, a process that was reversed to a certain degree in the Rich European countries after 1870, presumably by slightly increasing tariffs for high-skill industries. In sum, Cobden-Chevalier, despite lowering overall tariff levels, did little to change the tariff structure in favor of skill-intensive manufactures.

[68] Tena, "Bairoch Revisited,"defines paper, silk manufactures (incl, thread), iron and steel and leather as industries with high skill intensity, while the corresponding low-skill sectors are woolen, linen and cotton yarns and the manufactures (cloth) made thereof.

Figure 5: Tariff skill bias



Note: Skill bias calculated as ratio of tariff average for manufactures with high skill intensity to tariff average for manufactures with low skill intensity (see text).

For the other clubs, the evidence is mixed and inconclusive. After the Civil War in the U.S. the tariff structure also became more inclined towards low-skill industries: the average pre-war ratio was 1.05 and it fell to an average of 0.84 after 1863. Latin American countries showed a pattern that consistently favored low-skill over high-skill sectors (they average 0.86). The Rich semi-independent group (Australia, Canada and New Zealand) consistently increased their inclination towards more skill-intensive activities (from 0.77 in 1853 to 1.22 in 1875). The group of the dependent poor shows the opposite trend (moving from 1.3 before 1860 to 0.97 after 1870). This result, however, is driven mainly by India and Morocco; most countries had ratios close to one over the whole period thanks to their 'flat rate' *ad valorem* tariffs.

However, the whole complex of skill-bias requires much more detailed investigation, since countries at different levels of development might rationally choose a tariff structure that first favors labor-intensive, low-skill manufacturing over agriculture (and impose fiscal tariffs on higher-skill products), medium-skill capital intensive manufactures over low-skill sectors or strategic and skill-intensive sectors not

covered here (for example, machinery, arms, locomotives or boats) over industries producing the commodities we define as skill intensive.

CONCLUSION

This article offers a new wider perspective on the evolution of worldwide tariff levels on manufactures from 1846 to 1880. Previous attempts to measure tariff rates and their changes had been limited to some European countries, to protection on agriculture or based on the 'average tariff' measure which is strongly biased, especially in Europe, by changes in fiscal tariffs on product of tropical agriculture, alcoholic beverages and the like. Although the data and analysis presented in the present article will be extended in the future to allow for solid econometric analysis into causal relations between liberalization (especially of manufactured goods) and trade expansion in different regions of the world as well as explanatory models of the 'demand side' of liberalization, that is the political economy of tariffs, we wish to highlight a number of important findings:

Our results show that world trade was increasingly liberalized since at least 1846. This makes our view on liberalization is therefore more optimistic than the conventional wisdom offered by Bairoch, Irwin and others who are skeptical about significant liberalization outside Britain before the wave of bilateral treaties of the 1860s. We find that most independent countries in the world liberalized during the late 1840s and the 1850s, and that liberalization on a world level continued until at least 1870. In the second phase of world tariff liberalization after 1860, liberalization via Cobden-Chevalier bilateralism was important for the reduction of manufactures tariffs in the world, not least because the share of the 'member' countries of the network in

world trade (not including the UK) was about 60% (in 1879). Furthermore, tariff rates remained low in most of the colonies and territories under European influence. In contrast, those independent countries not taking part in this wave of treaties on average increased their levels of protection. However, since their share in world trade was rather small (about 26%, most of it by the U.S. and Russia), their impact on a world scale was relatively small. The observed correlation in the 1860s between absence of bilateral co-operation to liberalize trade and increasing average tariff rates for manufactures constitutes negative evidence that there were no two effective paths to liberalization after 1860s, while the positive evidence of the European core of the Atlantic economy shows that Cobden-Chevalier was an effective instrument to the sustain the liberalization dynamic underway before 1860.[69]

To conclude, we wish to highlight the general trend of liberalization over the whole period, at least until 1870. The world average tariff in 1880 was little more than half the 1846 level, no matter if we use trade or population as weights. Of the 35 countries covered for the whole period (taking Italy as a continuation of Sardinia), 23 had lower tariffs on manufactures in 1880 than in 1846. Of the remaining dozen, only the U.S., Brazil, Colombia, Cuba and Greece had averaged levels above the population weighted world average of 17% in 1880. Therefore, we conclude that British liberalization after 1846 was typical rather than exceptional of a general trend of dismantling Old Regime mercantilism and decreasing political barriers of trade in the middle decades of the nineteenth century.

[69] Why it failed to spread beyond Europe and did not allow for sustained liberalization after 1870 or 1875 is discussed in detail in Lampe, "Explaining Nineteenth-Century Bilateralism."

These results reveal something relevant for our knowledge of the dynamics of commercial liberalization in the nineteenth century which followed a general trend and was not sparked by any kind of bilateral or multilateral approach. Rules of all kinds of countries seem to have decided that it would be favorable to decrease trade barriers for manufactured goods. We believe that given our evidence the idea that liberalization first took part in Britain, for endogenous political economy reasons or the increasing political weight of Enlightenment ideas,[70] and then spread from overseas, via commercial hegemony, the spread of free trade ideology[71] or gunboat diplomacy, should be revisited. If unilateral liberalization was underway at least since 1846, although reinforced by bilateralism during the 1860s, Britain might not have been alone in unilaterally questioning the costs of trade barriers, as it was not alone in dismantling them.

[70] See Schonhardt-Bailey, *From the Corn Laws*, for the former, and Morrison, "Before Hegemony," for an argument from Adam Smith to the evolving political free trade ideology.

[71] Kindleberger, "Rise of Free Trade."

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Table A.1 – Price Data (1846-1880)

ARTICLES	Unit	1846	1847	1848	1849	1850	1851	1852	1853	1854	1855	1856	1857	1858	1859	1860	1861	1862	1863	1864	1865	1866	1867	1868	1869	1870	1871	1872	1873	1874	1875	1876	1877	1878	1879	1880
	Measure	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
PAPER	Cwts	3,62	3,86	3,17	3,01	3,13	3,05	3,17	3,86	4,15	3,45	3,38	3,62	3,32	3,33	3,35	3,31	3,22	3,24	3,24	3,18	2,95	2,89	2,96	2,83	2,88	2,79	2,91	3,01	2,93	2,91	2,88	2,78	2,69	2,56	2,54
Paper Manufactures (Hangings)	Cwts	4,63	4,94	4,06	3,85	4,00	3,90	4,06	4,94	5,30	3,30	3,08	3,53	3,61	3,40	3,41	3,41	3,25	3,26	3,29	3,32	2,71	2,83	2,88	2,85	2,86	2,68	2,82	2,91	2,83	2,97	2,95	2,83	2,93	2,87	2,78
paper for writing	Cwts	3,89	4,15	3,41	3,24	3,37	3,28	3,41	4,15	4,46	4,42	4,42	4,59	3,98	4,11	4,05	3,96	3,77	3,77	3,66	3,58	3,46	3,20	3,40	3,09	3,28	3,06	3,06	3,20	3,28	3,23	3,21	3,04	2,86	2,62	2,55
paper of other sorts (not hangings)		2,33	2,49	2,04	1,94	2,02	1,97	2,04	2,49	2,67	2,65	2,65	2,75	2,38	2,46	2,59	2,57	2,65	2,70	2,75	2,65	2,67	2,62	2,59	2,57	2,52	2,62	2,86	2,91	2,67	2,52	2,49	2,46	2,28	2,18	2,31
SILK	lbs	0,99	1,00	1,04	1,02	0,96	1,01	1,02	1,07	1,03	1,02	1,13	1,27	1,13	1,18	1,23	1,53	1,57	1,60	1,63	1,57	1,59	1,56	1,54	1,53	1,49	1,56	1,70	1,73	1,59	1,49	1,48	1,46	1,35	1,29	1,37
Silk throwns	lbs	0,80	0,78	0,67	0,76	0,76	0,79	0,85	0,88	0,90	0,88	1,08	1,26	1,02	1,11	1,21	1,10	1,13	1,16	1,18	1,13	1,14	1,12	1,11	1,10	1,08	1,12	1,22	1,25	1,14	1,08	1,07	1,05	0,98	0,93	0,99
Silk Manufactures (Broad Piece Goods)	lbs	1,18	1,23	1,41	1,28	1,16	1,23	1,20	1,25	1,16	1,16	1,18	1,29	1,23	1,24	1,24	1,95	2,01	2,05	2,09	2,01	2,03	1,99	1,97	1,95	1,91	1,99	2,17	2,21	2,03	1,91	1,89	1,87	1,73	1,65	1,75
Silk Manufactures (Broad stuffs)																																				
IRON AND STEEL MANUFACTURES	tons	11,09	10,77	7,98	8,01	7,82	7,49	8,12	11,14	12,87	11,96	12,94	12,67	10,60	10,91	11,00	10,01	10,27	10,67	10,52	9,63	9,85	9,32	9,50	10,71	10,88	11,59	16,26	17,39	13,36	10,64	9,41	8,67	7,78	8,03	9,48
Pig	tons	4,07	3,86	2,76	2,58	2,45	1,73	2,32	3,17	4,24	3,68	3,88	3,81	2,99	2,85	3,12	2,68	2,71	2,76	3,03	2,92	3,08	2,86	2,86	2,89	2,96	3,11	5,04	6,23	4,73	3,64	3,12	2,87	2,68	2,58	3,20
Steel bars, angles,shapes(l/Ton)	tons	10,03	9,72	7,72	6,47	5,97	5,79	6,00	8,61	9,29	8,57	9,41	9,19	8,10	7,66	7,66	7,29	7,17	7,77	9,18	8,63	8,64	7,78	7,55	7,44	8,14	8,28	11,64	13,10	11,80	9,87	8,77	7,77	7,17	6,64	7,81
Rails	tons	8,71	8,53	5,30	5,92	5,74	5,21	5,83	8,08	10,32	9,24	9,42	8,98	7,09	6,73	7,00	6,37	7,00	7,27	7,45	7,09	7,90	7,00	6,91	7,00	7,09	7,63	13,28	15,26	11,40	8,53	7,63	7,09	6,28	6,19	7,09
Galvanised corrugated sheets	tons	15,76	15,44	9,59	10,73	10,40	9,43	10,56	14,63	18,69	16,74	17,06	16,25	12,84	12,19	12,68	11,54	12,68	13,16	13,49	12,84	14,30	12,68	12,51	12,68	12,84	13,81	24,05	27,63	20,64	15,44	13,81	12,84	11,38	11,21	12,84
Tinplates	tons	16,88	16,29	14,52	14,33	14,52	15,31	15,90	21,20	21,79	21,59	24,93	25,12	21,98	25,12	24,53	22,18	21,79	22,37	19,43	16,68	15,31	16,29	17,66	23,55	23,36	25,12	27,28	24,73	18,25	15,70	13,74	12,76	11,38	13,54	16,49
LEATHER AND MANUFACTURES THEROF	Cwts	6,79	7,25	5,95	5,65	5,88	5,72	5,95	7,25	7,78	8,27	8,82	9,62	8,62	8,30	8,78	8,99	9,42	9,40	10,00	9,57	11,27	9,55	9,01	8,33	8,19	8,13	8,78	9,01	8,90	8,90	8,08	8,07	7,31	6,86	7,85
Calf Skins	Cwts	6,79	7,25	5,95	5,65	5,88	5,72	5,95	7,25	7,78	8,27	8,82	9,62	8,62	8,30	8,78	8,99	9,42	9,40	10,00	9,57	11,27	9,55	9,01	8,33	8,19	8,13	8,78	9,01	8,90	8,90	8,08	8,07	7,31	6,86	7,85
Boots and shoes of leather	Doz. Pairs	3,22	3,44	2,82	2,68	2,79	2,71	2,82	3,44	3,69	3,66	3,66	3,80	3,29	3,40	3,58	3,55	3,66	3,79	3,67	3,38	3,38	3,48	3,18	3,04	3,08	2,99	2,93	3,24	3,35	3,28	3,17	3,06	3,06	3,03	3,05
COPPER LINGOTS, CAKES , SALABS	Cwts	4,14	4,44	3,88	3,84	3,88	3,88	4,44	5,26	5,71	5,69	5,52	5,96	5,21	5,45	5,37	4,96	4,89	4,65	4,88	4,45	4,51	4,06	4,07	4,00	3,73	3,78	4,81	4,68	4,40	4,40	4,13	3,78	3,49	3,17	3,41
Copper lingots, cakes, slabs	Cwts	4,14	4,44	3,88	3,84	3,88	3,88	4,44	5,26	5,71	5,69	5,52	5,96	5,21	5,45	5,37	4,96	4,89	4,65	4,88	4,45	4,51	4,06	4,07	4,00	3,73	3,78	4,81	4,68	4,40	4,40	4,13	3,78	3,49	3,17	3,41
WOLLEN WORSTED MANUFACTURES	lbs	0,29	0,28	0,27	0,24	0,21	0,21	0,21	0,23	0,23	0,23	0,23	0,23	0,24	0,26	0,27	0,27	0,31	0,33	0,35	0,37	0,37	0,38	0,35	0,35	0,33	0,36	0,40	0,39	0,37	0,39	0,38	0,37	0,35	0,35	0,36
Wollen pice light all wool	lbs	0,49	0,50	0,48	0,41	0,36	0,38	0,37	0,40	0,37	0,40	0,37	0,37	0,40	0,44	0,46	0,46	0,55	0,59	0,65	0,68	0,70	0,72	0,65	0,67	0,61	0,71	0,80	0,76	0,74	0,79	0,78	0,74	0,70	0,71	0,73
Worsted stuffs all wool	lbs	0,16	0,17	0,16	0,15	0,13	0,14	0,13	0,14	0,13	0,13	0,13	0,13	0,15	0,16	0,16	0,16	0,18	0,19	0,21	0,24	0,22	0,22	0,21	0,21	0,21	0,22	0,22	0,22	0,21	0,21	0,20	0,20	0,20	0,18	0,19
Wollen clothing - flanel	lbs	0,21	0,19	0,18	0,15	0,14	0,13	0,12	0,15	0,17	0,17	0,17	0,19	0,18	0,19	0,19	0,19	0,19	0,21	0,20	0,20	0,21	0,20	0,18	0,17	0,16	0,16	0,17	0,18	0,17	0,17	0,17	0,16	0,16	0,15	0,15
LINEN MANUFACTURES	lbs	0,088	0,086	0,087	0,068	0,074	0,076	0,082	0,091	0,094	0,090	0,085	0,087	0,087	0,087	0,086	0,085	0,081	0,096	0,100	0,096	0,098	0,093	0,089	0,084	0,085	0,088	0,088	0,091	0,093	0,090	0,085	0,086	0,086	0,084	0,088
Linen pice goods	lbs	0,088	0,086	0,087	0,068	0,074	0,076	0,082	0,091	0,094	0,090	0,085	0,087	0,087	0,087	0,086	0,085	0,081	0,096	0,100	0,096	0,098	0,093	0,089	0,084	0,085	0,088	0,088	0,091	0,093	0,090	0,085	0,086	0,086	0,084	0,088
COTTON MANUFACTURES	lbs	0,083	0,087	0,073	0,072	0,076	0,070	0,074	0,076	0,073	0,074	0,072	0,075	0,073	0,076	0,076	0,074	0,086	0,111	0,126	0,113	0,116	0,100	0,088	0,091	0,086	0,084	0,087	0,086	0,082	0,082	0,077	0,072	0,072	0,068	0,068
Cotton piece bleached	lbs	0,067	0,074	0,060	0,059	0,063	0,060	0,060	0,064	0,059	0,058	0,060	0,062	0,060	0,064	0,064	0,063	0,076	0,104	0,121	0,105	0,106	0,091	0,075	0,079	0,074	0,070	0,073	0,072	0,067	0,065	0,061	0,059	0,056	0,055	0,056
Cotton piece printed	lbs	0,099	0,100	0,086	0,085	0,089	0,080	0,087	0,089	0,086	0,089	0,084	0,087	0,085	0,088	0,088	0,086	0,095	0,118	0,132	0,121	0,126	0,110	0,101	0,102	0,099	0,098	0,100	0,100	0,098	0,099	0,093	0,085	0,087	0,082	0,079
WOLLEN AND WORSTED YARNS	lbs	0,104	0,099	0,092	0,093	0,105	0,101	0,101	0,104	0,099	0,095	0,103	0,115	0,119	0,130	0,135	0,126	0,137	0,155	0,168	0,168	0,160	0,160	0,150	0,149	0,139	0,140	0,155	0,171	0,175	0,161	0,143	0,134	0,125	0,110	0,126
Wollen carded	lbs																																			
Worsted yarn	lbs	0,104	0,099	0,092	0,093	0,105	0,101	0,101	0,104	0,099	0,095	0,103	0,115	0,119	0,130	0,135	0,126	0,137	0,155	0,168	0,168	0,160	0,160	0,150	0,149	0,139	0,140	0,155	0,171	0,175	0,161	0,143	0,134	0,125	0,110	0,126
LINEN YARN (Lbs)	lbs	0,045	0,051	0,042	0,042	0,048	0,051	0,048	0,050	0,052	0,051	0,054	0,056	0,055	0,061	0,058	0,059	0,057	0,066	0,074	0,069	0,071	0,078	0,077	0,074	0,060	0,061	0,068	0,069	0,063	0,067	0,065	0,067	0,066	0,062	0,059
Linen yarns unbleached	lbs	0,045	0,051	0,042	0,042	0,048	0,051	0,048	0,050	0,052	0,051	0,054	0,056	0,055	0,061	0,058	0,059	0,057	0,066	0,074	0,069	0,071	0,078	0,077	0,074	0,060	0,061	0,068	0,069	0,063	0,067	0,065	0,067	0,066	0,062	0,059
COTTON YARNS	lbs	0,048	0,050	0,044	0,048	0,049	0,046	0,046	0,047	0,045	0,044	0,044	0,049	0,048	0,049	0,050	0,052	0,067	0,108	0,120	0,100	0,099	0,088	0,084	0,083	0,079	0,078	0,079	0,074	0,066	0,061	0,055	0,054	0,052	0,051	0,055
Cotton thread for sewing	lbs	0,048	0,050	0,044	0,048	0,049	0,046	0,046	0,047	0,045	0,044	0,044	0,049	0,048	0,049	0,050	0,052	0,067	0,108	0,120	0,100	0,099	0,088	0,084	0,083	0,079	0,078	0,079	0,074	0,066	0,061	0,055	0,054	0,052	0,051	0,055

Table A.2 – Tariffs on Manufacturing Products Around the Globe, Unweighted Averages (1846-1880)

		1846	1853	1859	1863	1870	1875	1880
1	Belgium	19.8%	30.8%	24.9%	10.3%	8.6%	8.7%	9.8%
1	Denmark	23.1%	15.8%	14.2%	11.5%	11.1%	11.7%	13.0%
1	France	89.9%	86.5%	70.6%	17.0%	21.1%	22.3%	24.5%
1	Netherlands	5.2%	4.3%	4.0%	3.6%	3.4%	3.4%	2.6%
1	Switzerland	0.4%	2.9%	2.9%	2.8%	2.6%	2.8%	3.2%
1	Zollverein (Germany)	20.6%	23.4%	23.4%	18.4%	9.0%	8.8%	12.8%
2	USA	23.3%	23.3%	17.9%	29.1%	51.3%	49.1%	53.2%
3	Austria-Hungary	58.9%	27.9%	29.3%	26.2%	12.1%	12.3%	15.9%
3	Greece	9.9%	9.8%	19.5%	22.0%	22.5%	22.3%	34.7%
3	Italia				9.4%	8.7%	8.6%	13.3%
3	Norway	23.4%	22.7%	16.9%	12.1%	7.6%	6.0%	6.8%
3	Portugal	73.9%	66.2%	60.1%	45.8%	51.3%	51.2%	47.0%
3	Roman (Papal) States	38.8%	34.9%	23.2%	19.2%	13.8%		
3	Romania	3.0%	5.0%	5.0%	5.0%	5.5%	5.5%	12.9%
3	Russia	165.8%	104.7%	48.8%	54.4%	48.9%	50.6%	62.4%
3	Sardinia	42.2%	17.3%	12.6%				
3	Spain	83.1%	65.6%	60.2%	50.6%	37.2%	38.1%	42.5%
3	Sweden	56.4%	45.0%	18.9%	16.3%	10.3%	10.6%	11.8%
4	Argentina		13.1%	9.3%	11.6%	18.7%	19.4%	23.7%
4	Brazil	26.5%	26.5%	26.0%	26.7%	26.3%	32.0%	35.0%
4	Chile	34.5%	23.3%	21.9%	21.1%	22.3%	23.2%	26.1%
4	Colombia (New Granada)	42.8%	44.8%	33.2%	33.0%	49.8%	39.7%	58.1%
4	Mexico	144.5%	113.9%	92.7%	75.3%	77.9%	99.0%	111.2%
4	Peru	23.3%	23.1%	19.3%	17.7%	17.7%	17.0%	17.4%
4	Uruguay	27.0%	26.2%	17.3%	10.0%	11.9%	17.3%	15.9%
4	Venezuela	54.7%	70.2%	51.1%	51.2%	29.8%	36.0%	41.1%
5	Australia (Victoria)	0.0%	0.0%	0.0%	1.3%	5.7%	5.7%	7.4%
5	Canada	4.9%	11.7%	15.0%	15.3%	13.0%	12.2%	16.6%
5	New Zealand	0.0%	10.0%	1.9%	1.5%	4.6%	9.0%	12.5%
6	China	5.4%	5.2%	5.1%	4.9%	5.9%	5.7%	6.4%
6	Cuba	26.4%	28.4%	25.8%	28.0%	50.1%	61.4%	70.3%
6	Hong Kong	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
6	India	2.6%	4.0%	7.7%	4.4%	5.9%	5.8%	4.7%
6	Jamaica		4.0%	12.2%	12.2%	12.1%	12.1%	12.1%
6	Japan			17.3%	17.3%	5.0%	5.0%	5.0%
6	Java (Dutch East Indies)	21.2%		12.0%	12.0%	11.0%	5.4%	5.4%
6	Morocco	13.3%	15.9%	18.2%	10.0%	10.0%	10.0%	10.0%
6	South Africa	5.0%	5.0%	7.5%	7.5%	10.0%	10.0%	10.0%
6	Tunez			8.0%	8.0%	8.0%	8.0%	8.0%
6	Turkey (incl. Egypt)	3.1%	2.9%	2.8%	7.4%	7.7%	7.7%	8.1%
6	Zanzibar	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%

Note: Sorted by "Country Clubs" (column 1, see Table 2)

Table A.3 – Tariffs on manufacturing products around the world, trade weighted averages (1846-1880)

		1846	1853	1859	1863	1870	1875	1880
1	Belgium	22.6%	51.3%	44.7%	16.0%	18.1%	20.1%	26.1%
1	Denmark	33.6%	22.2%	20.2%	12.9%	14.3%	15.5%	19.2%
1	France	107.5%	82.6%	69.1%	22.6%	24.2%	24.0%	23.5%
1	Netherlands	4.6%	4.4%	3.7%	4.0%	3.8%	4.0%	3.6%
1	Switzerland	0.4%	3.1%	3.0%	4.0%	2.9%	2.8%	3.4%
1	Zollverein (Germany)	45.5%	49.9%	52.1%	30.2%	14.5%	14.1%	22.6%
2	USA	24.6%	24.7%	20.4%	34.0%	63.2%	63.5%	75.4%
3	Austria-Hungary	129.6%	48.9%	52.4%	33.1%	17.9%	17.2%	28.1%
3	Greece	9.9%	9.9%	15.5%	21.9%	19.9%	20.3%	44.8%
3	Italia				11.3%	11.4%	11.6%	18.0%
3	Norway	39.5%	38.9%	25.9%	9.7%	9.6%	8.7%	11.0%
3	Portugal	53.4%	56.3%	54.5%	40.6%	47.2%	49.2%	56.9%
3	Roman (Papal) States	39.5%	35.6%	26.5%	20.6%	14.3%		
3	Romania	3.0%	5.0%	5.0%	5.0%	5.5%	5.5%	12.2%
3	Russia	217.2%	152.5%	81.9%	65.8%	72.7%	80.6%	106.9%
3	Sardinia	54.2%	24.1%	20.3%				
3	Spain	136.2%	83.6%	81.8%	68.0%	50.3%	50.7%	59.9%
3	Sweden	68.0%	61.6%	30.3%	16.5%	15.8%	17.8%	22.9%
4	Argentina		12.7%	11.0%	12.4%	18.1%	18.0%	21.6%
4	Brazil	26.5%	26.8%	22.2%	24.5%	24.7%	31.5%	39.4%
4	Chile	34.1%	23.0%	22.9%	21.4%	23.5%	23.8%	25.8%
4	Colombia (New Granada)	65.6%	52.6%	43.0%	41.0%	50.3%	45.2%	74.1%
4	Mexico	157.3%	125.5%	98.4%	78.2%	79.8%	110.1%	130.9%
4	Peru	23.5%	23.0%	18.3%	17.3%	17.6%	18.2%	18.6%
4	Uruguay	30.4%	29.0%	16.1%	10.9%	12.6%	18.6%	17.1%
4	Venezuela	65.9%	87.0%	63.1%	43.8%	24.9%	40.7%	47.7%
5	Australia (Victoria)	0.0%	0.0%	0.0%	1.6%	6.6%	6.8%	9.6%
5	Canada	4.9%	11.2%	16.3%	15.5%	13.7%	12.1%	17.1%
5	New Zealand	0.0%	15.5%	3.2%	1.9%	5.2%	10.0%	14.4%
6	China	5.4%	5.6%	5.6%	5.8%	6.3%	5.9%	6.9%
6	Cuba	25.1%	30.5%	25.8%	28.0%	49.3%	58.7%	67.5%
6	Hong Kong	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
6	India	1.7%	3.0%	5.3%	3.8%	5.0%	4.9%	4.5%
6	Jamaica		4.0%	12.0%	11.9%	11.8%	11.9%	11.9%
6	Japan			11.1%	12.8%	5.0%	5.0%	5.0%
6	Java (Dutch East Indies)	23.3%		12.0%	12.0%	12.2%	6.0%	6.0%
6	Morocco	13.9%	20.3%	24.0%	10.0%	10.0%	10.0%	10.0%
6	South Africa	5.0%	5.0%	7.5%	7.5%	10.0%	10.0%	10.0%
6	Tunez			8.0%	8.0%	8.0%	8.0%	8.0%
6	Turkey (incl. Egypt)	3.0%	2.5%	2.5%	7.5%	7.7%	7.6%	7.8%
6	Zanzibar	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%

Note: Sorted by "Country Clubs" (column 1, see Table 2), weights are British export shares in each year.

Table A.4 – Tariffs on manufacturing products around the world, unweighted variances (1846-1880)

		1846	1853	1859	1863	1870	1875	1880
1	Belgium	0.0228	0.0649	0.0552	0.0062	0.0115	0.0125	0.0192
1	Denmark	0.0124	0.0061	0.0057	0.0057	0.0054	0.0053	0.0070
1	France	0.7557	0.8217	0.7223	0.0197	0.0467	0.0717	0.0868
1	Netherlands	0.0010	0.0007	0.0007	0.0004	0.0006	0.0006	0.0006
1	Switzerland	0.0000	0.0006	0.0008	0.0019	0.0008	0.0008	0.0009
1	Zollverein (Germany)	0.0592	0.0667	0.0689	0.0365	0.0067	0.0055	0.0106
2	USA	0.0019	0.0019	0.0018	0.0109	0.0411	0.0427	0.0686
3	Austria-Hungary	0.7102	0.0694	0.0756	0.0546	0.0158	0.0151	0.0287
3	Greece	0.0000	0.0000	0.0097	0.0261	0.0373	0.0308	0.0729
3	Italia				0.0034	0.0021	0.0022	0.0074
3	Norway	0.0291	0.0384	0.0155	0.0057	0.0034	0.0025	0.0034
3	Portugal	0.6383	0.5360	0.3650	0.2578	0.3425	0.2810	0.1441
3	Roman (Papal) States	0.0663	0.0472	0.0261	0.0227	0.0063		
3	Romania	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0040
3	Russia	1.3933	0.7297	0.1382	0.3034	0.2316	0.2436	0.3458
3	Sardinia	0.1280	0.0105	0.0070				
3	Spain	0.4987	0.1708	0.1685	0.1317	0.0349	0.0425	0.0488
3	Sweden	0.1741	0.1393	0.0291	0.0175	0.0093	0.0098	0.0146
4	Argentina		0.0017	0.0023	0.0023	0.0016	0.0008	0.0020
4	Brazil	0.0020	0.0020	0.0260	0.0067	0.0064	0.0085	0.0150
4	Chile	0.0711	0.0020	0.0023	0.0031	0.0016	0.0010	0.0030
4	Colombia (New Granada)	0.0846	0.0632	0.0443	0.1540	0.2218	0.1144	0.3763
4	Mexico	0.5144	0.5884	0.2383	0.1007	0.1117	0.1752	0.2252
4	Peru	0.0049	0.0110	0.0025	0.0052	0.0052	0.0055	0.0046
4	Uruguay	0.0161	0.0154	0.0143	0.0032	0.0015	0.0040	0.0015
4	Venezuela	0.1226	0.1985	0.1463	0.1130	0.0498	0.0439	0.0601
5	Australia (Victoria)	0.0000	0.0000	0.0000	0.0007	0.0018	0.0018	0.0030
5	Canada	0.0000	0.0006	0.0048	0.0050	0.0021	0.0026	0.0017
5	New Zealand	0.0000	0.0036	0.0008	0.0006	0.0010	0.0010	0.0024
6	China	0.0002	0.0003	0.0003	0.0010	0.0011	0.0009	0.0010
6	Cuba	0.0118	0.0112	0.0000	0.0000	0.0213	0.0475	0.0571
6	Hong Kong	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	India	0.0002	0.0004	0.0017	0.0015	0.0002	0.0002	0.0001
6	Jamaica		0.0000	0.0001	0.0001	0.0002	0.0002	0.0002
6	Japan			0.0037	0.0037	0.0000	0.0000	0.0000
6	Java (Dutch East Indies)	0.0033		0.0000	0.0000	0.0042	0.0004	0.0004
6	Morocco	0.0118	0.0380	0.0734	0.0000	0.0000	0.0000	0.0000
6	South Africa	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	Tunez			0.0000	0.0000	0.0000	0.0000	0.0000
6	Turkey (incl. Egypt)	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0003
6	Zanzibar	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note: Sorted by "Country Clubs" (column 1, see Table 2)

Table A.5 – Tariffs on Manufacturing Products Around the Globe, Trade Weighted Variances (1846-1880)

		1846	1853	1859	1863	1870	1875	1880
1	Belgium	0.0278	0.0840	0.0956	0.0079	0.0298	0.0355	0.0628
1	Denmark	0.0216	0.0084	0.0132	0.0072	0.0085	0.0099	0.0170
1	France	1.1063	1.0638	0.8771	0.0214	0.0495	0.0776	0.0835
1	Netherlands	0.0008	0.0006	0.0003	0.0004	0.0006	0.0005	0.0006
1	Switzerland	0.0001	0.0004	0.0005	0.0035	0.0007	0.0006	0.0007
1	Zollverein (Germany)	0.1451	0.1395	0.1550	0.0625	0.0083	0.0078	0.0215
2	USA	0.0009	0.0008	0.0011	0.0144	0.0455	0.0587	0.1065
3	Austria-Hungary	1.6212	0.1492	0.1455	0.0668	0.0190	0.0205	0.0660
3	Greece	0.0000	0.0000	0.0047	0.0255	0.0282	0.0250	0.1447
3	Italia				0.0056	0.0031	0.0047	0.0079
3	Norway	0.0861	0.1134	0.0257	0.0025	0.0064	0.0056	0.0094
3	Portugal	0.2085	0.1206	0.1075	0.1382	0.1690	0.1532	0.1948
3	Roman (Papal) States	0.0360	0.0270	0.0269	0.0317	0.0039		
3	Romania	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0032
3	Russia	1.3848	0.6648	0.3292	0.3287	0.3944	0.4861	0.7942
3	Sardinia	0.1444	0.0139	0.0056				
3	Spain	0.8804	0.2333	0.2252	0.1847	0.0361	0.0532	0.0769
3	Sweden	0.2230	0.2328	0.0745	0.0224	0.0237	0.0280	0.0482
4	Argentina		0.0020	0.0029	0.0030	0.0015	0.0013	0.0029
4	Brazil	0.0021	0.0017	0.0169	0.0104	0.0105	0.0149	0.0406
4	Chile	0.0350	0.0028	0.0028	0.0049	0.0010	0.0008	0.0025
4	Colombia (New Granada)	0.1491	0.0667	0.0604	0.2711	0.1403	0.1604	0.5509
4	Cuba	0.0114	0.0189	0.0000	0.0000	0.0127	0.0317	0.0390
4	Mexico	0.3331	0.3915	0.3054	0.0880	0.0830	0.0939	0.1667
4	Peru	0.0028	0.0112	0.0024	0.0042	0.0037	0.0033	0.0028
4	Uruguay	0.0130	0.0162	0.0096	0.0044	0.0019	0.0043	0.0018
4	Venezuela	0.0756	0.1679	0.2066	0.0596	0.0247	0.0604	0.0897
5	Australia (Victoria)	0.0000	0.0000	0.0000	0.0012	0.0018	0.0017	0.0034
5	Canada	0.0000	0.0012	0.0040	0.0045	0.0011	0.0015	0.0007
5	New Zealand	0.0000	0.0035	0.0010	0.0005	0.0006	0.0004	0.0009
6	China	0.0002	0.0003	0.0004	0.0012	0.0011	0.0008	0.0009
6	Hong Kong	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	India	0.0003	0.0007	0.0030	0.0014	0.0001	0.0002	0.0001
6	Jamaica		0.0000	0.0002	0.0002	0.0003	0.0003	0.0003
6	Japan			0.0071	0.0068	0.0000	0.0000	0.0000
6	Java (Dutch East Indies)	0.0022		0.0000	0.0000	0.0051	0.0002	0.0002
6	Morocco	0.0165	0.0726	0.1395	0.0000	0.0000	0.0000	0.0000
6	South Africa	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	Tunez			0.0000	0.0000	0.0000	0.0000	0.0000
6	Turkey	0.0001	0.0001	0.0002	0.0002	0.0001	0.0001	0.0002
6	Zanzibar	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note: Sorted by "Country Clubs" (column 1, see Table 2)

Table A.6: Adjustments for prohibitions or extremely high duties

A: Prohibitions (substituted with twice the specific or *ad valorem* rate in the first period after repeal). The rate given below is the one included for our calculations in current prices.

Mexico: Leather: 1846: 283%, 1853: 265%; Copper: 1846: 145%, 1853: 145%; Cotton Yarns: 1846: 213%, 1853: 220%

Spain: Leather: 1846: 116%; Cottons: 1846: 200%; Cotton Yarns: 1846: 224%

B. *Ad valorem* equivalents higher than 300% where the 300% cap was applied. The rates given below are the *ad valorem* equivalent in current prices which was substituted by the 300% maximum.

France: Cotton Yarns: 1846: 337%, 1853: 349%, 1859: 331%

Portugal (1846): Linen Yarns 482%

Russia (1846): Iron and Steel 314%, Leather 371%, Linens 1467%, Cottons 486%

Russia (1853): Linens 368%