



## ORIGINAL ARTICLE

# British exports and foreign tariffs: Insights from the Board of Trade's foreign tariff compilation for 1902

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**Abstract**

This research note contributes to the debate over whether British exports were elastic to foreign tariffs before the First World War. In doing so, this study is the first to make econometric use of the commodity- and country-disaggregated foreign tariff data that Britain's Board of Trade compiled for the year 1902. Contrary to previous literature, British exports were indeed elastic to foreign tariffs across a range of manufactured commodities, with a conservative estimate of the elasticity being 3.1, which is not low by modern standards. Counterfactually, if foreign countries had emulated Britain's policy of free trade in manufactures in 1902, a partial-equilibrium estimate is that British exports would have been 57 per cent higher. If the trade-liberalizing trend of the mid-nineteenth century persisted into the late-nineteenth century, then much of the late-Victorian deceleration of British exports would have been avoided.

**KEYWORDS**

Britain, Edwardian era, exports, manufacturing, nineteenth century, protectionism, tariffs, trade

**JEL CLASSIFICATION**

F13, N63, N73

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Britain was the first country to industrialize. Inevitably, therefore, so much of its economic history has been characterized by competition against countries that industrialized later. Britain's exports formed the nexus of this competition, with industrializing countries beginning to produce manufactured goods that Britain had previously exported to those countries.<sup>1</sup> The competition became acute during the decades preceding the First World War. By 1913, the United States and Germany each overtook Britain in industrial output.<sup>2</sup> Yet, it should be observed that industrialization in the late nineteenth century was a widespread phenomenon, hardly limited to the canonical cases of the United States and Germany. Coinciding with the spread of industrialization in the late nineteenth century was a proliferation of protective tariffs, especially in the late 1880s and early 1890s.

The scholarly literature is ambiguous on whether foreign protective tariffs had an effect on British exports during the period from 1870 to 1913 – the late-Victorian and Edwardian eras, in the parlance of British economic history. On this question, there is a general inconsistency between the findings of the microeconomic and macroeconomic literatures covering British trade during this period. A number of microeconomic, industry-specific studies have found that British exports were elastic to foreign tariffs during the late nineteenth century.<sup>3</sup> Inwood and Keay estimated that the elasticity of Britain's exports of pig iron to American and Canadian tariffs was 0.7.<sup>4</sup> Irwin found that the increase in the duty on tinplate under the McKinley Tariff of 1890 initiated American production of tinplate and a displacement of tinplate imports from Britain, which otherwise would not have occurred for another decade.<sup>5</sup> In addition to these econometric studies, there are innumerable industrial histories stressing the effect of foreign tariffs on British exports. For example, Sandberg concluded, 'Throughout the nineteenth century, the performance of British cotton textile exports was heavily dependent on the commercial policies followed by importing countries'.<sup>6</sup>

Yet, the macroeconomic literature has tended to argue against an effect of foreign tariffs on British exports, an argument in discord with theory-informed expectation. In his classic study of late-nineteenth-century British trade, Saul stated that 'it seems unlikely that in the period before 1914 tariffs seriously hindered the development of British trade taken as a whole'.<sup>7</sup> If foreign tariffs did reduce British exports, then it would be expected that such an effect would be most observable in the late 1880s and early 1890s, when many countries passed protective legislation in rapid succession.<sup>8</sup> Still, Hatton discovered that there was no structural break in aggregate British exports

<sup>1</sup> Moreover, these countries were emerging as exporters of manufactured goods, with the consequence that Britain's share of world manufactured exports declined from 41% in 1880 to 30% in 1913; see Saul, 'Export economy', p. 12.

<sup>2</sup> Lewis, *Growth and fluctuations*, p. 274.

<sup>3</sup> There are also numerous industry-specific studies assessing the influence of foreign tariffs on British exports and domestic output prior to 1870. For the cotton industry, see Dunham, 'Cotton industry'; Harley, 'International competitiveness'; Irwin and Temin, 'Antebellum tariff'; and Harley, 'Different products'. For the iron industry, see Dunham, 'Iron industry' and Engerman, 'Iron production'.

<sup>4</sup> Inwood and Keay, 'Transport costs', p. 112.

<sup>5</sup> Irwin, 'Tinplate industry'.

<sup>6</sup> Sandberg, *Lancashire in decline*, p. 172.

<sup>7</sup> Saul, *British overseas trade*, p. 165.

<sup>8</sup> For a detailed account of the rise of protectionism in European countries in the late 1880s and early 1890s, see Bairoch, 'European trade policy', pp. 51–94. Outside of Europe, protectionist legislation was passed in Canada (Tupper Tariff) in 1887, New Zealand in 1888, the United States (McKinley Tariff) in 1890, and New South Wales (Dibbs-See Tariff) and Victoria in 1892.



between 1890 and 1891.<sup>9</sup> Jacks et al. found that, from 1870 to 1913, tariffs were not a statistically significant determinant of (bidirectional) bilateral trade costs for a sample of country pairs in which Britain was a trade partner.<sup>10</sup> However, for Anglo-American trade specifically, which was the largest bilateral trade flow in the world in the late nineteenth century, Varian, using a constructed series of the bilateral American tariff toward Britain, found that tariffs were a determinant of trade costs.<sup>11</sup>

Were foreign tariffs inconsequential for British exports, with the possible exceptions of certain commodities or bilateral trade flows, or did foreign tariffs affect British exports across a range of commodities in a range of national markets? This research note approaches the question using commodity-disaggregated and (within that) country-disaggregated export and tariff data, and it is the first study to do so. Specifically, this study makes use of commodity-level foreign tariff data for the year 1902, which Britain's Board of Trade compiled for the original purpose of estimating, using fixed weights, the average bilateral tariff that British exports encountered in each of 25 export markets. In the analysis that follows, the Board's foreign tariff data serve as an explanatory variable in cross-sectional regressions, which include country and commodity fixed effects controlling for bilateral and commodity-specific resistance, respectively. In contrast with much of the macroeconomic literature, this research note finds that Britain's manufactured exports were indeed elastic to foreign tariffs. Furthermore, the estimated commodity-level elasticity is of a similar magnitude as estimates of modern commodity-level elasticities.

## I | THE BOARD OF TRADE'S FOREIGN TARIFF DATA FOR 1902

The dawn of the twentieth century occurred amid a peak in world protectionism.<sup>12</sup> The protective legislation of the 1880s and 1890s was in effect. Rising world prices, including British export prices, from the late 1890s until the First World War were only just beginning to erode the *ad valorem* equivalent of those tariffs that had been imposed on a specific basis, that is, per unit of imports.<sup>13</sup> It was amid this high-water mark in world protectionism that Britain's Board of Trade endeavoured to estimate the average tariff confronting specifically British exports in different national markets. In a memorandum published in 1903, the Board estimated the average bilateral tariff that British exports encountered in each of 11 countries, using foreign tariff data for the year 1902.<sup>14</sup>

<sup>9</sup> Hatton, 'British exports', p. 585. He acknowledged the indirectness of this approach, observing, 'Because competition took place over such a wide range of markets, it has not been possible to take direct account of protection in the empirical work that follows'; see p. 583.

<sup>10</sup> Jacks et al., 'Trade costs', p. 135. Trade costs are a standardized measure of the difference between actual trade and frictionless trade, that is, counterfactual trade in the absence of any trade barriers.

<sup>11</sup> Varian, 'Bilateral tariff series'.

<sup>12</sup> O'Rourke calculated the unweighted average tariff level across 10 mostly European countries for quinquennial intervals from 1875 to 1914; see O'Rourke, 'Tariffs and growth', p. 461. The average tariff level (13%) was highest for the 1900–4 quinquennium. It should be observed that these average tariff levels include the tariffs on both industrial and agricultural commodities.

<sup>13</sup> Imlah, *Economic elements*, pp. 97–8. The effect of rising prices on the *ad valorem* equivalent tariff has been documented for the American case by Irwin, 'Import prices', p. 1023. Following the Dingley Tariff of 1897, the average *ad valorem* equivalent American tariff was 49.2%. Following the Payne-Aldrich Tariff of 1909, the average *ad valorem* equivalent American tariff was 41.6%. The 7.6 percentage point decrease is decomposable into the legislative effect (1.6 percentage point decrease) and the effect of rising prices (6.0 percentage point decrease).

<sup>14</sup> *British and Foreign Trade* (1903), pp. 465–80.



In a subsequent memorandum published in 1905, the Board estimated the average bilateral tariff that British exports encountered in each of 14 additional countries, again using foreign tariff data for the year 1902 in order to preserve the comparability of all 25 estimated bilateral tariffs.<sup>15</sup>

In this section, a brief overview is given of the Board's procedure for estimating the average bilateral tariff toward British exports in each of the 25 countries. The Board identified 11 manufactured commodity groups and 31 'representative' manufactured commodities. For example, the machinery commodity group consists of three representative commodities: textile machinery, locomotives, and sewing machines. In 1902, the 11 commodity groups collectively accounted for 77 per cent of Britain's manufactured exports by value.<sup>16</sup> For each country, the Board compiled (from foreign statistical publications) the tariffs on each of the 31 representative commodities.<sup>17</sup> An average tariff for each of the 11 commodity groups was calculated as an unweighted average of the tariffs on the representative commodities within the commodity group.

For each country, the average bilateral tariff was then estimated as a weighted average of the 11 commodity-group tariffs. In estimating the average bilateral tariff, the weight applied to each commodity-group tariff was the share of Britain's exports of that commodity group to all countries within an 11-commodity-group basket of Britain's exports to all countries.<sup>18</sup> In other words, the weight attached to the American machinery commodity-group tariff was not the share of British exports of machinery to the United States within an 11-commodity-group basket of British exports to the United States. Rather, it was the share of British exports of machinery to all countries within an 11-commodity-group basket of British exports to all countries. The pitfall in using weights derived from the composition of bilateral exports would be that, if a country imposed a prohibitively high tariff on a commodity group such that British exports of that commodity group to said country were eliminated, then the weight attached to the prohibitively high tariff would be zero. An increase in tariffs would actually produce a decrease in the average bilateral tariff rate. Thus, the Board used weights derived from the composition of its exports to all markets, in an attempt to correct for tariff-induced substitution away from British exports and towards domestic manufactures.

Although the average bilateral tariffs of the 25 countries are not directly used in the econometric analysis that follows, they nevertheless offer a valuable overview of the relative tariff levels in Britain's export markets. Figure 1 presents the Board's average bilateral tariffs, which were markedly higher in the Russian, Iberian, and American markets.

By 1902, Britain's exports were only just starting to receive preferential treatment within the British Empire. Among the five polities of the British Empire included in the Board's compilation, Canada alone operated a policy of imperial preference in 1902, although New Zealand and South Africa adopted policies of imperial preference in 1903.<sup>19</sup> Under the Canadian preferential policy, imports from Britain were subject to duties one-third less than the duties imposed on imports

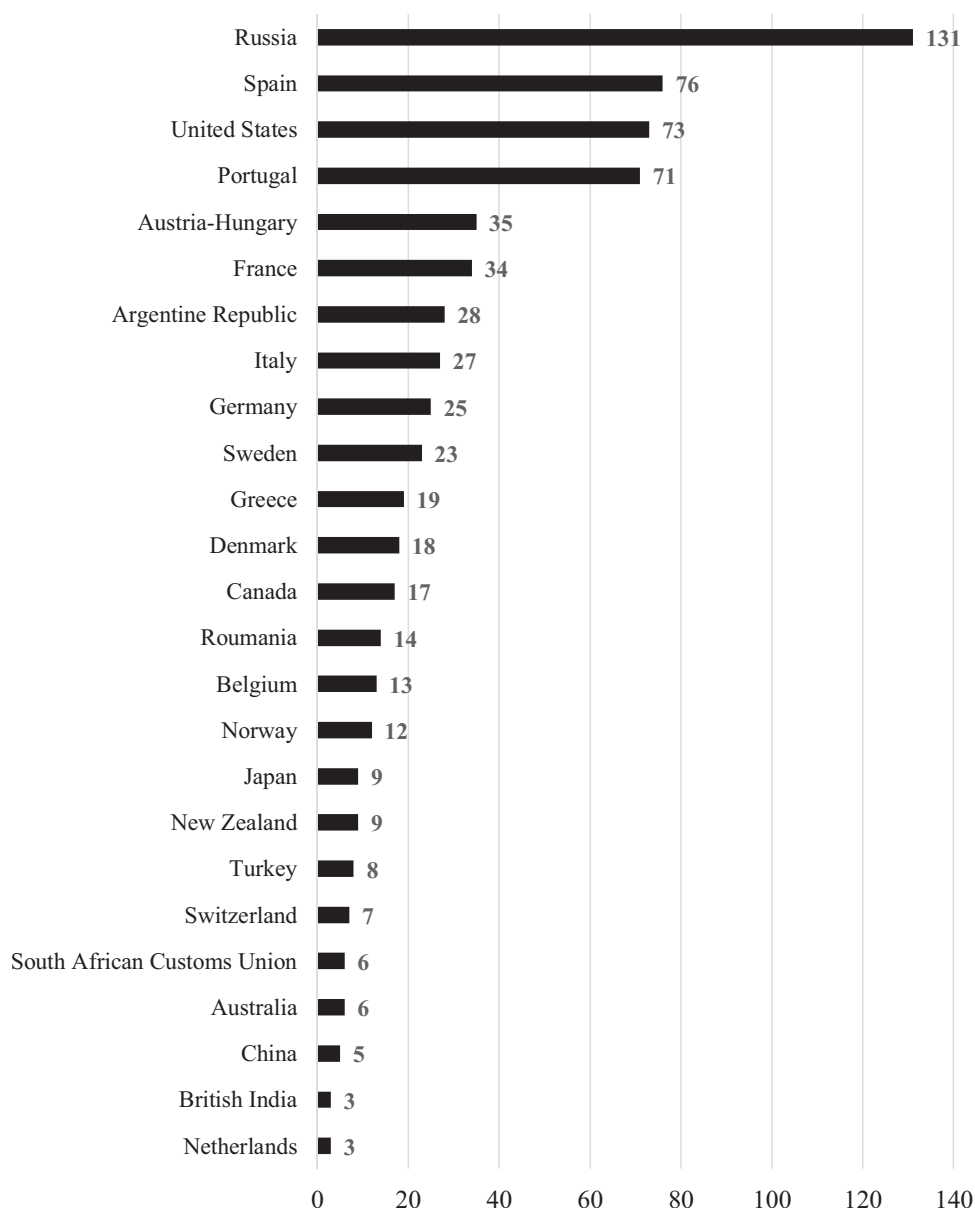
<sup>15</sup> *British and Foreign Trade* (1905), pp. 349–77.

<sup>16</sup> *Ibid.*, p. 353. This 77% includes both the representative and the other commodities within the 11 commodity groups.

<sup>17</sup> If a tariff was imposed on a specific basis, its *ad valorem* equivalent was calculated on the basis of the free on board (FOB) price at the British port; see *ibid.*, pp. 353–4.

<sup>18</sup> The 11 commodity groups and their associated weights are as follows: cotton yarns (4%); cotton manufactures (39%); woollen and worsted yarns (3%); woollen and worsted manufactures (9%); linen manufactures (3%); machinery, hardware, &c. (9%); iron and steel manufactures (16%); ships (3%); apparel (4%); leather and manufactures thereof (2%); and chemicals (5%); see *ibid.*, p. 352.

<sup>19</sup> However, in the sole econometric study of pre-1914 British imperial preference, little evidence was found that New Zealand's preferential policy raised the value of imports from the British Empire; see Varian, 'Imperial preference'.



**FIGURE 1** Board of Trade's estimates of bilateral tariffs toward Britain (per cent), 1902. *Source: British and Foreign Trade* (1905), p. 354

from countries other than Britain.<sup>20</sup> In estimating the bilateral Canadian tariff toward Britain (17 per cent), which fell in the middle of the range of bilateral tariffs, the Board used the preferential tariff rates.<sup>21</sup>

<sup>20</sup> Knowles, *British overseas empire*, p. 382.

<sup>21</sup> *British and Foreign Trade* (1903), p. 476.



For each of the 31 representative commodities, which are organized according to the 11 commodity groups, table 1 reports descriptive statistics for the tariff data collected by the Board. It is stressed that these statistics offer only an approximate indication of the relative degree of protection confronting each of Britain's commodity exports, as the tariffs here are nominal tariffs rather than effective tariffs.<sup>22</sup> Still, one striking feature of the (nominal) tariffs is that they were generally higher for textile than for non-textile commodities. In this respect, the structure of foreign tariffs was adverse to Britain's export sector. Although, it should be observed that, among the textile commodities, tariffs tended to be lower for yarn, an intermediate good, than for cloth, a finished good, implying that foreign countries were pursuing positive effective tariff rates for the weaving stage of textile production. Textiles (including yarn) accounted for the majority, albeit a declining majority, of the manufactured exports of late-Victorian and Edwardian Britain. In 1902–4, textiles were 54 per cent of Britain's manufactured exports, although they had been 61 per cent two decades prior.<sup>23</sup> More importantly, Britain's manufactured exports were more skewed toward textiles than were the manufactured exports of other industrial countries at the close of the nineteenth century.<sup>24</sup>

## II | THE ELASTICITY OF BRITAIN'S MANUFACTURED EXPORTS TO FOREIGN TARIFFS

The Board of Trade compiled tariff data for 31 representative commodities exported to 25 countries, implying a sample of 775 commodity–country observations for the year 1902. However, in the ensuing analysis, the main sample is reduced to 546 commodity–country observations owing to data limitations. For reasons detailed in appendix 1, all observations for Switzerland, Turkey, and China are excluded from the sample, as are all observations for the commodities of woollen clothing and ships. In addition to these exclusions, a further 92 commodity–country observations were removed from the sample because the corresponding export values for these observations are not bilaterally disaggregated in Britain's trade statistics.<sup>25</sup> For many commodity exports, Britain's trade statistics report a residual category of 'Other foreign countries', alongside individually specified bilateral export destinations. It appears that, for a given commodity, countries taking a very small value of exports are relegated to the residual category of 'Other foreign countries'. Towards the end of this section, an attempt will be made to correct for the exclusion of the 92 low-export-value observations.

For the main sample of 546 commodity–country observations, the following cross-sectional regression equation is used to estimate the elasticity of Britain's manufactured commodity exports to foreign tariffs:

$$\ln(X_{j,n}) = \beta_0 + \beta_1 \ln(1 + \tau_{j,n}) + \gamma_j + \delta_n + \varepsilon_{j,n} \quad (1)$$

<sup>22</sup> Effective tariffs measure the protection afforded to domestic value-added, after accounting for the factor-share of imported material inputs and any tariffs thereon. Nevertheless, nominal and effective tariffs were highly correlated historically, as has been demonstrated in the case of American tariffs on a sample of industries in 1899 and 1904; see Hawke, 'Industrial protection', p. 92.

<sup>23</sup> Schlote, *British overseas trade*, p. 74.

<sup>24</sup> Tyszynski, 'Manufactured commodities', p. 277. In 1899, textiles comprised 46% of Britain's manufactured exports, but only 20% and 8% of the manufactured exports of Germany and the United States, respectively.

<sup>25</sup> *Trade of the United Kingdom, 1902* and *Trade of the United Kingdom, 1906*.

**TABLE 1** Descriptive statistics of commodity tariffs, 1902

Commodity	Minimum tariff (%)	Maximum tariff (%)	Mean tariff (%)	Median tariff (%)	Coefficient of variation
Cotton yarns					
Cotton yarns, grey	0	70	16.0	7.5	1.23
Cotton yarns, bleached or dyed	0	76	18.3	12.0	1.09
Cotton manufactures					
Piece goods, unbleached	0	207	38.0	25.0	1.28
Piece goods, bleached	0	169	36.6	26.0	1.08
Piece goods, printed	3.5	246	51.4	41.0	1.09
Piece goods, dyed, &c.	3.5	191	37.2	23.3	1.15
Cotton thread for sewing	0	375	38.3	14.0	2.20
Woollen and worsted yarns					
Worsted yarn	0	160	28.3	9.0	1.48
Woollen and worsted manufactures					
Broad piece goods: heavy, all wool	5	115	31.6	17.0	1.10
Broad piece goods: heavy, mixed	5	268	53.4	27.0	1.34
Broad piece goods: light, all wool	5	97	28.1	14.0	1.05
Broad piece goods: light, mixed	5	230	48.2	25.0	1.25
Worsted coatings, all wool	5	128	34.6	19.0	1.11
Worsted coatings, mixed	5	220	46.1	24.0	1.28
Worsted stuffs, all wool	5	183	47.3	26.0	1.07
Worsted stuffs, mixed	5	181	39.8	22.0	1.13
Linen manufactures					
Linen piece goods	5	310	40.2	20.0	1.59
Machinery					
Textile machinery	0	45	8.6	7.0	1.22
Locomotives	0	45	10.0	9.0	1.22
Sewing machines	0	45	8.3	5.0	1.25
Iron and steel and manufactures thereof					
Pig iron	0	91	10.5	3.0	1.86
Rails	0	90	16.7	8.0	1.37
Galvanized corrugated sheets	0	122	25.5	16.0	1.14
Tin plates	0	110	19.0	6.0	1.49
Steel bars	0	42	11.2	4.0	1.23
Ships					
Ships	0	8	1.2	0.0	1.87
Apparel					
Woollen clothing	5	202	33.5	20.0	1.29
Leather manufactures					
Boots and shoes	5	281	47.9	22.5	1.37

(Continues)





TABLE 1 (Continued)

Commodity	Minimum tariff (%)	Maximum tariff (%)	Mean tariff (%)	Median tariff (%)	Coefficient of variation
Chemicals					
Sulphate of copper	0	41	5.6	2.0	1.62
Caustic soda	0	101	12.4	1.0	1.81
Bleaching powder	0	123	12.3	4.0	2.08

Notes: These descriptive statistics are calculated from the commodity tariffs of 23 countries: the countries in the Board of Trade's compilation excluding Turkey and China. See fig. 1 and app. 1. Several countries did not treat ships as an importable commodity, while the United States prohibited the importation of ships.

Source: *British and Foreign Trade* (1905), pp. 355–77.

In this equation,  $X$  represents exports.  $\tau$  represents the *ad valorem* equivalent tariff reported in the Board's compilation. The subscripts  $j$  and  $n$  represent, respectively, the tariff-imposing country and the manufactured commodity.  $\gamma$  is a country fixed effect, which captures not only the size of the economy but also any country-specific trade costs, such as distance. Moreover, the inclusion of this fixed effect controls for the country's stage of industrial development and dependence upon Britain for manufactured goods.  $\delta$  is a commodity fixed effect, which captures, *inter alia*, different relative productivities and levels of consumption across commodities, as well as commodity-specific trade costs.  $\varepsilon$  is the error term.

When expressed as  $1+\tau$ , the tariff variable measures the increase in the relative price, that is, the British price relative to the import-country price, resulting from the tariff.  $\beta_1$  is the elasticity of British exports to foreign tariffs. Table 2 presents the results of the regression, with the baseline specification reported in column 1. In all specifications, standard errors are clustered by commodity. The commodity-level elasticity of Britain's manufactured exports to foreign tariffs is 3.1, and it is statistically significant at the 1 per cent level. Sensitivity to foreign tariffs was not confined to only a small subset of commodities, such as pig iron or tinplate, but rather spanned a range of Britain's manufactured exports. On average, a tariff-induced 1 per cent increase in the relative price of imports from Britain had the effect of reducing British exports of that commodity to the foreign country by more than 3 per cent. This finding contradicts the traditional narrative that tariffs had little effect upon British exports in the decades before the First World War.<sup>26</sup>

The econometric literature on late-nineteenth-century British exports has used different empirical methods, and hence there is not much basis for historical comparisons of  $\beta_1$ .<sup>27</sup> Furthermore, an aggregation bias in the estimation of trade elasticities necessitates caution in making any comparison;  $\beta_1$  is not the macroeconomic elasticity to foreign tariffs but rather the average commodity-level elasticity to foreign tariffs as estimated from the 546-observation sample. One commodity-level point of comparison is the much lower estimated elasticity of 0.7 for British exports of pig iron to the United States and Canada.<sup>28</sup> Another useful basis for comparison is Zelder's estimated commodity-level price elasticities of demand – tariffs affect export volumes via

<sup>26</sup> Saul, *British overseas trade*, p. 165.

<sup>27</sup> Saul simply examined the magnitude of changes in selected commodity-level exports; see *ibid.* Hatton performed structural break tests; see Hatton, 'British exports'. Irwin estimated a probit regression; see Irwin, 'Tinplate industry'. The analyses of Jacks et al. and Varian involved trade costs as the dependent variable; see Jacks et al., 'Trade costs' and Varian, 'Bilateral tariff series'.

<sup>28</sup> Inwood and Keay, 'Transport costs', p. 112.





TABLE 2 Bilateral British commodity exports, 1902

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Tariff	-3.05*** (0.48)	-3.38*** (0.69)	-4.06*** (0.72)	-2.72*** (0.44)	-3.06*** (0.48)	-5.09*** (1.13)	-6.14*** (1.49)	-6.27*** (1.31)	-3.39*** (0.81)	-5.19*** (1.12)
Tariff × Cotton				-0.88 (0.71)					-3.15*** (1.13)	
Tariff × Iron/Steel					0.36 (1.03)					1.43 (1.44)
Constant	13.29*** (0.52)	10.93*** (0.40)	14.09*** (0.72)	13.39*** (0.59)	13.25*** (0.55)	16.23*** (0.65)	13.42*** (0.53)	16.60*** (0.67)	16.17*** (0.62)	16.15*** (0.64)
Commodity fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Estimation	OLS	OLS	OLS	OLS	OLS	PPML	PPML	PPML	PPML	PPML
N	546	446	511	546	546	638	522	592	638	638
R <sup>2</sup>	0.55	0.55	0.53	0.55	0.55					
Pseudo-R <sup>2</sup>						0.67	0.70	0.67	0.69	0.67

Notes: \*\*\* indicates statistical significance at the 1% level. Robust standard errors have been clustered by commodity and are reported in parentheses. The dependent variable is in natural logarithms in OLS estimations (cols. 1–5) and in levels in PPML estimations (cols. 6–10). All explanatory variables are expressed in natural logarithms. Cols. 1, 4, 5, 6, 9, and 10 include the full sample. Cols. 2 and 7 exclude from the sample those commodity exports to the highly protectionist countries of Russia, Spain, the United States, and Portugal. Cols. 3 and 8 exclude all observations for which the *ad valorem* equivalent tariff exceeds 100%. In the PPML estimations (cols. 6–10), export observations not disaggregated in the British trade statistics are included in the sample and treated as zeros; see section II of the text. PPML = Poisson pseudo-maximum likelihood.

Source: Author's creation.



prices – for British exports during the interwar era, which were, on average, around 3.<sup>29</sup> Of the 37 commodities in Zelder's sample, 10 are also included in the Board's compilation, and for these 10 commodities, the median (interwar-era) elasticity was 2.6.<sup>30</sup> This study's estimated elasticity of 3.1 is also very consistent with elasticities estimated using modern world trade data. Kee et al. also estimated an average elasticity for Harmonized System 6-digit (HS6) level commodities of 3.1, while Soderbery found an average elasticity of 3.4.<sup>31</sup> Such comparisons suggest that the sensitivity of British exports to foreign tariffs was not low.

Column 2 of table 2 excludes from the sample those commodity exports to Russia, Spain, the United States, and Portugal. These countries had very high average bilateral tariffs toward Britain, as evident from figure 1. Within the Board's compilation, the median commodity tariff for these high-tariff countries was 76 per cent, whereas the median was only 10 per cent for other countries. Some of the tariffs were stratospherically high, such as the Russian tariff of 310 per cent on linen piece goods and the American tariff of 375 per cent on cotton thread. Especially for the relatively industrialized United States, many of its high tariffs would have been redundant, that is, exceeding the domestic-import price differential, by 1902. Even during the United States's early industrialization in the antebellum era, the American tariff on coarse cotton cloth was redundant, certainly before 1846.<sup>32</sup> If British exports were unresponsive to marginal changes in such high tariffs, then the inclusion of these tariffs in the regression sample would bias the estimated (average) commodity-level elasticity downward. Excluding the high-tariff countries from the sample raises the elasticity to 3.4. In a related exercise, column 3 excludes from the sample all commodity observations for which the *ad valorem* equivalent tariff was extremely high, defined as 100 per cent or higher, regardless of whether the tariff was imposed by one of the four aforementioned (high-tariff) countries or by any other country. The exclusion of these observations raises the elasticity, unsurprisingly, from 3.1 to 4.1.

The finding that Britain's manufactured exports were elastic to foreign tariffs invites the counterfactual question: how much greater would the value of Britain's exports have been in a world of free trade in manufactures, that is, if foreign countries had simply emulated Britain's trade policy? For this partial-equilibrium counterfactual analysis, the coefficients in columns 1 and 2 are used. Reducing every commodity tariff to 0 would increase the (within-sample) total value of exports above the predicted value by 109 per cent (column 1) or 57 per cent (column 2). The lower counterfactual increase for column 2, in which the high-tariff countries are excluded from the sample, is consistent with expectation. Under a constant elasticity, the removal of high and quite possibly redundant foreign tariffs would overstate the counterfactual value of British exports. A counterfactual increase in British exports of 57 per cent is in line with other historical counterfactual estimates. Using a gravity model, Estevadeordal et al. estimated that, in 1913 (when world tariffs were generally lower than in 1902), world trade would have been one-third higher with the removal of all tariffs.<sup>33</sup> Mitchener and Weidenmier estimated that, from 1870 to 1913, the existence

<sup>29</sup> Zelder, 'Estimates of elasticities'.

<sup>30</sup> Ibid., p. 43. The 10 common commodities are caustic soda; pig iron; galvanized plates and sheets; tinned and tinned plates and sheets; railway tracks; sewing machines; bleached and coloured cotton cloth; unbleached cotton cloth; cotton yarn; and woollen fabrics.

<sup>31</sup> Kee et al., 'Import demand elasticities', p. 675 and Soderbery, 'Trade elasticities', p. 53.

<sup>32</sup> Harley, 'Different products', p. 802. When the duty on cotton cloth was reduced to only 25% under the Walker Tariff of 1846, the duty was still highly prohibitive. For a debate over the dependence of lower-thread-count American cotton cloth production on protection, see also Harley, 'International competitiveness' and Irwin and Temin, 'Antebellum tariff'.

<sup>33</sup> Estevadeordal et al., 'Rise and fall', p. 391.



of a preferential trade agreement raised bilateral trade by 26 per cent to 168 per cent, depending on the specification.<sup>34</sup>

It must be emphasized that this counterfactual increase in British exports is estimated in partial equilibrium and, thus, is likely to overstate the effect of the removal of foreign tariffs. A 57 per cent increase in British exports, the equivalent of nearly 10 per cent of gross domestic product (GDP) in 1902, would have necessitated a major restructuring of the British economy.<sup>35</sup> Such an increase in export-sector production would have required an increase in the relative price of Britain's exports, which would partly offset the estimated effect. Moreover, an expansion of Edwardian Britain's export sector, with its alleged over-commitment to the technologically mature 'old staples', would probably have hampered export (and output) growth, to some degree, in the longer term.<sup>36</sup>

How much higher would Britain's export growth rate have been if the trade-liberalizing currents of the mid-nineteenth century persisted into the late nineteenth century, culminating in worldwide free trade in manufactures by 1902? Using the more conservatively estimated counterfactual increase of 57 per cent in 1902, and assuming the same per cent increase for the out-of-sample commodities, Britain's export volume growth rate from 1872–1902 would have been 3.4 per cent per annum, instead of 1.9 per cent per annum.<sup>37</sup> By comparison, the rate had previously been 4.5 per cent per annum from 1854 to 1872, that is, the conventional periodization of mid-Victorian export growth.<sup>38</sup> Of course, this counterfactual growth rate is no more reliable than the partial-equilibrium estimate of the increase in exports. Whether Britain's factor inputs would have been sufficiently elastic to permit such an improved rate of late-Victorian export growth is a question over which scholarly opinion has been divided.<sup>39</sup> Still, a worldwide movement toward free trade would have substantially counteracted the deceleration of Britain's exports, to an extent far greater than might be suggested by Saul's often-cited claim that 'it seems unlikely that in the period before 1914 tariffs seriously hindered the development of British trade taken as a whole'.<sup>40</sup>

Two industries have featured particularly prominently in the literature on British economic history and, indeed, in Britain's economic history itself. The first of these two industries is cotton, which corresponds to the Board's commodity groups of cotton manufactures and cotton yarn. The cotton industry was *the* staple industry in British manufacturing, constituting 44 per cent of Britain's manufactured exports in 1902.<sup>41</sup> Among Britain's manufacturing industries in 1900, its comparative advantage was greatest in the cotton industry.<sup>42</sup> Moreover, in 1907, Britain's relative labour productivity (*vis-à-vis* the United States) in the cotton industry was among the highest of

<sup>34</sup> Mitchener and Weidenmier, 'Trade and empire', p. 1826.

<sup>35</sup> Solomou and Thomas, 'Feinstein fulfilled', p. 25.

<sup>36</sup> For the seminal articulation of the over-commitment thesis, see Richardson, 'Over-commitment in Britain'.

<sup>37</sup> Imlah, *Economic elements*, pp. 97–8.

<sup>38</sup> *Ibid.*, pp. 96–7.

<sup>39</sup> Meyer, 'British industrial production'; McCloskey, 'Victorian Britain'; and Feinstein, 'British economic growth', pp. 83–7.

<sup>40</sup> Saul, *British overseas trade*, p. 165.

<sup>41</sup> Schlote, *British overseas trade*, p. 125.

<sup>42</sup> Varian, 'Manufacturing comparative advantages'. See also Crafts, 'Revealed comparative advantage', p. 130, which finds that the textile industry, including non-cotton textiles, ranked third out of 16 British industries, with respect to comparative advantage. The highest ranked industry was rail and ship, followed by iron and steel.



Britain's manufacturing industries.<sup>43</sup> Was the elasticity to foreign tariffs different for this leading class of British exports? Equation (1) is modified to include a term that interacts the tariff variable with a dummy variable, *Cotton*, taking a value of 1 for all observations within the commodity groups of cotton manufactures (consisting of five representative commodities) and cotton yarn (consisting of two representative commodities):

$$\ln(X_{j,n}) = \beta_0 + \beta_1 \ln(1 + \tau_{j,n}) + \beta_2 [\ln(1 + \tau_{j,n})](\text{Cotton}) + \gamma_j + \delta_n + \varepsilon_{j,n} \quad (2)$$

Column 4 of table 2 presents the estimated coefficients for this regression. While the coefficient of  $\beta_2$  is negative, thereby raising the (absolute value of) the commodity-level elasticity of Britain's cotton exports to foreign tariffs, the coefficient of  $\beta_2$  is statistically insignificant at any conventional level.

The second industry to have been well analysed in the literature on British economic history is the iron and steel industry. The Board's compilation of tariffs for 1902 coincides with a period of immense change in the international market for iron and steel. Beginning in the 1890s, a shift in the Anglo-American relative price of material inputs resulted in the emergence of the United States as internationally competitive in iron and steel.<sup>44</sup> In addition, the growth of German exports of iron and steel was nothing short of meteoric after 1900, with German exports having well surpassed British exports by 1910.<sup>45</sup> Equation (2) is re-estimated, but with the dummy variable now taking a value of 1 for all observations within the commodity group of iron and steel manufactures (consisting of five representative commodities). Column 5 of table 2 presents the estimated coefficients for this regression. As with the coefficient for cotton manufactures, the estimated coefficient for iron and steel manufactures is statistically insignificant, indicating that the elasticity for iron and steel manufactures did not significantly differ from the elasticity for manufactured commodities more generally.

Excluding those 92 observations for which the corresponding export value was low (and which were not individually reported in Britain's trade statistics) could result in a biased estimation of the elasticity of exports to foreign tariffs. If a commodity was highly elastic to a foreign tariff, such that the imposed tariff reduced imports to a very low value, pushing the observation out of the sample, then the estimated average commodity-level elasticity would be reduced. Therefore, each of the specifications in columns 1–5 of table 2 are re-estimated in columns 6–10 for an enlarged sample that reinstates the 92 commodity–country observations, assuming an export value of zero for each of these observations. The expectation is that the inclusion of these low-export-value observations will raise the elasticity. Owing to the presence of many zeros in the enlarged sample, the Poisson pseudo-maximum likelihood (PPML) method is used to estimate the elasticity.<sup>46</sup> In every PPML specification, the elasticity is substantially higher than in its counterpart ordinary least squares (OLS) specification. For this reason, 3.1 should be considered a lower estimate of the commodity-level elasticity of Britain's manufactured exports to foreign tariffs. In column 9, the estimated interaction coefficient for cotton manufactures is now statistically significant. According to the PPML results, the elasticity of cotton manufactures was nearly double the elasticity of

<sup>43</sup> Broadberry, *Productivity race*, pp. 28–30. In 1907–9, labour productivity was 109% higher in American manufacturing than in British manufacturing. However, the American lead in labour productivity was 'only' 51% in the cotton industry.

<sup>44</sup> Irwin, 'Explaining America's surge'.

<sup>45</sup> Broadberry, *Productivity race*, p. 166. For an account of the reasons for the growth in American and German iron and steel exports, see Allen, 'Iron and steel'.

<sup>46</sup> Santos Silva and Tenreiro, 'Log of gravity'.



non-cotton manufactures, suggesting that the leading British industry of the nineteenth century was particularly vulnerable to the vicissitudes of foreign trade policy.<sup>47</sup>

There is the possibility that foreign tariffs were endogenous, with policymakers increasing tariffs in response to high or rising imports from Britain. In the absence of a suitable instrument for tariffs, this study emulates the approach of Fontagné et al. in assessing whether foreign tariffs were altered in response to imports from Britain.<sup>48</sup> Their approach involves calculating the correlation between commodity-specific tariff changes and commodity-specific import changes occurring across an interval preceding the tariff changes. The United States's Dingley Tariff of 1897 was enacted not long before the Board of Trade's tariff compilation. Manufacturing-industry-specific bilateral (American) import values from Britain and the corresponding bilateral tariff rates are obtained from the data underlying Varian.<sup>49</sup> The log-difference of the manufacturing-industry-specific bilateral tariff between 1896/7 and 1898/9 (spanning the Dingley Tariff) is correlated with the log-difference in imports from Britain between 1894/5 and 1896/7.<sup>50</sup> The correlation coefficient is positive but statistically insignificant at any conventional level ( $p = 0.13$ ).<sup>51</sup> In the late nineteenth century, France was rare among countries insofar as its trade statistics reported industry-specific bilateral imports and bilateral customs duties, thereby enabling the calculation of industry-specific bilateral tariffs.<sup>52</sup> Although fully a decade before the Board's tariff compilation, the Méline Tariff of 1892 was a substantial revision of France's tariff schedule. The log-difference of the manufacturing-industry-specific bilateral tariff between 1891 and 1893 (spanning the Méline Tariff) is correlated with the log-difference in imports from Britain between 1889 and 1891. The correlation coefficient for France is positive but, again, statistically insignificant ( $p = 0.69$ ).<sup>53</sup> Like Fontagné et al., this research note suggests that tariff-setting was not responsive to trends in bilateral imports.<sup>54</sup>

### III | CONCLUSION

What is most surprising is that previous literature has suggested that British exports were immune to foreign tariffs in the decades before the First World War.<sup>55</sup> Using the commodity- and country-specific cross-sectional foreign tariff data that Britain's Board of Trade compiled for the year 1902, this study found that Britain's manufactured exports were elastic to foreign tariffs, with the

<sup>47</sup> This finding accords with that of Huberman et al., 'Second industrial revolution'. In their study of late-nineteenth-century Belgian exports, they found that the elasticity of exports to variable trade costs, such as tariffs, was inversely related to the degree of product differentiation. In that study, cotton manufactures were classified as relatively undifferentiated commodities.

<sup>48</sup> Fontagné et al., 'Product-level trade elasticities', p. 20.

<sup>49</sup> Varian, 'Bilateral tariff series'.

<sup>50</sup> More precisely, it is the log-difference of  $1+\tau$ , as in Fontagné et al., 'Product-level trade elasticities'. A pre-tariff interval of two years is selected because, if it was extended earlier than 1894/5, it would span the Wilson-Gorman Tariff of 1894.

<sup>51</sup> There are 13 manufacturing industries in Varian, 'Bilateral tariff series'.

<sup>52</sup> *Commerce de la France* (1890, 1892, and 1894).

<sup>53</sup> In the section of the French trade statistics reporting bilateral imports from Britain, there are 48 manufacturing industries for which import values and customs duties are consistently reported for 1889, 1891, and 1893; see *ibid*.

<sup>54</sup> Fontagné et al., 'Product-level trade elasticities', pp. 20–2.

<sup>55</sup> Saul, *British overseas trade*, p. 165; Hatton, 'British exports', p. 585; and Jacks et al., 'Trade costs', p. 135.



estimated elasticity of 3.1 being broadly consistent with elasticities estimated from modern trade data.

A counterfactual estimate is that worldwide free trade in manufactures would have raised British exports by as much as 57 per cent in 1902. Because this figure was estimated in partial equilibrium, it should be treated as a rather loose approximation (and overestimation) of the effect of the removal of foreign tariffs. Nonetheless, if in the last decades of the nineteenth century there had been a liberalization of trade policy rather than a protectionist backlash, much of the post-1872 deceleration in British exports might have been avoided. Although this research note has been concerned with the link between foreign tariffs and British exports, future research might extend this finding into the longstanding debate over the existence of export-retarded output and productivity growth in late-Victorian and Edwardian Britain.<sup>56</sup>

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## DATA

Varian, B. D., 'Replication data for: "British exports and foreign tariffs: insights from the Board of Trade's foreign tariff compilation for 1902"', *Harvard Dataverse*, V1.

## REFERENCES

- Allen, R. C., 'International competition in iron and steel, 1850–1913', *Journal of Economic History*, 39 (1979), pp. 911–37.
- Bairoch, P., 'European trade policy, 1815–1914', S. Burke, trans., in P. Mathias and S. Pollard, eds., *The Cambridge economic history of Europe VIII: The industrial economies: the development of economic and social policies* (Cambridge, 1989), pp. 1–160.
- Broadberry, S. N., *The productivity race: British manufacturing in international perspective, 1850–1990* (Cambridge, 1997).
- Coppock, D. J., 'The climacteric of the 1890's: a critical note', *Manchester School*, 24 (1956), pp. 1–31.
- Crafts, N. F. R., 'Revealed comparative advantage in manufacturing, 1899–1950', *Journal of European Economic History*, 18 (1989), pp. 127–37.
- Crafts, N. F. R. and Mills, T. C., 'Sooner than you think: the pre-1914 UK productivity slowdown was Victorian not Edwardian', *European Review of Economic History*, 24 (2020), pp. 736–48.
- Dunham, A. L., 'The influence of the Anglo-French Treaty of Commerce of 1860 on the development of the iron industry in France', *Quarterly Journal of Economics*, 41 (1927), pp. 317–37.
- Dunham, A. L., 'The development of the cotton industry in France and the Anglo-French Treaty of Commerce of 1860', *Economic History Review*, 1st ser., I (1928), pp. 281–307.
- Engerman, S., 'The American tariff, British exports and American iron production, 1840–1860', in D. McCloskey, ed., *Essays on a mature economy: Britain after 1840* (Princeton, NJ, 1971), pp. 13–37.
- Estevadeordal, A., Frantz, B., and Taylor, A. M., 'The rise and fall of world trade, 1870–1939', *Quarterly Journal of Economics*, 118 (2003), pp. 359–407.

<sup>56</sup> Meyer, 'British industrial production'; Coppock, 'Climacteric of the 1890's'; McCloskey, 'Victorian Britain'; McCloskey, 'Foreign industrialization'; Lewis, *Growth and fluctuations*, pp. 118–20; Feinstein, 'British economic growth'; and Crafts and Mills, 'UK productivity slowdown'.





- Feinstein, C., 'Exports and British economic growth (1850–1914)', in P. Mathias and J. A. Davis, eds., *International trade and British economic growth from the eighteenth century to the present day* (Cambridge, Mass., 1996), pp. 76–95.
- Fontagné, L., Guimbard, H., and Orefice, G., 'Tariff-based product-level trade elasticities', *Journal of International Economics*, 137 (2022), 103593.
- Harley, C. K., 'International competitiveness of the antebellum American cotton textile industry', *Journal of Economic History*, 52 (1992), pp. 559–84.
- Harley, C. K., 'The antebellum tariff: different products or competing sources? A comment on Irwin and Temin', *Journal of Economic History*, 61 (2001), pp. 799–805.
- Hatton, T. J., 'The demand for British exports, 1870–1913', *Economic History Review*, 2nd ser., XLIII (1990), pp. 576–94.
- Hawke, G. R., 'The United States tariff and industrial protection in the late nineteenth century', *Economic History Review*, 2nd ser., XXVIII (1975), pp. 84–99.
- Huberman, M., Meissner, C. M., and Oosterlinck, K., 'Technology and geography in the second industrial revolution: new evidence from the margins of trade', *Journal of Economic History*, 77 (2017), pp. 39–89.
- Imlah, A. H., *Economic elements in the Pax Britannica: studies in British foreign trade in the nineteenth century* (Cambridge, Mass., 1958).
- Inwood, K. and Keay, I., 'Transport costs and trade volumes: evidence from the trans-Atlantic iron trade, 1870–1913', *Journal of Economic History*, 75 (2015), pp. 95–124.
- Irwin, D. A., 'Changes in U.S. tariffs: the role of import prices and commercial policies', *American Economic Review*, 88 (1998), pp. 1015–26.
- Irwin, D. A., 'Did late-nineteenth-century U.S. tariffs promote infant industries? Evidence from the tinplate industry', *Journal of Economic History*, 60 (2000), pp. 335–60.
- Irwin, D. A., 'Explaining America's surge in manufactured exports, 1880–1913', *Review of Economics and Statistics*, 85 (2003), pp. 364–76.
- Irwin, D. A. and Temin, P., 'The antebellum tariff on cotton textiles revisited', *Journal of Economic History*, 61 (2001), pp. 777–98.
- Jacks, D. S., Meissner, C. M., and Novy, D., 'Trade costs in the first wave of globalization', *Explorations in Economic History*, 47 (2010), pp. 127–41.
- Kee, H. L., Nicita, A., and Olarreaga, M., 'Import demand elasticities and trade distortions', *Review of Economics and Statistics*, 90 (2008), pp. 666–82.
- Knowles, L. C. A., *The economic development of the British overseas empire 2: Comparative view of Dominion problems: Canada* (London, 1930).
- Lewis, W. A., *Growth and fluctuations, 1870–1913* (London, 1978).
- McCloskey, D. N., 'Did Victorian Britain fail?', *Economic History Review*, 2nd ser., XXIII (1970), pp. 446–59.
- McCloskey, D. N., 'Britain's loss from foreign industrialization: a provisional estimate', *Explorations in Economic History*, 8 (1970), pp. 141–52.
- Meyer, J. R., 'An input-output approach to evaluating the influence of exports on British industrial production in the late 19th century', *Explorations in Entrepreneurial History*, 8 (1955), pp. 12–34.
- Mitchener, K. J. and Weidenmier, M., 'Trade and empire', *Economic Journal*, 118 (2008), pp. 1805–34.
- O'Rourke, K. H., 'Tariffs and growth in the late 19th century', *Economic Journal*, 110 (2000), pp. 456–83.
- Richardson, H. W., 'Over-commitment in Britain before 1930', *Oxford Economic Papers*, 17 (1965), pp. 237–62.
- Sandberg, L. G., *Lancashire in decline: a study in entrepreneurship, technology, and international trade* (Columbus, 1974).
- Santos Silva, J. M. C. and Tenreiro, S., 'The log of gravity', *Review of Economics and Statistics*, 88 (2006), pp. 641–58.
- Saul, S. B., 'The export economy, 1870–1914', *Bulletin of Economic Research*, 17 (1965), pp. 5–18.
- Saul, S. B., *Studies in British overseas trade, 1870–1914* (Liverpool, 1960).
- Schlote, W., *British overseas trade from 1700 to the 1930s*, W. O. Henderson and W. H. Chaloner, trans. (Oxford, 1952).
- Soderbery, A., 'Trade elasticities, heterogeneity, and optimal tariffs', *Journal of International Economics*, 114 (2018), pp. 44–62.
- Solomou, S. and Thomas, R., 'Feinstein fulfilled: updated estimates of UK GDP, 1841–1920', Economic Statistics Centre of Excellence Technical Report no. 4 (2019).
- Tyszynski, H., 'World trade in manufactured commodities, 1899–1950', *Manchester School*, 19 (1951), pp. 277–304.





- Varian, B. D., 'Anglo-American trade costs during the first era of globalization: the contribution of a bilateral tariff series', *Economic History Review*, 71 (2018), pp. 190–212.
- Varian, B. D., 'The manufacturing comparative advantages of late-Victorian Britain', *Cliometrica*, 14 (2020), pp. 479–506.
- Varian, B. D., 'Imperial preference before the Ottawa Agreements: evidence from New Zealand's Preferential and Reciprocal Trade Act of 1903', *Economic History Review*. <https://doi.org/10.1111/ehr.13142>.
- Zelder, R. E., 'Estimates of elasticities of demand for exports of the United Kingdom and the United States, 1921–1938', *Manchester School*, 26 (1958), pp. 33–47.

## OFFICIAL PUBLICATIONS

- Annual Statement of the Trade of the United Kingdom with Foreign Countries and British Possessions, 1902* (P.P. 1903, LXIX–LXX).
- Annual Statement of the Trade of the United Kingdom with Foreign Countries and British Possessions, 1906* (P.P. 1907, LXXXII–LXXXIII).
- Memoranda, Statistical Tables, and Charts Prepared in the Board of Trade with Reference to Various Matters Bearing on British and Foreign Trade and Industrial Conditions* (P.P. 1903, LXVII), Memorandum (with tabular statements) on the comparative incidence of foreign and colonial import tariffs on the export trade of the United Kingdom.
- Second Series of Memoranda, Statistical Tables, and Charts Prepared in the Board of Trade with Reference to Various Matters Bearing on British and Foreign Trade and Industrial Conditions* (P.P. 1905, LXXXIV), The comparative incidence of foreign and colonial import tariffs on the principal classes of manufactures exported from the United Kingdom.
- Tableau Générale du Commerce de la France avec ses Colonies et les Puissances Étrangères pendant l'Année 1889* (Paris, 1890).
- Tableau Générale du Commerce de la France avec ses Colonies et les Puissances Étrangères pendant l'Année 1891* (Paris, 1892).
- Tableau Générale du Commerce de la France avec ses Colonies et les Puissances Étrangères pendant l'Année 1893* (Paris, 1894).

## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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## APPENDIX 1

Commodity- and country-disaggregated export data for Britain were obtained from the *Annual Statements of the Trade of the United Kingdom with Foreign Countries and British Possessions* for the years 1902 and 1906, which each report retrospective data for the preceding five years. The commodity- and country-disaggregated foreign tariff data were obtained from the *Second Series of Memoranda, Statistical Tables, and Charts Prepared in the Board of Trade with Reference to Various Matters Bearing on British and Foreign Trade and Industrial Conditions*. As noted in the text, the Board of Trade compiled foreign tariff data for 31 representative commodities exported to 25 countries, implying a sample of 775 commodity–country observations. However, the sample in this research note includes 546 observations. Here, the excluded observations are detailed.

Although the Board compiled tariff data for Switzerland, none of the observations for exports to Switzerland are included in the sample, because Switzerland did not appear in the *Trade of the United Kingdom* until 1904. Prior to 1904, the British trade statistics used the ‘country of destination’ system (as opposed to the ‘country of consignment’ system), whereby exports were reported according to the country of the port to which they were most immediately destined. None of the observations for Turkey and China are included in the sample. Although the Board reported average bilateral tariffs for these countries, the Board did not report the underlying commodity tariffs for these countries, for reasons unknown. Neither of these markets was especially large, with Turkey and China taking 2.1 per cent and 2.5 per cent of Britain’s total exports in 1902, respectively.

While exports to the South African Customs Union would include exports to both the Cape of Good Hope and Natal, the observations for the South African Customs Union only relate to the Cape of Good Hope. Since Natal is only occasionally disaggregated in the commodity-level British export data, limiting exports to the South African Customs Union to only those exports to the Cape of Good Hope allows for a greater number of observations while preserving comparability across those observations.

The observations for woollen clothing are excluded from the sample because this commodity was only separately reported in the British export data beginning in 1904, even though the Board compiled foreign tariff data for woollen clothing for 1902. Ships are excluded from the sample because a number of countries either did not treat ships as an import or prohibited the importation of ships. Additionally, the *Trade of the United Kingdom* excludes the value of non-new ships from the reported value of ships exported.

Various commodity–country observations were eliminated from the sample because the foreign tariff data could not be matched to a commodity- and country-disaggregated export value for the year 1902. The commodity- and country-disaggregation in the *Trade of the United Kingdom* is incomplete, with export values sometimes relegated to a residual category of ‘Other foreign countries’. Occasionally, exports to a country of a particular commodity were not separately reported in the volume for 1902 but were separately reported in the retrospective data in the volume for 1906. By consulting the volume for 1906, the removal of some observations from the sample was avoided. Altogether, 92 commodity–country observations were inevitably removed from the sample owing to incomplete disaggregation in the *Trade of the United Kingdom*.