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### Historical precedents of global markets

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**Historical Precedents of Global  
Markets**

Research Memorandum GD-43

Rainer Fremdling

Groningen Growth and Development Centre  
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## Historical Precedents of Global Markets

by Rainer Fremdling

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During the 19th century, European countries not only industrialised heavily but they also traded with each other and with overseas areas in an until hitherto unknown degree. By 1913, a globalised economy had emerged, which - after the draw-back of the two world wars and the disintegration of the world economy occurring between these wars - did not reappear before the 1960s or even 1970s.<sup>1)</sup>

Based on the available data on foreign trade<sup>2)</sup> and world production,<sup>3)</sup> it seems pretty clear that, roughly between 1820 and 1913, world trade augmented significantly faster than the world-wide production. Whereas on average the production per capita grew at a rate of 7.3 percent per decade the comparable volume of foreign trade increased at the same time by 33 percent. During roughly the same period in the 19th century, world's output per capita multiplied by 2.2 percent whereas world's foreign trade volume per capita grew 25-fold. Only partly can this enormous increase in volume be explained by expanded trade among overseas regions. It was rather above all the advanced countries which traded with each other. The regional distribution of world trade reveals a clear European domination during the 19th and early 20th century. World trade comprised mainly intra-European exchange of goods crossing borders and European trade with overseas countries of European settlement.<sup>4)</sup> This European domination lasted until the first world war although north American shares increased whereas Great Britain's position deteriorated. Around 1913, still two thirds of world trade involved Europe.

From table 1 it becomes patent that Great Britain remained the leader in foreign trade for most of the 19th century making up nearly one quarter of the world-wide foreign trade. Second in Europe were

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<sup>1)</sup> Foreman-Peck, 1995, p. 116.

<sup>2)</sup> See table 1. Rostow and others (e.g. Kuznets, Kenwood/Lougheed etc.) derived their data for the period before 1913 directly or indirectly from the estimates by Mulhall (1892 or 1899) and Neumann Spallart (1880 ff.).

<sup>3)</sup> See the most recent compilation by Maddison, 1995.

<sup>4)</sup> The available figures, however, may be biased towards Europe and underestimate trade among east-Asian countries.

France and Germany. European countries depended more and more on exports and imports. In 1910, the large European countries exported 17.5 percent (Great Britain), 15.3 percent (France) and 14.6 percent (Germany) of their GDP.<sup>5)</sup>

There were two necessary preconditions for a globalised world economy to emerge already before the first world war. Firstly, the governments had to decide for a policy to enhance foreign trade.<sup>6)</sup> Secondly, innovations or technological progress had to revolutionise the transport sector which resulted in ever decreasing costs for transports within and among countries.

### Foreign Trade Policies

Three typical cases of foreign trade policy in Europe are outlined. These concern Great Britain, France and Germany.<sup>7)</sup> The classical country of free trade is of course the United Kingdom. One should not forget, however, that during the crucial years of her industrial revolution, i.e. from the late 18th to the first decades of the 19th century, the UK did not adhere to a regime of free trade. This was not achieved before the 1840s. During the 18th century, the UK had a complicated system of import-, export- and transit-duties. At the end of the 18th century, France and the UK negotiated over reducing trade restrictions (1786), but instead a war between them, from 1793 onwards, drove import duties up. The import duties were the main source for financing the British state budget and hence the war. This kind of tax was not sufficient for financing the war efforts, though. Furthermore, government debt increased by three times until the defeat of Napoleon and for the first time in history, even an income tax was introduced. Before the war, import duties had made up 25 percent of the import value on average. After the war a level of 45 percent was reached and it increased to 60 percent in 1821/22 because the income tax ("war tax") was then abolished and the state loans ("war loans") had to be served. In 1815, the state debt amounted to three times of GDP and two thirds of taxes had to be used for serving the debt.<sup>8)</sup> Although the supporters of free trade gained a great ascendancy fiscal considerations limited the latitude of the government.

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<sup>5)</sup> Bairoch, 1976, p. 79.

<sup>6)</sup> This was accompanied by governments' decisions to gradually let also people and capital move freely, Tilly, 1999, p. 23-28.

<sup>7)</sup> For an extended version see Fremdling, 1988; for details see also Wagner, 1889-1910; Capie, 1994; McCloskey, 1980; Harley and McCloskey, 1981; Harley, 1994.

<sup>8)</sup> This is a statement of Patrick O'Brien pointed out at the International Economic History Congress in August 1998 at Madrid. This increase in debt was not solely a result of the war against France, but also of 18 successful wars above all against the economic rival, Holland.

What were the major reasons interest groups put forth in favour of free trade? First of all the noted arguments of classical economists as Adam Smith and David Ricardo were put forward by liberals. I refrain from elaborating on their familiar reasoning concerning specialisation and comparative advantage. Less well known is the second argument, which in retrospect was stressed by the political economist Cunningham around 1900.<sup>9)</sup> According to him, free trade was in the self-interest of British industrialists in order to assure them of the monopoly on the production of industrial goods as long as possible. Starting point of such a "free trade imperialism" was the fact that Great Britain enjoyed a natural advantage concerning iron and hard coal and a monopoly on mechanical production processes. In order to maintain this position industrialisation abroad should be hindered. To achieve this goal other countries had to be open to exports of British industrial products. For their part these countries had to be allowed to sell agricultural products and raw materials to the UK in order to create enough purchasing power abroad for buying British industrial goods. The third argument for free trade concerned the price of food and the level of wages. As prices of cereals were considered to determine the wage level industrialists and also representatives of the working class opposed the (nearly) prohibitive corn laws, which kept the price for agricultural products rather high in Britain. Opposition against free trade or reasons to keep import duties were twofold. Firstly, land owners who held a majority in parliament profited from the corn laws. Secondly, for fiscal considerations, the government needed the revenues from tariffs on imported goods. Until 1840, some moderate reforms towards lower and more rational tariffs were carried out. As finished products like cloth were major export products of British firms the duty on raw wool or raw cotton had led to a negative protection. To counter this the import duties on raw material were then lowered or even abolished. But in 1840, still a lot of import duties existed and the state budget drew 50 percent of its revenues from these import duties. On average, they made up 30 percent of the value of imported goods. With the government of Sir Robert Peel as prime minister (1841-1846) a number of liberal reforms were pursued. Concerning the tariffs the first cautious steps were taken in 1842 when the import duties on 54 goods were abolished. The remaining duties, which still served as major state revenue, were grouped according to the following principles: raw materials were taxed at a maximum of 5 percent of the value, intermediate goods correspondingly with 12 percent and finished products bore 20 percent as maximum.

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<sup>9)</sup> Cunningham, 1905, pp. 38-66.

Very important was that Peel (re)introduced an alternative source of revenues, namely the income tax. The movement towards abolishing or lowering tariff barriers was thus accompanied by tentative steps to ensure fiscal security otherwise. For financing government's expenditure state debt still prevailed, decreasing though.<sup>10)</sup>

The corn laws, not yet repealed, were opposed heavily within parliament and the Anti-Corn Law League founded in 1839 gathered working class representatives and liberals to attack this regulation powerfully. Although the sliding scale or the threshold of duties against imports of grain was very high, from the 1830s onwards, imports of cereals were more and more necessary to meet the demand of the rapidly increasing population.<sup>11)</sup> In the first industrial nation, an ever growing share of the population working outside agriculture had to be fed. Because of the corn laws, the prices for grain in Britain were far above world market levels, (see the prices for Berlin and London in graph 1). As British agriculture, in terms of labour productivity, had become the most efficient in Europe<sup>12)</sup> it needed no protection to remain competitive on the home market for food. Hence the high price levels were not at all justified. In order to repeal the corn laws in compliance with the implementation of a general free trade regime an exogenous inducement was necessary, though. In 1845, the last preindustrial famine in western Europe hit also the UK, namely Ireland. There millions died or left the country and the extraordinary high food prices due to bad harvests in succession was the final blow to the corn laws. To make it possible to draw on cheaper overseas supplies of cereals the corn laws successively were repealed between 1846-1849. In addition, all protective import duties on industrial products and raw materials disappeared. The navigation laws were also dismissed. For the sake of fiscal purposes, still 48 luxury goods like coffee, tea, tobacco and brandy had to bear an import duty, though, which was equal to the internal indirect turnover tax. Together with the income tax these indirect taxes were sufficient to generate the revenues needed for financing Britain's government expenditures.

This institutional innovation of a free trade regime in Britain served as a model for other countries where leading politicians, scholars and ordinary people as well demanded the same trade policy Britain pursued. The most important extension of the British free trade regime was the conclusion of the Cobden-Chevalier-Treaty between France and Britain, in 1860. It marked the beginning of a free trade area in Europe. Through the most-favoured-nation-clause bilateral agreements actually created

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<sup>10)</sup> In this respect McCloskey's interpretation misses the point. See McCloskey, 1980.

<sup>11)</sup> The threshold allowing imports in depended on a moving average of domestic price quotations, see Barnes, 1965; Fairlie, 1965.

<sup>12)</sup> See the overview by van Zanden, 1991. Only Denmark had surpassed Great Britain.

a multilateral free trade area.

The UK stuck to a free trade regime hard and fast until the first world war, and less strictly so until 1932. Attempts to create an Imperial Preference Zone with protective tariffs against e.g. Germany or the US had no chance until 1914.<sup>13</sup>

The transition of British foreign trade policy towards a free trade regime was essential for globalising and intensifying economic relations among nations. This process might have been initiated earlier than by the crucial steps actually taken in 1842 (income tax), 1846 (repeal of the corn laws) and 1860 (Cobden-Chevalier-Treaty). But an earlier introduction of free trade had been limited by fiscal considerations and had been retarded by landowners.

The French movement to free trade differs considerably from the British way.<sup>14)</sup> Both countries, however, converged with their foreign trade policies culminating in the already mentioned Cobden-Chevalier-Treaty, in 1860. Not before 1790 had France formed a customs union with all internal tariff barriers abolished. During the French war against the UK, Napoleon finally introduced the notorious continental system designed to block any foreign trade of continental Europe with the UK.<sup>15)</sup> After the defeat of Napoleon and the opening of French borders to British goods in 1814/15, the French government reintroduced the rather liberal tariff system of 1791. This tariff regime formed a strong incentive for import substitution as it levied no or rather low duties on raw materials, whereas intermediate and finished goods bore increasing taxes amounting to between 5 and 15 percent of the value. Obviously, the isolation from Britain during the previous two decades had led French policy-makers to a misconception about the development the British industrial revolution had brought about. Immediately after the abolition of the import barriers, the highly productive and competitive British industry flooded the French domestic markets with her products, such as cotton textiles and iron products. This caused severe difficulties if not the break-down of those hot house industries which had been established in France and also in other parts of the continent during the years of isolation from Britain and high war-time demand.

In order to defend her industry from these huge British exports France built up a completely prohibitive tariff system against British industrial products, between 1816 and 1822.<sup>16)</sup> As against

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<sup>13</sup> See Marrison, 1996.

<sup>14)</sup> For details see Amé, 1876 and Levasseur, 1912.

<sup>15)</sup> Technically, the system was not perfect because it was counteracted by smuggling and roundabout traffic. Even more importantly, after 1810, the French government granted special licences to traders with Britain. This was of course merely done in order to increase revenues which had dropped dramatically with the continental system between 1806 and 1809. See Heckscher, 1922, pp. 213 ff.

<sup>16)</sup> The set-up of specific import duties was very simple and straight forward: The price of British bar iron in

that non-prohibitive duties on colonial products and raw materials generated some revenues for the state budget. Around 1848, the average French import duty of 20 percent of the value seemed low, compared with British levels in force until the early 1840s, though. This measurement of protection is misleading, however, when in a overwhelmingly prohibitive system most finished products are kept out and thus do not generate any revenue at all.

Of course the high tariff walls in France met with some resistance as they made the internal price level for certain goods rise far above world market levels. As a consequence, the construction of e.g. railways from the 1830s onwards became highly expensive. Even when French iron mills were able to roll rails the protected price level hardly decreased.<sup>17)</sup> As iron served as a major input to industrial goods of various kinds duties on iron became the symbol and the very essence of industrial protection. Similarly, laws issued from 1819 to 1821 introduced a prohibitive protection for agriculture. In order to compensate exporters of goods an increasingly complicated system of rebates and export subsidies emerged. Accordingly, the producers of woollen cloth could agree on an import duty for their raw input. If those traders then traceably exported a finished product made from imported raw material which bore a duty they were granted rebates. The principle of "identity" underlying this regime of "temporary imports" was violated more and more, though. Sugar exports may serve as a prominent example for such a violation: Refining sugar from colonial sugar cane was in accordance with this principle paying a rebate. In the case of refining sugar from domestic beets, the rebates turned into an export subsidy, which in the long run created strong incentives to overexpand the domestic beet sugar industry.<sup>18)</sup>

Since 1830, the July Monarchy put in some moderations of import duties but it was not before the authoritarian regime of Napoleon III (elected in 1848, coup d'état in 1851, emperor from 1852 on) that the French foreign trade regime changed fundamentally. During the 1850s, import duties on raw materials and intermediate goods were lowered significantly (1853/54) and the prohibition of importing machinery and tools was repealed (1855). Moreover, most of the export duties disappeared and the navigation laws were moderated. Increasing prices for food stuffs in 1853/54 were the occasion to lower the import duties on agricultural products significantly. Furthermore, the regime of "temporary imports" and the associated rebates were used to undermine the tariff system. The principle of "identity" was changed into the principle of "equivalence". E.g. an exporter of a

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a French port at the channel was compared with a comparable quality of French iron at the same location. The difference plus a small additional amount was levied on British bar iron (120 percent) as import duty. See Fremdling, 1986, pp. 52-59.

<sup>17)</sup> Fremdling, 1986, pp. 265-307.

<sup>18)</sup> At the end of the 19th century, this policy, not pursued by France alone, had led to a distortion on world markets comparable to the export policy of the European Economic Community in the 1970s and 1980s. The Brussel's convention of 1902 stopped the subsidies on sugar exports. See Paasche, 1911, pp. 1065-1084, in



sailing ship with an iron vessel got a certificate (aquit-à-caution) for a duty-free importation of the iron embodied in the ship. This is to say, iron at a lower stage of production, in the form of pig, bar or plate iron. A market for these certificates developed, where factory owners in the north of France bought certificates in order to import duty free iron from Britain or Belgium. By this the tariff structure was undermined considerably. The conclusion of the Cobden-Chevalier-Treaty with the United Kingdom in 1860 was the climax of Napoleon's efforts to abandon the French prohibitively protectionistic tariff system. It was no sudden event, however, and in the first instance the treaty did not mean the introduction of a completely free trade in France as it was the case in Britain. But for a transitional period, a regime of moderately protectionistic tariffs was installed as a step forward to move to a liberal regime.

The third example of a trade policy which converged towards a free trade regime concerns Prussia-Germany. For the trade policy pursued by the Zollverein and later by the German Empire the Prussian regime was crucial.<sup>19)</sup> At the beginning of the 19th century, the Junker possessed the power in Prussia. The technocrats in the administration, the civil service, also came from this group of landed aristocracy. The Junker opted for free trade because they were grain exporters who wanted to export to Great Britain as well. The industrialists always advocated protection, but in the early decades of the nineteenth century, they hardly had the power to enforce substantial protectionistic measures. After the defeat by the armies of Napoleon, the Prussian state desperately tried to reform its constitutional and institutional framework. Part of the reforms was a new fiscal system and thus a change in the tariff regime.

With the introduction of the new trade regime in 1818, Prussia for the first time collected duties at the political frontiers rather than doing this at bridges crossing a river, at the ports of cities or on toll roads. Compared to the United Kingdom and France at that time the tariffs levied were rather liberal: Raw material bore no duties at all, intermediate products just moderate ones and finished goods a maximum of 10 percent of the value. For fiscal reasons, luxury and colonial products were taxed at 30 percent. Right from the beginning, however, these principles were violated in so far as fiscal considerations dominated the foreign trade regime pursued.<sup>20)</sup>

In 1818, Prussia had no clear-cut concept of a customs union with other German states. The petty and medium-sized states in the vicinity, however, came under pressure to join because their exports to Prussia were taxed by that time and high transit duties through Prussia made imports more

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particular p. 1077.

<sup>19)</sup> For an overview, see Hahn, 1984.

<sup>20)</sup> This principle was also violated in so far as for the sake of simplicity the ad valorem duty was fixed for a certain weight of the taxed good. With declining prices of industrial products in the long run, the actual ad valorem level increased. See Onishi, 1973.

expensive. In the 1820s, the medium-sized German states made several attempts to create an alternative customs union in the middle of Germany. But all efforts finally failed. Instead, the union between small Hesse-Darmstadt and Prussia in 1828 served as a model for the creation of the Zollverein in 1834. Most of the states in the south and the middle of Germany joined this union. In the north, Hanover and Oldenburg followed in 1854 and Mecklenburg/Lübeck in 1868. The Zollverein created an internally free trade area with a moderate protection against the first industrial nation and her exports. Thereby the tariff structure favoured or facilitated a process of import substitution of British finished products (e.g. cotton cloth, steam engines, rails).<sup>21)</sup> As soon as 1840, the Briton Bowring reported that the Zollverein increasingly imported intermediate products (e.g. cotton yarn, pig iron) which had been produced by the superior British industry and were then worked up to finished products by German industrial enterprises.<sup>22)</sup> The gains from intensified trade within the Zollverein of course helped to strengthen the ties among the member countries.<sup>23)</sup> The contract among them had to be renewed every 12 years. It seems pretty clear that for fiscal reasons the petty and medium-sized states did not dare to leave the Zollverein. The revenues were allocated according to the size of the population in the member countries. Prussia had the highest costs of collecting these duties (length of the frontier) and the lowest population density. Thus middle and southern German states profited more from the revenues than Prussia. On the other hand, in the case of conflicts among the members, Prussia prevailed. Although every member country could veto any decision the mere threat of leaving the Zollverein helped Prussia fight her way: By this means, Prussia forged ahead with her aim to move to a free trade policy. In the aftermath of the Cobden-Chevalier-Treaty of 1860, Prussia concluded a similar treaty with France in 1862, which the other Zollverein states had to accept.<sup>24)</sup> Successively until 1873, when the German Empire already had taken over the function of the Zollverein, Germany became part of the free trade area of the European core countries.<sup>25)</sup>

The period of completely free trade in Europe seems to be a short-lived episode, as only the United Kingdom, Denmark and the Netherlands stuck to it unswervingly until 1913. Increasingly from the 1870s onwards, however, Europe was "invadet" by cheap grain from overseas. To fight back against

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<sup>21)</sup> See Fremdling, 1986, pp. 307 ff.

<sup>22)</sup> Bowring, 1840, p. 435.

<sup>23)</sup> Dumke, 1979.

<sup>24)</sup> Böhme, 1966, pp. 91 ff.

<sup>25)</sup> The Cobden-Chevalier-area was joined by Belgium (1862), Prussia/Zollverein (1862), Italy (1863), Switzerland (1864), Sweden (1865), Norway (1865), Spain (1865), the Netherlands (1865).

this "invasion"<sup>26)</sup> from across the Atlantic in core countries as Germany, the notorious coalition of rye and iron (1879) led to the reintroduction of industrial protection and increasingly to import duties for agricultural products. From the 1880s onwards, France in a similar way returned more and more to protective measures both for industry and agriculture.<sup>27)</sup> In both Germany and France, import duties on wheat reached nearly 40 percent of the value shortly before World War I but industrial tariffs made up just 13 or 20 percent.<sup>28)</sup>

In spite of these draw-backs, until 1913, the institutional arrangements in international trade, money, finance and migration remained favourable for the emergence of a globalised world economy. The gold standard with the pound sterling as key currency provided stable exchange rates for the core countries, investment capital could freely cross borders all over the world, migration of people within Europe was far less restricted than it is today and migration from Europe to all the overseas countries of European settlement was free. Furthermore, decisive for a globalisation was the reduction of national and international transportation costs. This dramatic decline of "natural" protection was in itself a major cause for several European countries to return to a moderate "artificial" protection. The freight rate reductions, however, went far beyond a compensation for the recurrently introduced tariffs on bulky commodities such as grain.<sup>29)</sup>

#### The Development of Freight Rates and the World Market for Grain and Hard Coal

The decline of the freight rates mainly during the second part of the 19th century, was due to several reasons. In particular, the application of the steam engine to both sea going vessels and boats for inland navigation, the innovation of the locomotive and the coming of the railway. But there were also numerous improvements of modern and even traditional means of transport. Modern iron steamers had been in use for decades, but less economically than sailing vessels. Steamers lagged behind because for a long time they had to rely on steam engines which consumed a considerable amount of coal. This had two disadvantages: first, the running costs were high and second, the coal bunkered aboard closely limited the capacity of the shipload. Not before the 1860s did the compound engine (later the triple-expansion engine and further improvements) become standard equipment of steamships. These fuel-saving devices reduced the consumption of coal considerably. Harley shows that in 1855 five pounds of coal were necessary to generate one horsepower for one

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<sup>26)</sup> O'Rourke, 1997.

<sup>27)</sup> See the details in Fremdling, 1988.

<sup>28)</sup> O'Rourke, 1997, p. 783; Pollard, 1981, p. 259.

<sup>29)</sup> As against the late 1860s, it cost 55 cents less to ship a bushel of wheat from Chicago to Liverpool shortly before World War I. For the same quantity of wheat Germany and France, in 1907, levied 35,6 cents

hour and in 1890 less than two pounds sufficed to generate the same power.<sup>30)</sup> The fuel-saving effect directly lowered the running costs and indirectly increased the freight-earning capacity, which was further enlarged through the smaller dimensions of the improved steam engines. Long distance trade over land, on inland waterways or over the oceans was no new phenomenon, to be sure. New, however, was the fact that bulky commodities, namely goods with a rather low value compared to their weight, could be traded on a world wide scale. Here I concentrate on grain and hard coal which, together with raw cotton, had become the most important commodities in international trade, around 1900.<sup>31)</sup>

Table 2 gives an account of the declining rates of grain shipment between Chicago and Liverpool. All three modern modes of transportation were involved for shipping grain from the American mid-west to the United Kingdom. Freight rate quotations are given for every year between 1868 to 1902. Although there are some fluctuations, the trend emerges very clearly. If we put the level of 1902 at 100 the rates for transportation from Chicago to New York declined from 360/351 in 1868 to 100. The decline was even more pronounced for the further transportation from New York to Liverpool with rates dropping from 487 to 100. In the first instance, it is remarkable that grain from America and from other remote areas reached the British market altogether and thus supplied the British people with cheap food stuff.

The globalisation of the grain market had severe repercussions on the European agriculture, though. The grain prices in Britain as shown in Table 2 fell less dramatically than freight rates, declining from somewhat above 200 to 100 in 1902. However, only by less than one third can this decrease be attributed to the declining freight rates. That is to say, European grain producers not only faced overseas competition due to falling freight rates but also because productivity gains and decreasing prices of grain were passed to Europe and enforced adaptations there.<sup>32)</sup> In principle, European countries and indigenous peasants reacted in two ways: Some countries, as France and Germany, adopted protectionistic measures to cushion overseas competition. In other countries, as the United Kingdom, the Netherlands and Denmark, farmers switched from growing grain to breeding cattle and to dairing.<sup>33)</sup>

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and 38,6 cents respectively as import duties. See Harley, 1980, p. 222.

<sup>30)</sup> Harley, 1971, p. 220 and Harley, 1988.

<sup>31)</sup> Lamartine Yates, 1959, p. 150.

<sup>32)</sup> O'Rourke and Williamson also put forth that "declining transport costs on their own would have led to a decline in British wheat prices of between 15 and 25 percent." The larger price decline reflects according to them "... not only market integration but also agricultural supply shifts in the U. S. and elsewhere." A specific explanation is unfortunately not given. See O'Rourke, 1997, p.784 f. and O'Rourke and Williamson, 1994.

<sup>33)</sup> Van Zanden, 1991. By turning to protection, the agricultural population both in Germany and France were kept high in the long run. This partly explains the agricultural policy of the European Economic Community in the 1960s.

The effects of increasingly overlapping markets and of the changing trade policies and transportation costs in particular can be observed by looking at the price movement at different key locations of the world market. The Statistische Reichsamt produced several graphs on grain market prices in the long run.<sup>34)</sup> I reproduced the graphs for wheat with prices for London (the world market), Berlin, Chicago and Buenos Aires. During the British war with France, prices in London were considerably higher than in Berlin (forming the centre of a grain exporting country). The fact that they remained higher even in peace time was due to the corn laws. The repeal of these in laws in the 1840s, brought the prices in London much closer to the still lower quotations in Berlin. With the entrance of America's mid-west into the world market for grain the Chicago price and the decreasing freight rates forced the price of wheat in London down dramatically until around 1900. After 1879, when Germany introduced import duties on grain, the Berlin wheat price rose even above the price in London. After 1900, also Argentina entered the world market with prices close to the Chicago ones.

The second important bulky commodity to be increasingly traded internationally was hard coal. This subject is dealt with by putting it into the British perspective. Furthermore, it is restricted to the time from 1853 to 1913 for which I compiled detailed statistics on British coal exports. During this period, import or export duties on coal played a minor role. Closely associated with the technologies of the first round of industrialisation, the demand for hard coal augmented.

During the 19th century, Britain's coal exports<sup>35)</sup> grew at a faster rate than her coal output. According to the estimate by Church, British output increased from 63.5 million tons<sup>36)</sup> of coal in 1850 to 292.1 million tons in 1913.<sup>37)</sup> During the same years, exports first comprised little more than 4 million tons and finally nearly 100 million tons.<sup>38)</sup> Whereas in 1855, exports (7.5 percent) had clearly stayed behind the two most important indigenous consumers of coal, namely the iron and steel industry (24.9 percent) and domestic fuel (20.9 percent), in 1913, exports outstripped both of them, holding 34.1 percent as against 11.6 percent and 12.2 percent respectively.<sup>39)</sup> Coal exports also contributed overproportionally to the growth of the entire British foreign trade. In the total domestic

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<sup>34)</sup> Getreidepreise, 1935; see also O'Rourke, 1997, p. 782 and Harley, 1980, p. 219.

<sup>35)</sup> As far as I know there is no monograph on this subject. Besides small chapters within books on British coal mining in general see the articles by Palmer, 1970; Harley, 1989, and the older studies by Thomas, 1903; Jevons, 1909 and Zimmermann, 1911.

<sup>36)</sup> If not mentioned otherwise I use metric measures.

<sup>37)</sup> These and the following figures are taken from Church, 1986, pp. 19, 32, 86.

<sup>38)</sup> Coke and patent fuel are converted into coal equivalents and are included here. Bunker coal for foreign vessels in Britain and bunker coal for British vessels at foreign bunker stations are also counted as exports.

<sup>39)</sup> Slightly different figures but with the same tendency as given by Church are to be found in Mitchell, 1984, p. 12.

export value, coal had comprised just 1.8 percent in 1850, but increased to 10.2 percent in 1913.<sup>40)</sup> A major cause for the enormous growth of British coal exports lay in decreasing ocean freight rates. Many British coal districts were located along the coast or were at least connected with ports through short distance railways.<sup>41)</sup>

Harley systematically compiled freight rates of coal shipment covering a longer period. Some of his data are shown in Table 3. In addition, I computed freight rates from figures collected by Thomas and Jevons (Table 4). Starting before the technically far reaching changes in ocean shipping gained momentum, Harley's data thus include the decisive transition from the wooden sailing vessel to the iron steamer. He registers no falling trend in the overall level of freight rates for coal before the 1860s. Thereafter, the rates declined dramatically until the early 1890s, in subsequent years they fell rather moderately and shortly before World War I, they increased again.<sup>42)</sup> In Table 4 the freight rates are taken up only during their downward trend and since then they support Harley's findings.<sup>43)</sup> The development of coal freight rates during the 19th century differs from North's statement that general ocean freight rates already showed a downward trend in the first half of the 19th century.<sup>44)</sup>

As mentioned before the steep fall in ocean freight rates from the 1860s was due to innovations which improved the economic performance of steamers.<sup>45)</sup> The steamship itself was decisive in increasing British coal exports. Through forward linkage effects, i.e. decreasing freight rates (caused by the very steamship), the sale of British coal was promoted on foreign markets. To reach these markets powerful backward linkage effects were induced, as this means of transportation itself consumed coal. In 1905, about 17 million tons of coal were bunkered in British ports. And a contemporary maintained before the Coal Supply Commission that in the same year at least 5 million tons of coal were shipped to foreign bunker stations.<sup>46)</sup> This means that nearly one third of the coal leaving Great Britain on sea was used for running sea shipment.<sup>47)</sup> In any case it might be stated that the tendency towards downward and finally low freight rates made British coal more and more

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<sup>40)</sup> Based on the figures in Mitchell/Deane, 1962, p. 283 f., 303, 305. Bunker coal for foreign vessels in British ports is not included. In 1913 this comprised 25% of the remaining exports of coal after all.

<sup>41)</sup> See the map in Church, 1986, p. XXI.

<sup>42)</sup> Harley, 1989, p. 315 ff.

<sup>43)</sup> See also Jevons (1915, p. 692 f.), who compiled data for eight ports from 1863/65 up to 1913 (yearly data without gaps from 1886 onwards). They also reveal the described trend.

<sup>44)</sup> See also Harley, 1988 and North, 1971, pp. 163-174.

<sup>45)</sup> Only a few aspects of technological improvements are sketched here. For more information see Dyos/Aldcroft, 1969, pp. 254 ff.; Harley, 1971, pp. 216 ff.; Ville, 1990, pp. 49 ff.

<sup>46)</sup> Church, 1986, p. 34.

<sup>47)</sup> In 1905 hard coal exports (without coke, patent fuel, bunkers) were about 48 million tons. Source: see Table 5). Thomas even estimated that this share was more than 50%. Thomas, 1903, p. 469; see also Palmer, 1970, p. 337 ff.

competitive on foreign markets. In particular so since (disregarding cyclical fluctuations) British coal prices at the pit mouth rather stagnated from the 1850s to the 1880s and increased<sup>48)</sup> even thereafter.

How were the British coal exports distributed among the receiving countries or regions? To my knowledge, the secondary literature deals with this subject in a rather crude manner.<sup>49)</sup> Therefore basic data had to be compiled making fundamental use of the British foreign trade statistics. I assembled yearly data on the British coal export for each destination, disregarding both the figures on patent fuel and on bunkers for foreign vessels in Britain. The regional distribution of exports is determined by the receiving port. Table 5 shows the already mentioned dominance of European customers. Between 1853 and 1913, this preponderance even increased: Initially the European share made up about 70 percent. During the 1870s and around 1900, it took two further upward batches of 5 percentage points. Finally Europe got about 80 percent of all British coal exports. Outside of Europe, large amounts were sent to Egypt, which was due to the opening of the Suez-Canal in 1869. This canal helped to diffuse the innovation of steamships to the Far East.<sup>50)</sup> It seems likely that coal exports to the rest of Africa mainly served to supply bunker stations. Initially, i.e. in 1853/57, Turkey was an important customer, but the then decreasing export shares seem to indicate an economic stagnation in this area. India took a high level until the 1880s, but like the rest of Africa, it received rather modest shares in the following decades. The local demand was increasingly met by supplies of newly explored coal mines in the regions themselves. The same applies to South Africa and Australia.<sup>51)</sup> Until the 1860s, the shares of North America are surprisingly high, but through improved transportation systems there the wealthy indigenous coal resources could soon better be distributed to other North American regions. As in Latin America, rich coal basins had not been explored or exploited before World War I and British coal could then gain important sales in spite of high transportation costs.<sup>52)</sup>

The significance of particular countries in Europe and the shifting export ratios over time actually require a differentiated analysis. One might expect countries poorly endowed with coal resources but blessed with a long coast line to have offered an ideal sales market for British coal. Denmark, with

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<sup>48)</sup> See the graph in Church, 1986, p. 53. A similar tendency occurred in Ruhr coal mining, see Holtfrerich, 1973 p. 20.

<sup>49)</sup> See, however, Harley 1989. He compiled yearly data between 1850 and 1993, broken down to only seven destinations, i.e. the major shipping routes.

<sup>50)</sup> See Farnie, 1969, pass.; Harley, 1971, pp. 223 ff.

<sup>51)</sup> See Jevons, 1915, pp. 783 ff.; Hassel, 1905, pp. 175 ff.; Zimmermann, 1911, p. 1150; Palmer, 1970, p. 339.

<sup>52)</sup> Jevons, 1915, pp. 782 f.; Hassel, 1905, pp. 36 ff.

her constantly high shares, lends strong support to this. But the shares of Sweden/Norway and above all Italy jumped too high to be fully explained by this hypothesis. The demand for coal depended on the stage of development, i.e. the timing of entering into industrialisation, which mainly was characterised by applying coal consuming techniques. Hence the shares of British coal exports to the various European countries shifted considerably.<sup>53)</sup> France was the most important customer of British coal exports. The vicinity of channel and other Atlantic ports offered cheap transport. This explains why large regions in France preferred British coal to coal from the north of France or Belgium. In the Netherlands the market shares of coal imports were determined by mainly changing transportation costs among different modes of transportation. The high Russian and the huge German shares point to a further factor of influence. Both Russia and Germany possessed enormous indigenous coal resources. But for a long time it was cheaper for locations near the coast to import British coal than to rely on domestic supplies. So these British sales were protected against domestic competition by high costs for overland transportation. Until World War I, British coal remained competitive in coastal markets in spite of the then decreasing railway freight rates.<sup>54)</sup>

### Conclusion

These historical precedents to global markets for grain and coal cannot be attributed to technological improvements simply and solely. But the technical break-through in transportation was essential for lowering transport cost, indeed. Only then could bulky commodities be shipped to distant and overlapping markets of different competing suppliers of these goods. Equally important, however, were political decisions to abolish or at least reduce the existing artificial trade barriers. Otherwise it would be difficult to explain why for decades in the 20th century the world economy in fact had deglobalized.

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<sup>53)</sup> Alternative domestic sources of energy should also be considered, e.g. the richness in wood in the case of Sweden. See Hassel, 1905, pp. 122 ff.

<sup>54)</sup> France, the Netherlands and Germany are dealt with in detail in Fremdling, 1996.



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Table 1. World Trade and its Distribution by Countries and Regions, 1820-1913, volume index and percentages

Year	1820	1850	1870	1880	1913
Volume index 1913 = 100	3.1	10.1	23.8	33.5	100
Great Britain	27	22	25	23	16
France	9	11	10	11	7
Germany	11	8	10	10	12
Switzerland	2	2	2	2	2
Netherlands/ Belgium	6	7	6	8	7
Scandinavia	2	2	2	2	3
Italy	4	5	3	3	3
Western Europe	61	57	58	59	50
Total Europe	76	69	72	71	64
North America	-	-	-	-	14
of which United States	6	7	8	10	11
Latin America	8	8	6	5	8
Asia	-	-	-	-	9
of which India	3	4	4	4	-
Africa	-		-	-	4
Various <sup>a</sup>	8	11	11	11	2

a) mainly British colonies

Source: Based on the compilation of W.W. Rostow, *The World Economy*, Austin 1978, pp. 71 f..





Table 2.

## The Influence of Freight Rates on Grain Prices

Year	Average Price of Wheat Per Quarter (=12.7 kg)				Freight Rates From Chicago to New York				From New York to Liverpool	
	British Weat (according to official quotations)		From Atlantic ports imported wheat from the United States (declared value)		On water and rail per quarter		On rail alone per quarter		With the steamship per quarter	
	s	d	s	d	s	d	s	d	s	d
1868	63	9	57	11	6	11	10	2	4	7½
1869	48	2	43	8	6	3	8	9½	4	5½
1870	46	11	44	4	6	4½	9	8	3	11
1871	56	8	51	7a)	7	5½	9	3	5	6
1872	57	0	55	10a)	8	3½	9	11	5	2
1873	58	8	56	0a)	7	10½	9	8½	7	0½
1874	55	9	52	9a)	5	1	8	7	5	10½
1875	45	2	45	5a)	4	3	7	0	5	7½
1876	46	2	44	4	3	6½	4	11	5	4
1877	56	9	53	5	5	0½	6	5½	4	8
1878	46	5	47	10	3	9	5	10	5	1
1879	43	10	45	8	4	5	5	9	4	1½
1880	44	4	47	4	5	3	6	7½	3	10½
1881	45	4	47	6	3	5½	4	9½	2	9
1882	45	1	46	0	3	7½	4	10½	2	7½
1883	41	7	43	5	3	10	5	6	2	10½
1884	35	8	37	1	3	4	4	4½	2	4
1885	32	10	35	0	3	0	4	8	2	1½
1886	31	0	33	3	4	0	5	6	2	2½
1887	32	6	33	3	4	0	5	3	1	8
1888	31	10	33	2	3	8	4	10	1	9
1889	29	9	32	9	2	11	5	0	2	7½
1890	31	11	34	4	2	10	4	9	1	7½
1891	37	0	39	1	2	10	5	0	2	1
1892	30	3	33	1	2	6	4	9	1	9
1893	26	4	27	10	2	10	4	11	1	7
1894	22	10	23	8	2	4	4	3½	1	3½
1895	23	1	24	5	2	4	4	0½	1	8½
1896	26	2	27	2	2	5½	4	0	1	11½
1897	30	2	33	0	2	5½	4	1½	2	0½
1898	34	0	34	7	3	2	3	10	2	3½
1899	25	8	29	4	2	2½	3	8½	1	7½
1900	26	11	29	9	1	8	3	0½	2	3
1901	26	9	28	6	1	10½	3	0	0	10
1902	28	1	28	5	1	11	2	11	0	11½

a) Including ports of the pacific

Source: L. Brentano, Die deutschen Getreidezölle, 2e edition, Stuttgart 1911, p. 84, 85

Table 3. Freight Rates for Coal Shipments from Britain<sup>1</sup>, 1850-1913, in shillings per ton

Year	to Hamburg/Le Havre	to Danzig	to Bordeaux	to Genoa	to South-America
1850/54	9.7	10.3	11.8	19.4-	
1855/59	10.0	11.7	14.7	26.652.0	
1860/64	9.2	10.3	14.0	23.636.8	
1865/69	8.3	9.3	12.6	19.532.6	
1870/74	8.7	9.2	10.5	17.230.0	
1875/79	7.3	9.1	9.3	13.923.4	
1880/84	6.3	8.3	7.8	12.823.3	
1885/89	4.8	5.9	6.4	10.322.4	
1890/94	4.7	4.8	4.8	7.516.8	
1895/99	4.4	4.4	4.6	8.013.8	
1900/04	4.3	4.8	4.3	7.011.8	
1905/09	3.8	4.4	4.1	6.511.2	
1910/13	4.3	5.4	5.3	8.817.1	

Source: Calculated from Harley 1989: 334-336

<sup>1</sup> Various ports

Table 4. Freight Rates for Coal Shipments from Cardiff to Various Ports, 1872-1909/11, in shillings per ton and per 100 kilometres

Ports of Destination		1872	1873	1875	1888	1890	1892	1893	1898	1900	1901	1902	1905/07	1909/11
Group 1: Mediterranean and European Atlantic	0.58	0.67	0.55	0.39	0.36	0.33	0.28	0.36	0.40	0.28	0.25	0.24	0.26	
Group 2: Baltic and North Sea		0.57	0.69	0.62	0.42	0.43	0.27	0.23	0.39	0.40	0.28	0.26	0.25	0.22
Group 3: East African	0.33	0.38	0.30	0.26	0.19	0.13	0.12	0.15	0.23	0.15	0.12	0.11	0.10	
Group 4: West African	0.36	0.44	0.37	0.25	0.17	0.25	0.33	0.36	0.16					
Group 5: South African	0.19	0.27	0.21	0.31	0.12	0.20	0.25	0.18	0.14	0.11				
Group 6: Continental Indian		0.23	0.27	0.19	0.19	0.13	0.09	0.08	0.12	0.18	0.11	0.09	0.09	0.08
Group 7: Asian Far Eastern		0.20	0.21	0.17	0.16	0.13	0.09	0.08	0.13	0.16	0.11	0.08	0.08	0.06
Group 8: South American Atlantic	0.27	0.35	0.23	0.32	0.26	0.13	0.10	0.15	0.16	0.12	0.10	0.12	0.13	
Group 9: West Indian	0.25	0.26	0.17	0.20	0.14	0.10	0.10	0.13	0.19	0.11	0.11	0.12	0.11	
Group 10: American Pacific		0.18	0.19	0.12						0.08	0.08	0.06	0.11	0.09
Total Average		0.53	0.62	0.53	0.38	0.34	0.27	0.23	0.34	0.37	0.26	0.23	0.22	0.22

Sources and notes on Table A1: 1872-1902, Thomas 1903: 505 ff.; 1905/07, Jevons 1909: 13; 1909/11, Jevons 1915: 685 f.

The freight rates are standardized per 100 kilometre. For each group there are unweighted averages given, and the total average is weighted by the shipped quantities in 1902. For the quantities see Thomas, Growth, p. 510.

Name of the ports (Distance from Cardiff in nautical miles):

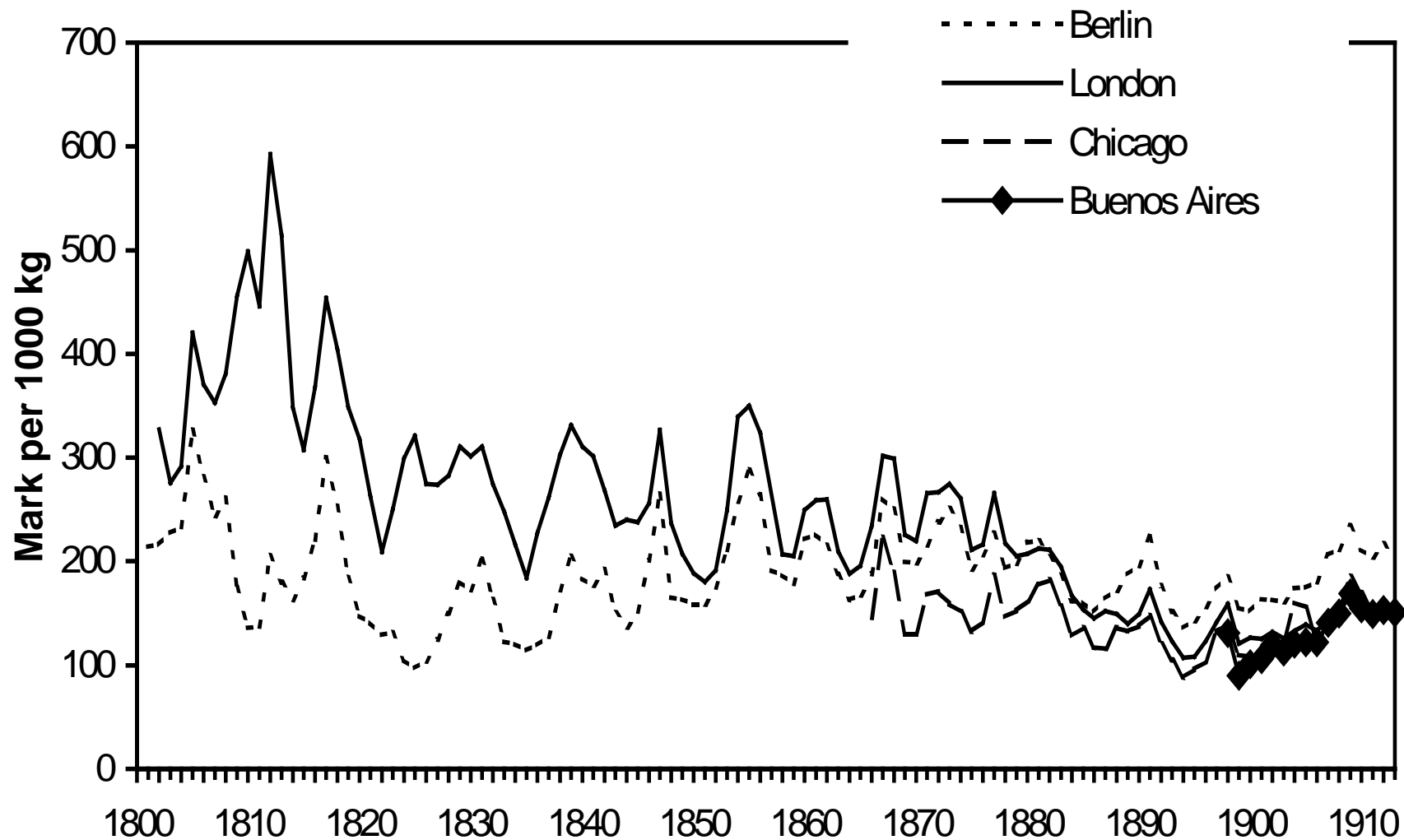
- Group 1 : Alexandria (2,943), Barcelona (1,664), Bilbao (560), Bordeaux (542), Cape de Verdes (2,408), Dieppe (417), Genoa (2,020), Gibraltar (1,153), Havre (382), Lisbon (882), Malta (2,133), Marseilles (1,844), Odessa (3,272), Piraeus (2,616), Port Said (3,072), Rouen (420), Trieste (2,806), Venice (2,800).
- Group 2 : Antwerp (558), Cronstadt (1,776), Hamburg (821), Stockholm (1,498).
- Group 3 : Aden (4,489).
- Group 4 : Sierra Leone (2,885).
- Group 5 : Cape Town (5,998).
- Group 6 : Bombay (6,154).
- Group 7 : Colombo (6,606), Hong Kong (9,716), Shanghai (10,466), Singapore (8,186), Yokohama (11,094).
- Group 8 : Buenos Ayres (6,249), Monte Video (6,139), Rio Janeiro (5,027).
- Group 9 : Havanna (4,025), Jamaica (4,034), St. Thomas (3,525).
- Group 10 : Iquique - via Cape Horn (9,623), Iquique - via Isthmus (6,830), San Francisco - via Cape Horn (13,606), San Francisco - via Isthmus (8,175), Valparaiso - via Cape Horn (8,869), Valparaiso - via Isthmus (7,588).

Table 5. British Exports of Hard Coal, 1853-1913, five years averages in per cent

Country/Region	1853-57	1858-62	1863-67	1868-72	1873-77	1878-82	1883-87	1888-92	1893-97	1898-02	1903-07	1908-12/13
Russia	3.1	5.0	5.6	6.5	6.3	7.5	6.1	5.3	5.5	6.4	5.2	6.0
Sweden/Norway	4.2	4.4	4.5	5.2	7.1	7.0	7.4	8.0	9.1	10.0	9.4	9.5
Denmark	7.9	6.5	5.8	5.6	5.0	4.9	5.0	4.8	5.0	5.0	4.8	4.5
Germany	15.5	15.7	14.5	15.2	14.3	12.0	11.6	12.5	13.2	13.3	14.7	14.0
Netherlands	3.9	3.9	2.6	3.3	3.2	2.5	1.5	1.7	1.8	2.8	3.8	3.3
Belgium	0.4	0.7	0.7	1.0	2.0	1.4	1.3	1.5	1.0	1.7	1.9	2.6
France	19.7	19.3	18.3	17.8	19.1	19.6	18.5	16.5	15.8	17.3	15.7	16.3
Portugal/Azores/ Madeira	1.8	1.5	1.7	1.6	1.8	1.8	1.8	2.0	1.9	1.9	1.9	1.8
Spain/Canary Islands	3.6	5.2	4.9	4.0	4.0	4.3	4.8	5.6	5.8	5.2	4.8	4.6
Italy	2.4	4.2	5.8	6.0	6.9	8.2	11.1	12.2	13.0	12.7	13.6	14.0
Austria	1.4	1.3	0.7	0.3	0.5	0.3	0.3	0.3	0.6	0.5	1.2	1.5
Rest of Europe	6.3	4.6	4.3	3.3	4.0	5.6	5.9	5.2	4.3	3.5	3.0	3.0
Europe	70.2	72.5	69.6	69.7	74.3	75.0	75.3	75.8	76.9	80.4	80.0	81.0
Egypt	1.2	1.4	3.4	3.6	3.9	3.8	4.9	5.4	5.1	4.8	4.7	4.3
Rest of Africa	1.1	0.8	1.5	0.1	0.6	2.1	2.1	2.7	3.2	3.7	3.1	2.7
Turkey	5.1	2.6	2.1	2.3	1.8	1.6	1.5	1.5	1.5	1.0	0.9	0.7
India	3.2	3.0	4.5	3.9	4.8	5.1	5.4	4.3	3.2	1.5	1.1	0.8
Rest of Asia	1.7	2.1	2.6	1.1	1.7	1.7	1.4	1.2	1.1	1.0	1.1	0.5
USA	3.8	4.2	2.1	1.0	0.7	1.2	1.0	0.7	0.5	0.6	0.6	0
Canada	1.9	2.0	2.0	1.8	1.2	0.9	0.5	0.3	0.3	0.2	0.2	0.1
Central America	4.4	4.2	5.1	3.6	3.1	2.8	1.9	1.5	1.0	0.4	0.5	0.2
Chili	1.0	0.8	1.1	1.0	1.3	1.0	0.6	0.8	0.9	0.7	0.9	1.0
Brasil	1.8	2.0	2.2	2.5	2.5	2.0	2.0	2.4	2.6	2.1	2.1	2.4
La Plata-Region	0.0	0.6	1.2	1.8	1.2	1.3	2.3	3.0	3.4	3.3	4.6	6.0
Rest of South America		0.3	0.2	0.6	0.8	0.8	0.8	0.5	0.3	0.2	0.1	0.1
America	13.2	14.1	14.3	12.5	11.1	10.0	8.9	8.7	8.9	7.4	8.9	9.8
Australia, New Zealand, Pacific Islands	0.9	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Countries	3.5	3.0	1.8	6.8	1.7	0.7	0.6	0.4	0.1	0.0	0.2	0.2
Total (metric tons)	5032045	7261365	9177838	11553735	14226455	17818577	22780126	28534745	32428068	41731913	52404256	66258503

Source: Computed from yearly data in the British foreign trade statistics, see Parliamentary Papers 1854/55 ff.

# Prices of Wheat, 1801-1913 in Mark per 1000 kg



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