
ARTICLES

*Terms of Trade between South Italy and the United Kingdom 1817-1869**

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I. THE PROBLEM AND ITS SETTING.

Investigation of secular movements in international terms of trade is well suited for «new economic history». Well known is the so-called «Prebisch thesis» regarding the detrimental trend in the terms of trade of the less developed countries vis-à-vis the advanced countries. But since many underlying issues have not been resolved, they present a challenge to both the analytically-minded economic historians and the history-sensitive economists.

The forceful arguments of Prebisch, Singer, and a host of other «development economists» seem to contradict the classical position from Torrens through Keynes that the movement of the terms of trade has to be detrimental to the industrial, and beneficial to the

* The writers wish to acknowledge the very helpful assistance of Luigi de Rosa, Shephard Clough, Alexander Gerschenkron, Raymond de Roover, Frank Spooner and Carlo de Cugis. Ira Glazier is indebted to the Fulbright Commission for the opportunity to carry out research in Italy in the spring of 1971 and to the Istituto di Storia Economica, Bocconi University, Milan for generously making available its facilities. Richard Berner has made the study feasible through his work with PINUP. Computations were carried out at the computer centers at the University of Pennsylvania, Temple University, and Boston College.

primary-producing countries.¹ To be sure, deductive models can be constructed to show that the terms can move either way under appropriate assumptions.² Among empirical studies, however, the evidence for Latin America seems to support the Prebisch thesis, while the British experience as interpreted by Imlah and others does not contradict the classical position.³ It is not clear whether these differences are observed because industrialization in the century preceding World War I as seen from the standpoint of advancing England differs from the present «development century» as seen from the standpoint of the lagging Latin American periphery in relation to the North Atlantic «center countries».

Our study turns to computerized analysis of the massive statistical detail on British-Italian trade in hopes of testing and refining inductive hypotheses and deductive models regarding the significance of international price movements in economic development. The present article outlines the methodology of a rather ambitious project on «British-Italian Terms of Trade During a Century of Industrialization (1815-1913)», and presents an installment of empirical results pertaining to Southern Italy in the half-century or so preceding unification. The essential purpose of the project is to interpret the changing structure of trade between the lagging economy of Italy, and the relatively advanced economy of Great Britain during a century of rapid industrialization and its diffusion in Europe. The study will cover British-Italian terms of trade in both the pre-unification (1815-1869) and post-unification periods (1870-1913). Attention is focused on price movements in exports and imports, which movements can be conveniently telescoped into various terms-of-trade (T) indices.

¹ The following provide a background for the Prebisch thesis. H. W. SINGER, *The Distribution of Gains Between Investing and Borrowing Countries*, «American Economic Review» (Proceedings), May 1950; R. PREBISCH, *Commercial Policy in the Underdeveloped Countries*, «American Economic Review» (Proceedings), May 1959; G. L. HYDE, *A Critique of the Prebisch Thesis*, «Economia Internazionale», May 1963. The classical position is reviewed in Bo SÖDERSTEN, *International Economics* (Harper & Row, 1970), pp. 184-90.

² SÖDERSTEN, *op. cit.*, pp. 138-51.

³ See for example, W. BAER, *The Economics of Prebisch and ECLA*, «Economic Development and Cultural Change», January 1962; A. H. IMLAH, *Economic Elements in the Pax Britannica* (Harvard University Press, 1958).

The purpose of these T indices is to determine significant trends as well as the patterns of fluctuation. We intend to interpret the results of the larger study within the framework of two currently significant analytical frameworks, namely, the Prebisch thesis and the theory of economic integration.

The Prebisch thesis claims that the terms of trade turn against the relatively underdeveloped, poor, and small, periphery countries as they confront the progressive, rich, and powerful center countries. Although the thesis has been applied to Latin American countries, the interpretation of the evidence is disputed on theoretical grounds and because statistical results, usually involving short time-series, are questionable. The British-Italian trade study is suitable for the Prebisch framework because Great Britain was an advanced center country buying about 2% of her imports from Italy, while Italy was a lagging periphery selling to Great Britain about 22% of exports. The trading relation between the two countries was subject to technological and demand disturbances similar to those which underlie U.S. trade with the «periphery». On the supply side, Great Britain became a leader in manufactured cottons and other factory-produced «new» products making her an aggressive exporter and import-substituter. Italy, on the other side, developed inelastic and often high demand for industrial products, for example, in conjunction with railroad construction. *A priori*, the Prebisch thesis should be confirmed in this instance. The carefully calculated T indices will afford an interesting test of the thesis in terms of long time-series outside the rather peculiar context of Latin America in this century. Additionally, such long series will make it possible to observe the relevance of forces other than «structural», such as the impact of political unification (1861) on Italian trade and the effects of protectionism in Italy in the 1880's and 1890's.

The second important objective of the study will be an attempt to identify the effects of unification. Here, the analysis will be within the framework of the customs union theory.⁴ The question

⁴ The fundamental works on economics of unification include J. VINER, *The Customs Union Issue* (New York, 1950); J. E. MEADE, *The Theory of Customs Union* (Amsterdam, 1955), and B. BALASSA, *The Theory of Economic Integration* (Richard D. Irwin, 1961).

is how significant was trade diversion and trade creation. We contend that these structural adjustments should be reflected not only in the size, content, and balance of trade, but also in relative prices and, hence, the T indices. To wit, the increased demand in the expanded common market following Italian unification probably tended to push up import prices while the newly-created internal marketing opportunities probably reduced export capacity and, hence, upheld export prices. We expect that the relative importance of these diverse adjustments due to unification « shock » will be reflected in the export-price index, import-price index, and T indices.

Keeping in mind the broad interests of the readers, methodological aspects of the study are reported here in some detail. The empirical evidence for South Italy before unification aims to illustrate the type of results that are being generated by the computer. Although the calculations are valuable in themselves, their more complete evaluation will be made at another time in relation to similar calculations for other Italian provinces in both pre and post-unification periods.

We are fortunate to have Professor Imlah's pathbreaking study on British terms of trade as a model,⁵ as his results can be used as a check and a standard of comparison. To be sure, his indices pertain to the terms of trade of Great Britain vis-à-vis the rest of the world, while our statistics pertain to the two country case, that is, Italian-British trade only. Nonetheless, the price patterns involving British trade with the Italian provinces can be expected to conform to the aggregate British trade indexes.

II. STATISTICAL PROCEDURES.

The need to make the terms-of-trade concept operational requires a brief word concerning the intricacies of index numbers. To begin with, although our study follows Imlah's procedures, we

⁵ IMLAH, *op. cit.*

have far greater flexibility to experiment with a large number of alternative techniques and methods because we have a computer.

Let P stand for prices and Q for quantities of individual exports (x) and imports (m); second subscripts $i=1\dots n$ stand for years, with «o» signifying the base year. We define:

- (a) Volume relative for exports, $V_x = \frac{\sum P_{xo} Q_{xi}}{\sum P_{xo} Q_{xo}}$
- (b) Volume relative for imports, $V_m = \frac{\sum P_{mo} Q_{mi}}{\sum P_{mo} Q_{mo}}$
- (c) The gross barter terms of trade
(a composite of Laspeyres «volume indexes»), $GBT = \frac{\sum P_{xo} Q_{xi}}{\sum P_{xo} Q_{mo}} : \frac{\sum P_{mo} Q_{mi}}{\sum P_{mo} Q_{mo}}$
- (d) The net barter terms of trade
(a composite of Paasche price indexes), $NBT = \frac{\sum P_{xi} Q_{xi}}{\sum P_{xo} Q_{xi}} : \frac{\sum P_{mi} Q_{mi}}{\sum P_{mo} Q_{mi}}$
- (e) Total volume relative, $TV = \frac{\sum P_{xo} Q_{xi}}{\sum P_{xo} Q_{xo}} + \frac{\sum P_{mo} Q_{mi}}{\sum P_{mo} Q_{mo}}$
- (f) Total gain from trade, $TG = TV \times NBT$
- (g) Trade balance, $TB = GBT \times NBT$
- (h) Market gain from trade, $MGT = TV \times TB$

Special statistical procedures have been devised to aid us in the interpretation of the T indices. In selecting meaningful base years, we employ a shifting base year technique, chain indexes, and moving averages as weights. Another difficulty arises as data coverage changes over time so that it becomes necessary to make assumptions about price movements in the «residuals» and to correct the composite indices accordingly. Here the interpretation of the indexes is facilitated by identifying price movements of dominant exports and imports. (See Graphs 3 and 4). Lastly, improvements in the raw price data during the course of research required recalculation of indices. Although we started the study with «official» prices

for British imports, it became evident that to achieve meaningful results we would have to substitute current market prices for the « official » prices of British imports between 1815 and 1853. (See Appendix on Sources and Methods). Computerized analysis offers immense advantages in these statistical operations. Where Professor Imlah needed many years to complete his statistical calculations, we can achieve highly accurate results with PINUP, allowing for limitations of data, in a matter of minutes. The study required a specially written program, PINUP, flexible enough to accomodate all foreseen statistical requirements and to allow experimentation with new ideas during the course of research.

III. COMPUTER METHODS.

PINUP, or Pre-Programmed Index Number Utility Package, is a flexible collection of algorithms designed to handle large quantities of data for the computation of index numbers in the form of matrices or arrays. The salient characteristics of the program, which was patterned after a matrix package written by C. William Benz,⁶ are as follows:

- 1) it interprets and executes user-supplied commands in arbitrary order;
- 2) the flow of computations is determined by these commands, so that the structure of the program is simple;
- 3) more commands can be added easily, or existing commands can be modified.

When the data are stored on tape or disk and properly coded according to the format of the program, the researcher may submit card decks consisting solely of control cards for production runs. All basic matrix operations except inversion are available. These

⁶ BENZ, WILLIAM C., *Passion* (W.H. Freeman Co., 1970).

include matrix addition, subtraction, multiplication, term-by-term multiplication and division, multiplication by a scalar (e.g., the row or column sums), permutation of rows or columns anywhere in a given storage area or into *other* storage areas, and transposition. The storage area concept, also deriving from the Benz package mentioned above, allows the user to allocate from one to nine matrix work areas of varying size via execution-time dimensioning. Hence, if the commodity matrices are sufficiently small, input-output operations can be minimized since most computations may be retained in core. Of course, the size of the partitions available determines the maximum dimensions for each waste area. During execution of a production run, the program will interpret commands to change the number and size of the work areas to handle successively larger or smaller amounts of data. At each redimensioning step the program will proceed if the product of the row and column dimensions of each area (the same for all) and the number of work areas does not exceed available core.

The specific index number computations, which may involve adjustments based on completeness of the available data, are set up somewhat less flexibly since they each involve several steps. An arbitrary run begins by inputting from cards (or reading from stored datasets) the export and import values and quantities into four assigned storage areas. The data are stored in matrix form. By inputting the necessary command and control cards (explained in the PINUP manual), the program manipulates these matrices to gain the desired result.

The sample of commodities for the index numbers does not cover the entire list which involves over 1200 items. Hence, the fractional coverage for each year is computed and plotted from grand totals, and then used to standardize the numerators and denominators of the price indices to 100%. Following Imlah, the various 40-60 year time spans are split into three to five groups of years with two year overlap and different base years selected for each group. Within each group relatives are computed for both import and export data.

After the price and quantity relatives have been computed, the NBAR (net barter terms of trade) command divides term by term

the export PDEX (price index) vector by the import PDEX vector yielding a vector containing the net barter terms of trade relatives. Manipulation of the other commands yields the gross barter terms of trade relative, the total volume of trade relatives and so on through the final routine. (See Table B). The results are printed and plotted at each stage of the operations. To gain more insight into the trend of the indices which may fluctuate due to missing items, a moving average of either three-or five-year periods over the time span of the group considered may also be computed.

The program checks for errors to avoid invoicing the computer error message facility which may not be explicit and to avoid unintended computations. Should a run «bomb» in the middle, if the program detects the error, it will list the contents of each disk or tape in a directory at the end of the run. This is also part of the normal exit procedure. If the error is detected by the system, those files will still be available. The user can recommence the run with modifications only to his job control language if the file was created in the bombed run, and to the dataset group setup cards, specifying the number and type of matrices on each file.

IV. PERIODS OF GROWTH OF EXPORTS AND IMPORTS.

Trade movements between Britain and the Kingdom of the Two Sicilies in the half century between 1817 and 1869 show a clearly discernible pattern — a long period of slow growth from the post-Napoleonic years through the 1840's years of high protective duties and navigation laws — followed by a phase of rapid growth during the free-trade decades of the 1850's and 1860's. Britain accounts for approximately one-third of the total trade of the Kingdom of the Two Sicilies during this half-century and maintained a favorable balance of commodity trade in thirty-two of the fifty-two years. The value of British exports to South Italy increased approximately three times between 1817 and 1869 while British imports from South Italy increased almost ten times.

Sir Robert Peel's tariff reforms leading to the abolition of the protective system in Britain in 1842 and 1846, and a more moderate protective policy in the Kingdom of the Two Sicilies under Ferdinand II in 1845 and 1846 had a stimulating effect on British-Italian trade in the 1850's. Italian unification and the extension of the more liberal Sardinian tariff to South Italy (1861) gave an added impetus to trade expansion in the 1860's. Short period movements of the trade cycle are more complex as imports and exports undergo phases of expansion and contraction in response to exogenous factors, such as the state of business activity in Britain and Italy, harvest fluctuations, price movements, random political and economic events, etc.

Graph 1 and Table A show that Britain was generally a net exporter to South Italy between 1817 and 1850. There is a close correspondance between import and export curves in these decades particularly in the 1830's and 1840's when absolute values, amplitude of fluctuation and trend rates of growth show a very high degree of regularity. In the 1850's the import-export relations are reversed as Britain becomes temporarily a net importer from South Italy. This was a consequence of increased demand in Britain for Italian imports during the Crimean War, in which the Kingdom of Naples remained neutral, and of high import prices of wine, silk, sulphur and other agricultural products as a result of crop disease and poor harvests in Italy in the late 1850's.

Cyclical fluctuations in British exports are governed by the state of the business cycle in Britain through its effect on British incomes and demand. The correspondance, of course, is not always a perfect one. Thus British exports fall from a peak during the post-Napoleonic boom in 1818 to a trough in 1821, recover to the financial crisis of 1825 and fluctuate within a narrow range in the 1830's and 1840's — rising in the boom of 1836, falling in the panic of 1837, recovering in 1840. Exports remain stable during the depression of 1841-42, but rise vigorously during the boom of 1846 and the recovery of 1849 and 1851. In the period of the mid-Victorian boom (1850-1869) exports show a sharply rising trend

interrupted by short downward swings in 1854 (Crimean War), 1857 (industrial depression), 1859 (Italian War), 1862-64 (cotton famine in Europe), 1866 (war and financial crisis) and 1867-68 (world-wide slump). Imports from Italy show an upward trend starting with the free-trade period in the U.K., rising during the 1850's to a peak in 1866, declining in 1861 and 1863 (post-unification crises in South Italy) and in 1867, but recovering during the export boom which begins in Italy at the end of the decade.

V. INFLUENCE OF DOMINANT EXPORTS AND IMPORTS IN NET BARTER TERMS OF TRADE.

The U.K. exported a variety of finished and semi-finished goods to the Kingdom of the Two Sicilies. These were predominantly cotton, woolen and line goods, such as cotton yarn, cotton cloth, muslins, linen and linen yarn, woolen cloths, woolen carpets and worsted stuffs; but also wrought metals and metal manufactures, such as bar iron, cast iron, sheet iron and boiler plate, hoops, hardware and cutlery, railroad equipment and rails; and colonial products such as fish, sugar, tobacco, etc. Britain imported from the Kingdom of the Two Sicilies primary products for industrial, chemical and medicinal purposes such as corn, beans, olive oil, wine, lemons and orange, brimstone, silk, liquorice juice, dyestuffs-shumach, madder root, barilla, cream of tartar, oil essences, etc.

Graph 5 presents price and quantity data for some leading commodities which play a dominant role in the behavior of the import and export indexes. The strong inverse movements in export volumes and prices of British textiles suggest a high price elasticity of demand in South Italy for textile manufactures in the first half of the nineteenth century. British textile prices fall very rapidly as a result of favorable movements in export profit margins, technological improvements and reductions in domestic unit costs while export volumes rise through the middle of the century. Large increases in export volumes of cotton yarns (cotton twist) and sharp

reductions in the price of cotton goods (calicoes), particularly in depression years, are worthy of note in that they suggest marketing difficulties in the British cotton industry.⁷ In depression years 1819-1820, 1826-1832 and in 1837-1842, sharp cuts in export prices and expansion in export volumes of yarn and cotton manufactures suggest over capacity. The slump in the British domestic market may have encouraged some dumping in South Italy to keep British factories operating.

Cotton yarn and cotton cloth volumes rise until 1851 and then decline during the Crimean War. The demand for cotton yarn recovers in 1858 but declines with competition from the developing cotton spinning industry in Naples. There is a dramatic decline in export volumes of cotton yarns and a great jump in prices during the cotton famine in 1862-1864 (U.S. Civil War). The demand for higher-priced cotton cloth exports rises to a peak in these years with only small increases in price. The most marked substitution effects resulting from the cotton famine are to be seen in the growth of demand for cheap British linens. Linen exports to the Kingdom of the Two Sicilies double, triple and quadruple in the 1860's. Linen, however, shows only a very slight rise in price.

Coal export volumes rise sharply from the late 1830's for the new railroad in Naples, and particularly after the Crimean War, for the Neapolitan merchant marine, and in conjunction with the development of the textile and metallurgical industries in South Italy.

Bar iron rises to a peak in the 1840's and again after unification. Both coal and iron show large absolute increases to satisfy rising demand in South Italy but the price indexes show much less fluctuation than in the case of textiles, suggesting a lower price elasticity in South Italy for products of heavy industry in the U.K. and greater difficulty in finding alternative sources of supply.

The Kingdom of the Two Sicilies was the leading supplier of olive oil for soap making, wool manufacture and illumination in

⁷ IMILAH, *op. cit.*, p. 125.

the late eighteenth century. During the Continental System, Naples lost her commanding position in the European market as new and cheaper sources of supply were discovered in Spain, Greece, and the Levant.⁸

British demand for olive oil grew rapidly after 1815. Between 1817 and 1831, the U.K. doubled her oil imports from the Two Sicilies despite poor olive harvests in 1819, 1823 and 1826. Rising imports were stimulated by British tariff reductions in 1825 and by lower export duties in Naples in 1823, 1824 and 1828. Imports from Naples, however, fell sharply in the following decade as England imposed differential duties on Neapolitan oil with new tariffs in 1829 and 1834. These duties were intended as reprisals for Navigation Laws enacted by the Neapolitan government which discriminated against English shipping. In the 1840's, English consumption of Neapolitan oil declined as cheaper surrogates such as palm oil, seed oils and mineral oil came into wider use. After the Commercial Treaty of 1845, Britain and the Kingdom of the Two Sicilies renounced discriminatory duties and olive oil imports revived. In the 1830's and 1840's Neapolitan producers attempted to compensate for the loss of the English market by increasing exports to Austria, Germany and Belgium. Olive oil markets stagnated, however, because of the large and unpredictable fluctuations in harvests and the lack of technological progress in the industry. Prices declined between 1821 and 1835 as traditional markets (England and France) contracted, but rose during poor olive harvests in South Italy in 1841, 1853 and 1859.

The U.K. imported almost all of its brimstone (sulphur) from Sicily in the 1820's for the manufacture of artificial soda and sulphuric acid. Demand for sulphur increased until 1838 when England suspended imports from Sicily in protest over the decision of Ferdinand II which granted a monopoly of the industry to a French syndicate, Taix et Cie. Between 1833 and 1837 the brimstone

⁸ BURSOTTI, G., *Biblioteca di Commercio*, (Naples, 1841-1846), vol. II, pp. 10-11.

industry had been faced with a crisis of over production and falling prices. England sharply reduced her imports in 1838 and 1840 as Palmerston threatened naval reprisal and the monopoly was abolished in 1840. The brimstone industry stagnated in the 1850's as cheaper iron pyrites replaced brimstone in the manufacture of sulphuric acid. Brimstone exhibited a highly inelastic supply curve typical of a backward industry using traditional methods. The industry was controlled by British interests in Sicily and price fixing was not uncommon.⁹ The boom in sulphur prices in the middle and late 1850's coincided with the Crimean War and increasing domestic use of sulphur to combat grape disease in Italy. The collapse of sulphur prices in 1859 followed a period of excessive speculation in sulphur futures.

As can be seen, the relative movements of prices of particular components of exports and imports shows considerable diversity. We have tried to explain these movements in terms of peculiar circumstances within the individual markets. A more comprehensive interpretation of the economic significance of price movements requires a closer study of the composite indexes of long time-series.

VI. CYCLICAL AND SECULAR CHANGES IN TERMS OF TRADE.

Having identified the movements in export and import prices as well as some of the more important components, we focus our attention on the movement in the composite NBT index that reflects the distribution of the gains from trade among the trading partners. We are interested in the cyclical fluctuations and secular trends in the terms of trade in order to study the exchange of values between the center and periphery.

⁹ SQUARZINA, F., *Produzione e Commercio dello Zolfo in Sicilia nel Secolo XIX*, (Torino, 1963), p. 23.

Since NBT represents the ratio of weighted export to weighted import prices, rising numbers indicate favorable movement for the United Kingdom and unfavorable movement for South Italy. As can be seen in Graph 2 and Table B, the NBT of the U.K. shows steady decline between 1817 and 1857. This is mainly due to the decidedly downward though erratic movement in the average prices of British exports to the Kingdom of the Two Sicilies. The single most important reason for this downward trend in export prices was a decline in production costs due to modern machine methods and an advanced factory system in Britain. Import prices undergo a short period of rapid decline in the deflationary decade 1815-1825, followed by a long period of relatively modest fluctuations without any identifiable trend through mid-century.

From 1817-1820 to 1826-1830 import and export price indexes fall at approximately the same rate, and the NBT declines very slowly. The average net barter index number for 1826-1830 is only 3% below the average for 1817-1820. After 1830, British export prices show a pronounced cyclical pattern. In the quinquennium 1831-1835 they are down by 40%, between 1841-1845 by 59% and between 1851-1855 they are 63% below the level of 1817-1820. U.K. export prices recover after 1855 bringing improvement in the NBT until 1866 when it declines once more. On the other side, Italian import prices fluctuate more gradually, falling by 21% between 1821-1825, by 27% between 1826-1830 and at their lowest point (1846-1850) they are 42% below the level of 1817-1820. From the standpoint of the entire period studied, these differences in the rate of decline in the import and export price indexes determine the behaviour of the average NBT index which falls from 226 (1817-1820) to 162 (1836-1840), a decline of 27%, and to 102 (1851-1855), a fall of 54% since 1817-1820.

The short-run fluctuations in the NBT suggest interesting analytical conclusions. South Italy's export prices (U.K. import prices) fluctuate widely, apparently in response to demand conditions in

the metropolis. This follows from the fact that South Italy's export price indexes often moved in the same direction as the volume indexes. For example, in 1821 a 15% increase in the U.K.'s import prices was simultaneous with a 30% rise in U.K. imports, indicating that an upward shift probably occurred in the demand for imports during that year. Thus the evidence suggests that the short-run income elasticity of demand connected with the «center's» business cycle was rather high. This observation would support the Prebisch generalizations regarding the instability of export earning of the less-developed countries. However, further work is needed to link the NBT to the differences in the rates of growth of the trading partners.

The fluctuations in the NBT and the component indexes are especially interesting when analysed in conjunction with the changes in the trade balances between the two partners. Economic historians and development economist today are concerned about the deterioration in the NBT of the developing countries largely because it is linked with, or is responsible for, the unfavourable trade balances of the periphery. The evidence in our case strongly confirms this interpretation. Of the possible fifty-one annual changes, the NBT changes in the same direction as the trade balance index in twenty-eight instances. Thus an increase in Italy's export prices (U.K. import prices) relative to import prices (U.K. export prices) i.e. an improvement in Italy's NBT, tended to be associated with the improvements in Italy's trade balance, and vice versa when NBT deteriorated. However, the signs of the changes in NBT and balance-of-trade indexes differed in twenty-three instances, demonstrating that complex changes in supply and demand conditions on both sides can prevent clear-cut generalization at this stage of our research.

Comparison of our NBT with that calculated by Imlah for the U.K. as a whole leads to important conclusions.¹⁰ As we expected,

¹⁰ Analysis of Gross Barter Terms of Trade cannot be pursued meaningfully here as we deal only with a portion of total trade and it is impossible to interpret the composite index when its components vary extensively.

the secular movement in our indexes and Imlah's indexes are quite similar. To begin with, we observe a decisive secular deterioration in U.K.'s NBT vis-à-vis Italy between 1817 and 1857. One has to agree with Imlah that despite the deterioration of her NBT the U.K.'s economic welfare did not necessarily suffer in this period because the change resulted mainly from rapid technological improvements and a corresponding reduction in real costs in a dynamic economy. At the same time, South Italy as a «periphery» clearly benefited by sharing the fruits of industrial progress in the metropolis through trade. However, South Italy did not gain additionally through improved prices of her exports to the U.K., undoubtedly because British income elasticity of demand for raw materials and agricultural produce was low and competitions from other suppliers considerable. Throughout the entire period studied, Italy's exports (U.K.'s imports) increased but Italy's export prices did not show a decisive trend even though short-term fluctuations were substantial by today's standards.

To conclude, the Prebisch thesis is contradicted by the British-Italian experience between 1817-1857, but supported by the evidence for the final decade studied. It is noteworthy that the U.K.'s improvement (South Italy's deterioration) of the NBT during 1857-1867 was again dominated by U.K.'s export rather than import prices. The evidence suggests that during that last decade not only was the demand for raw materials and agricultural products expanding less rapidly than previously, but that marketing practices for British exports were becoming less favorable to the periphery. Hopefully, these preliminary conclusions will be strengthened by an analysis of subsequent decades and of the experience of the other Italian regions. However, it is clear that there are definite limits to the improvement in the distribution of the gains from trade due to improved prices for goods exported by the less-developed countries. Rather, the key to the distribution of the gains lies in the behaviour of prices for the specialties of the economically advanced center countries.

Terms of Trade between South Italy and the United Kingdom 1817-1869

TABLE A

TOTAL VALUES OF FOREIGN TRADE
U. K. - KINGDOM OF TWO SICILIES (CURRENT PRICES)
(*British £'s Sterling*)

Year	U. K. Imports	U. K. Exports	Balance	Year	U. K. Imports	U. K. Exports	Balance
1817	227,325	863,636	636.311	1844	557,967	600,859	42.892
1818	547,197	1,309,120	761.923	1845	694,475	671,420	— 23.055
1819	347,169	1,048,971	701.802	1846	788,753	993,731	204,978
1820	225,292	783,950	558.658	1847	857,754	636,690	— 221.064
1821	332,249	647,946	315.697	1848	700,568	696,666	— 4.902
1822	274,307	1,060,678	786.371	1849	1,101,976	1,138,490	36.514
1823	428,820	913,996	485.176	1850	1,279,940	1,026,456	— 253.484
1824	372,849	941,521	568.672	1851	1,394,157	1,266,211	— 127.946
1825	630,803	547,677	— 83.126	1852	850,984	911,658	60.674
1826	368,148	681,110	312.962	1853	1,037,377	639,544	— 397.833
1827	324,560	516,405	191.845	1854	1,390,059	563,033	— 827.026
1828	479,517	554,812	75.295	1855	1,281,940	920,220	— 361.720
1829	319,090	654,261	335.171	1856	1,505,582	1,202,183	— 303.399
1830	541,187	787,743	246.556	1857	1,597,660	1,088,982	— 508.678
1831	660,141	585,144	— 74.997	1858	1,656,523	1,569,166	— 87.357
1832	316,928	454,528	137.600	1859	1,632,317	1,162,335	— 469.982
1833	589,050	557,579	— 31.471	1860	1,867,904	1,321,339	— 546.565
1834	650,039	758,829	108.790	1861	1,504,453	2,071,521	567.068
1835	661,592	621,124	— 40.458	1862	1,865,239	1,528,904	— 336.335
1836	805,971	856,057	50.086	1863	1,448,218	2,309,273	861.055
1837	509,128	638,612	129.484	1864	1,522,465	2,454,645	932.180
1838	716,599	806,058	89.459	1865	1,698,154	2,343,828	645.674
1839	509,418	516,370	6.952	1866	2,273,103	2,109,911	— 163.192
1840	844,308	731,220	— 113.088	1867	1,607,305	1,867,058	259.753
1841	432,868	702,697	269.829	1868	2,118,755	1,856,340	— 262.415
1842	1,013,125	708,462	— 304.663	1869	2,180,796	2,480,401	299.605
1843	789,484	824,349	34.865				

U. K. - KINGDOM OF TWO SICILIES - TERMS OF TRADE WITH VALUE

Year	U. K. Exports to Kingdom of Two Sicilies			U. K. Imports from Kingdom of Two Sicilies		
	Current Value	Volume Relative (1854 = 100)	Price Relative (1854 = 100)	Current Value	Volume Relative (1854 = 100)	Pr Relat (1854 = 1
1817	863,636	55.0	277.1	227,335	12.6	85
1818	1,304,120	83.0	280.0	547,197	25.1	154
1819	1,048,971	66.9	276.1	347,169	18.0	157
1820	783,950	55.1	253.3	225,292	15.7	104
1821	647,946	50.8	230.3	332,249	20.4	115
1822	1,060,678	85.2	219.2	274,307	21.3	100
1823	913,996	77.8	210.4	428,820	33.5	94
1824	941,521	85.5	194.2	372,849	32.7	84
1825	547,677	43.7	227.0	630,803	52.3	85
1826	681,110	53.8	219.2	368,148	30.7	86
1827	516,405	45.3	198.6	324,560	20.5	117
1828	554,812	55.9	226.6	479,517	35.7	98
1829	654,261	69.0	162.0	319,090	26.5	87
1830	787,743	76.7	171.8	541,187	55.1	65
1831	585,144	66.0	153.0	660,141	60.5	77
1832	454,528	51.8	152.2	316,928	26.4	87
1833	557,579	61.3	161.4	589,050	41.8	101
1834	758,829	84.1	157.2	650,039	43.3	106
1835	621,124	63.6	173.8	661,542	42.4	105
1836	856,057	80.5	186.6	805,971	55.8	95
1837	638,612	63.4	174.1	509,128	46.0	80
1838	806,058	98.6	140.6	716,599	56.8	85
1839	516,370	58.5	156.2	509,418	30.0	122
1840	731,220	92.2	138.4	844,308	53.1	112
1841	702,697	93.0	131.9	432,868	26.7	119
1842	708,462	99.7	129.7	1,013,125	67.7	125

Terms of Trade between South Italy and the United Kingdom 1817-1869

TABLE B

VOLUMES, AND AVERAGE PRICES FOR EXPORTS AND IMPORTS 1817-1869

Total Volume Relative	U. K. Net Barter Terms of trade with Kingdom of Two Sicilies	U. K. Gross Barter Terms of trade with Kingdom of Two Sicilies	Total gain from trade	Market or trade balance	Market gain from trade
51.3	308.7	435.3	158.5	95.8	690.3
94.0	181.3	329.8	170.5	59.8	562.4
68.4	175.4	371.7	120.3	65.2	447.4
50.5	242.6	350.0	122.6	84.9	429.1
48.5	192.3	249.3	93.4	47.9	232.9
66.4	217.9	400.1	144.8	87.2	579.3
66.8	223.0	232.0	149.1	51.7	346.0
65.9	229.1	261.2	151.0	59.8	394.5
58.2	253.5	83.7	147.5	21.2	123.5
53.8	252.5	175.2	135.8	44.2	238.0
42.5	169.2	221.0	72.0	37.4	159.2
45.9	231.0	156.5	106.1	36.1	166.1
50.3	185.5	260.4	93.3	48.3	243.0
70.0	245.8	139.4	172.1	34.2	239.8
64.6	198.0	109.0	128.1	21.5	139.6
39.3	173.4	196.1	68.2	34.0	133.8
58.3	159.6	146.6	93.1	23.4	136.6
72.6	147.9	194.1	107.5	28.7	208.6
65.8	158.5	149.7	104.4	23.7	156.3
86.8	187.8	144.1	163.0	27.0	234.8
58.8	217.0	137.7	127.7	29.8	173.8
78.9	156.6	173.4	123.6	27.1	214.4
52.1	127.7	195.0	66.6	24.9	129.9
81.6	123.3	173.4	100.6	21.4	174.7
57.5	110.7	347.4	63.6	38.4	221.2
79.4	103.7	147.2	82.3	15.2	121.2

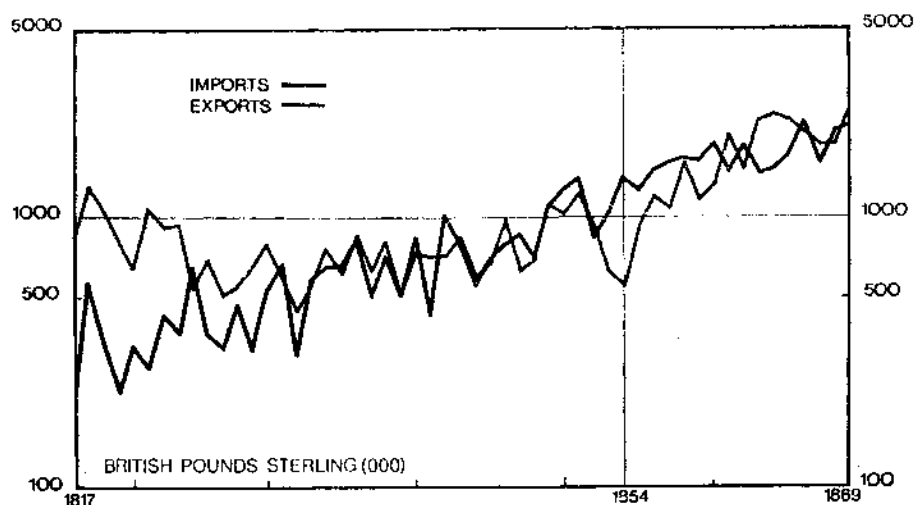
Continued: TABLE B — KINGDOM OF TWO SICILIES - TERMS OF TRADE WITH VALUES, VOLUMES, AND

Year	U. K. Exports to Kingdom of Two Sicilies			U. K. Imports from Kingdom of Two Sicilies		
	Current Value	Volume Relative (1854 = 100)	Price Relative (1854 = 100)	Current Value	Volume Relative (1854 = 100)	Price Relative (1854 = 100)
1843	824,345	124.8	126.1	789,484	67.7	82.6
1844	600,859	84.3	146.4	557,967	45.9	88.1
1845	671,420	80.4	151.9	694,475	57.9	87.2
1846	993,731	134.1	129.3	788,753	64.4	87.9
1847	636,650	81.5	142.2	857,754	60.8	101.8
1848	695,666	116.5	111.6	700,568	59.1	85.4
1849	1,138,450	206.2	98.7	1,101,976	94.7	82.6
1850	1,026,456	175.4	104.6	1,279,940	106.2	84.7
1851	1,266,211	304.7	100.8	1,394,157	102.1	96.2
1852	911,658	162.8	99.5	850,984	70.4	88.1
1853	639,544	112.0	103.5	1,037,377	76.5	96.6
1854	563,033	100.0	100.0	1,390,059	100.0	100.0
1855	920,220	176.0	94.1	1,281,940	87.5	104.9
1856	1,202,183	215.8	101.8	1,505,582	97.9	111.3
1857	1,088,982	181.5	111.2	1,547,660	102.4	132.7
1858	1,569,166	261.0	108.7	1,656,523	110.5	105.9
1859	1,162,335	174.2	124.8	1,632,317	102.2	112.4
1860	1,321,339	200.6	125.1	1,867,904	102.9	129.3
1861	2,071,521	281.6	134.1	1,504,453	93.8	116.7
1862	1,528,904	224.6	132.6	1,865,239	118.6	110.9
1863	2,309,273	260.8	164.6	1,448,218	95.6	110.1
1864	2,454,645	241.5	195.0	1,522,465	96.9	111.6
1865	2,343,828	253.7	173.8	1,698,154	112.9	109.0
1866	2,109,911	219.2	178.4	2,273,103	147.0	112.3
1867	1,867,058	224.9	159.3	1,607,305	99.4	115.2
1868	1,856,340	245.2	150.9	2,118,755	122.5	123.3
1869	2,480,401	321.4	149.6	2,180,796	126.1	125.2

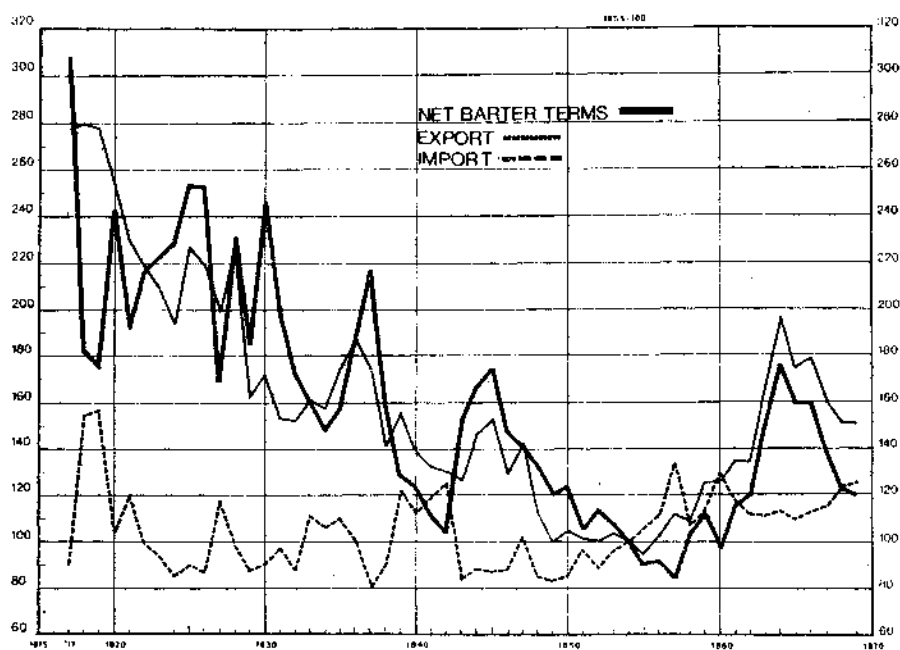
Terms of Trade between South Italy and the United Kingdom 1817-1869

AVERAGE PRICES FOR EXPORTS AND IMPORTS 1817-1869.

Total Volume Relative	U. K. Net Barter Terms of trade with Kingdom of Two Sicilies	U. K. Gross Barter Terms of trade with Kingdom of Two Sicilies	Total gain from trade	Market or trade balance	Market gain from trade
79.6	152.5	184.3	121.5	28.1	224.0
54.5	166.1	183.6	90.5	30.4	166.2
68.2	174.2	138.9	118.8	24.1	165.1
91.3	147.0	208.3	134.2	30.6	279.7
75.1	139.7	134.0	105.0	18.7	140.7
69.1	130.7	197.0	90.3	25.7	178.0
114.1	119.6	217.6	136.4	26.0	296.9
118.5	123.5	165.1	146.4	20.4	241.8
119.8	104.8	298.2	125.5	31.2	374.4
88.8	113.0	231.1	100.4	26.1	232.0
85.3	107.1	146.3	91.4	15.6	133.7
100.0	100.0	100.0	100.0	100.0	100.0
112.0	89.7	201.1	100.5	180.5	202.1
135.7	91.5	220.4	124.1	201.7	273.6
121.9	83.9	177.2	102.2	148.6	181.2
164.1	102.7	236.3	168.5	242.6	398.2
141.2	111.0	170.4	156.8	189.2	267.2
159.2	96.8	194.9	154.0	188.6	300.2
181.4	114.9	300.0	208.4	345.0	625.9
167.8	119.6	189.3	200.7	226.4	380.0
184.3	149.5	272.7	275.7	407.7	751.4
193.2	174.7	249.1	337.4	435.1	840.6
197.5	159.4	224.6	315.0	358.0	707.4
217.3	158.9	149.1	345.3	236.9	514.8
170.2	138.3	226.2	235.4	312.9	532.5
193.1	122.4	200.2	236.4	245.0	473.2
225.4	119.5	254.8	269.3	304.5	686.2

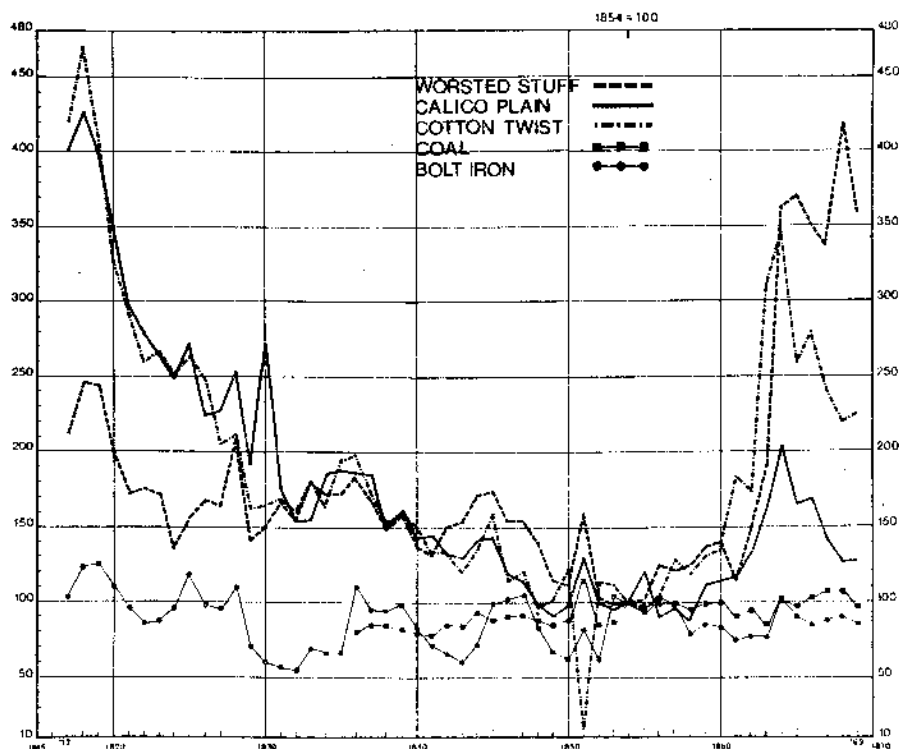


Graph 1. Total Values of Imports and Exports Between the U.K. and the Kingdom of the Two Sicilies, 1817-1869.

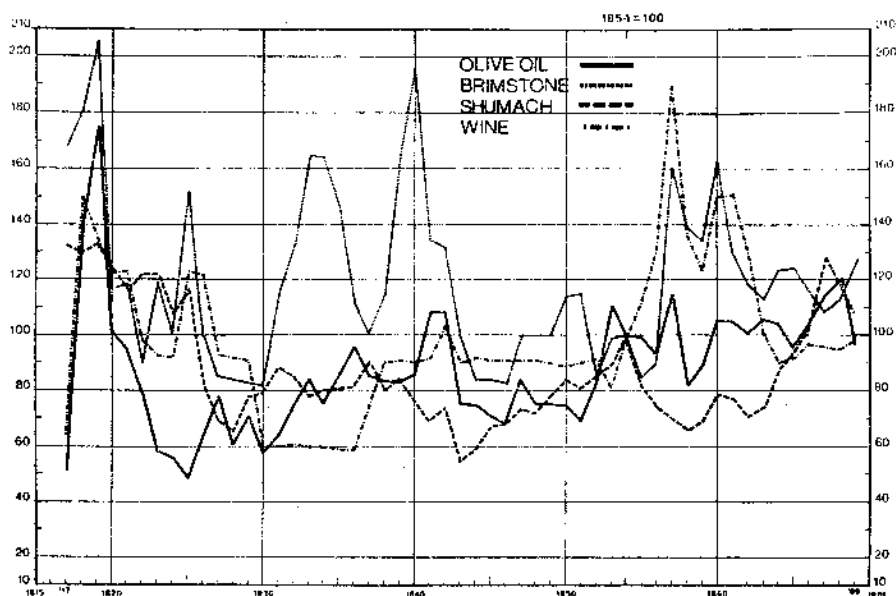


Graph 2. The Net Barter Terms of Trade of the U. K., with the Kingdom of Two Sicilies. Weighted average export and import prices, 1817-1869.

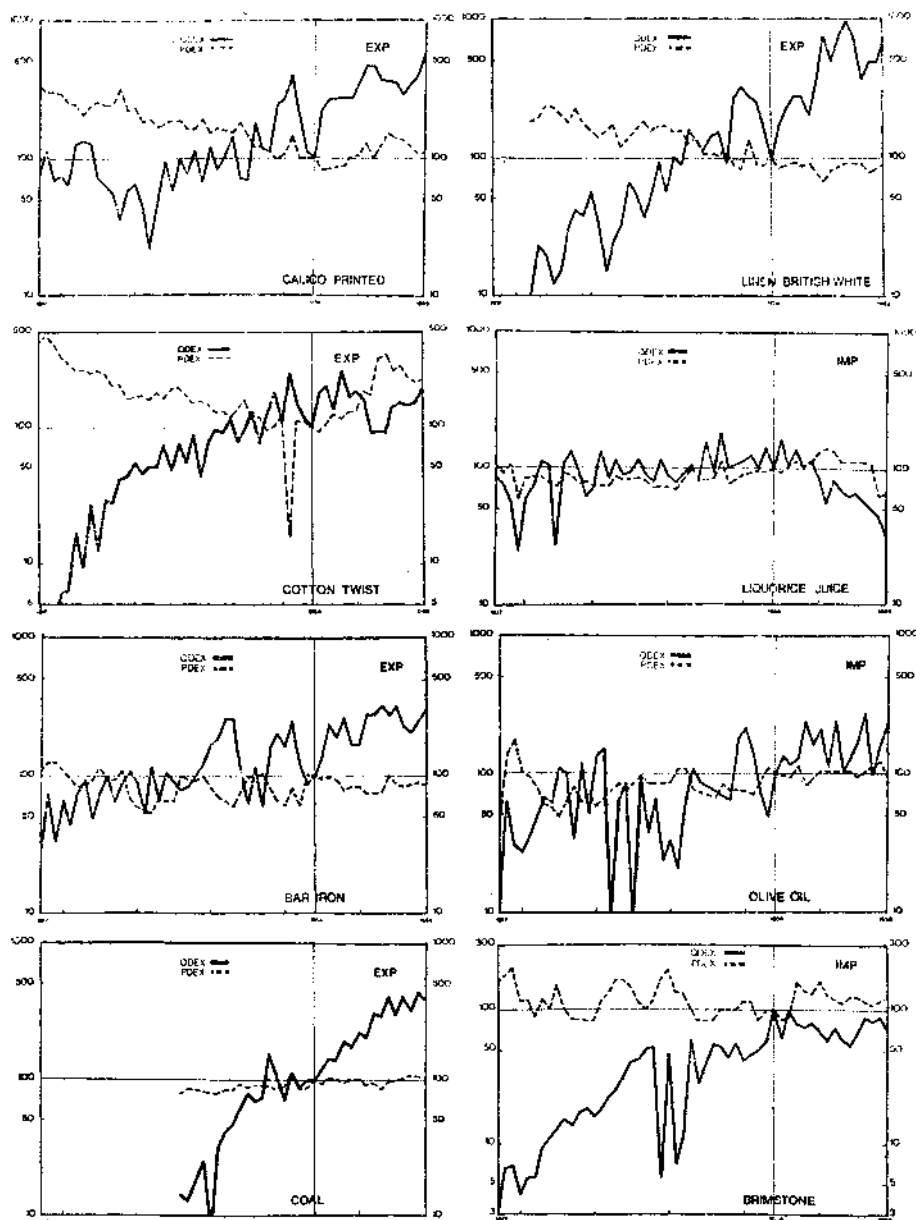
Terms of Trade between South Italy and the United Kingdom 1817-1869



Graph 3. Weighted Average Prices of Selected Exports from Great Britain, 1817-1869.



Graph 4. Weighted Average Prices of Selected Imports from the Kingdom of the Two Sicilies, 1817-1869.



Graph 5. Weighted Average Prices (PDEX) and Volumes (QDEX) of Imports and Exports Between the U.K. and the Kingdom of the Two Sicilies, 1817-1869.

APPENDIX ON SOURCES AND METHODS

Continuous and homogeneous series on the foreign trade of Great Britain and the Kingdom of the Two Sicilies for the period 1817-1859 have been taken from the British Customs Registers in the Public Record Office, London. These registers were begun in 1697 with the establishment of the office of the Inspector General of Imports and Exports and were compiled annually from January to January. The foreign trade statistics in the Customs Registers were classified by country and merchandise and contain data on the quantity and value of all commodities and the port from which the commodity was imported or exported.

Commodity data in the Customs Registers were compiled on a country basis. In the case of Italy the registers contain trade returns between Britain and the several Italian States (Kingdom of Naples and Sicily, Granduchy of Tuscany, Papal States, Kingdom of Lombardy and Venetia and Kingdom of Piedmont) between 1815 and 1869 and aggregate data for unified Italy after 1870. The statistics for the Kingdom of the Two Sicilies include trade flows between the U.K. and the continental and insular regions of the Kingdom of the Two Sicilies. There are separate statistical series on imports and exports between Naples and Sicily and the U.K. between 1815-1826 and 1861-1869 and an aggregate series for both provinces with the U.K. between 1827-1860. We have combined the separate returns to form a single series on imports and exports between the Kingdom of Naples and Sicily and the U.K. for the period 1817-1869.

A representative list of commodities and commodity groups have been compiled from the approximately twelve hundred items in trade between Great Britain and the Kingdom of the Two Sicilies. Systematic data on annual commodity movements (quantities and values) have been collected for 200 imports, 156 exports and 50 re-

exports.¹¹ These commodities account for over 80% of the annual value of trade. Corrections for differing degrees of understatement of quantities and values in the Customs Register have been made wherever possible by checking the commodity data against outside sources.

The statistics on imports and exports in the Customs Registers are expressed in legal units — centerweights, pounds, gallons, tons, etc. Conversion coefficients have been applied to commodities to assure homogeneous quantity series: for example, we have converted wollen manufactures and worsted stuffs from piece units to yards (1817-1863); woollen and worsted yarn from centerweights to pounds (1817-1863); iron (except bar and pig) from centerweights to tons (1815-1844); wheat, maize, beans etc. from quarters to centerweights (1817-1841); cotton wool from pounds to centerweights (1817-1841); olive oil from gallons to tuns (1827-1841); wine from tuns to gallons (1815-1827).

Value Series.

Imports and re-exports in the Customs Registers are expressed in « official » values until 1853 and in current values beginning in 1854. « Official » values are calculated according to English customs practice on the average price of imports prevailing in the year 1694. The « official » value of imports into the U.K. from the Kingdom of the Two Sicilies between 1815 and 1854 is therefore a sum of quantities with fixed weights based on the prices of 1694. These weights are unrealistic in terms of the prices of the nineteenth century taking too little account of structural changes in trade which occur over long periods. They had therefore to be replaced.

We have computed new volume series for the import index in order to keep as much precision as possible in the calculation of weights. New price series for the most important commodities imported from the Kingdom of the Two Sicilies have been computed from current price data between 1815 and 1853. These

¹¹ Re-exports have not been dealt with as they represent only a very small percentage of total values. They will be included in the analysis of the combined regions.

series account for between 70 and 90% of total official import values in all years.

The Customs Registers contain two sets of figures on British export values between 1815 and 1869 — «official» values and «declared» or real values. Declared or real values were compiled on the basis of declarations furnished by British merchants prior to shipment of goods. They have been found by earlier investigators to be sufficiently close to market prices of the time so that we have used them in the export value series. Export values between 1815 and 1869 are then derived from the trade figures themselves.

Price Series.

Quarterly price data for the most important commodities in value terms imported from the Kingdom of the Two Sicilies into the U.K. have been taken from the *London New Price Current* and the *London Mercantile Price Current*. These price series after deduction of duties and drawbacks, have been computed from the price currents for the following commodities: brimstone, liquorice juice, madder root, olive oil, shumac, wine, lemons and oranges, raw silk, argol, juice of lemons, essence of lemons, essence of bergamot, linseed, barilla. The import price series have been adjusted to conform to the quantity measures in the Customs Registers. In the absence of price data for the South of Italy for linseed we have used a price series from Odessa. For lemon juice and essence of lemon we have used a series specified as Mediterranean. Quarterly price data are based on the average of the high and low price for a single week in each quarter. This is generally the first week of January, March, June and September.

Exports are recorded as f.o.b. Imports are c.i.f., that is cost, insurance and freight included in the valuation.

Volume Series.

Volumes have been calculated by multiplying the quantities of individual commodities imported or exported by the current prices of those commodities during an appropriate base year. To keep

volume weights in relation to changes in the price structure, the long period 1817-1869 has been divided into shorter intervals of approximately ten to thirteen years duration. For each of the shorter periods we have calculated volumes of imports and exports according to its own base year.

PRICE BASE PERIODS FOR VOLUME SERIES
FOR U.K. - KINGDOM OF TWO SICILIES TERMS OF TRADE 1817-1869

Price base periods	Base Years	Link years (with next period)
1817-1825	1823	1824-1825
1824-1835	1830	1834-1835
1834-1846	1840	1845-1846
1845-1858	1854	1857-1858
1857-1869	1865	

We have made each short period overlap by one year in order to link the separate calculations over short periods into a continuous sequence. In linking the shorter periods together we have selected 1854 as the final base year so that the volume of imports and exports have been calculated on the basis of the prices ruling in 1854. In this way we have taken into account changing price relationships in ascertaining volumes.

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