External Trade in Italy, 1922-38 .Some Evidence from Trade Index Numbers

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External Trade in Italy, 1922-38. Some Evidence from Trade Index Numbers*

1. *Trade index number*

This paper presents new estimates of value and quantity indices for Italian external trade in goods from 1922 to 1938. Trade in goods is defined so as to exclude transit trade and reparations but to include trade with the Italian colonies and possessions. The quantity is defined as the net weight of the goods transferred or their number, and the unit value as the value per unit of quantity.

The paper presents the total net value and quantity indices and compares them with previous estimates published first by the Confederazione Italiana dell'Industria and subsequently taken over by the Italian Central Statistical Office (henceforth ISTAT). It also presents new partial indices (subaggregated into separate series) for some significant components classified according to the Standard International Trade Classification (henceforth SITC).[1] The constructed price and quantity indices are fixed-weighted indices.

What ISTAT tells us about the construction of their trade series is not much and is not by any means clear. Firstly, we are told that the available ISTAT series is a sample series and, although it is claimed that the sample is very large, we are not told the categories that have been left out. Secondly, the old unit values figures are chain indices applied to the Laspeyres formula, using the previous quantities as weights; a procedure that can considerably distort the price changes figures when the series show rapid variations.[2] Thirdly, quantity indices are indirectly obtained by dividing total current value indices by unit value indices, a procedure which is not particularly recommended.[3]

Curiously ISTAT presents two price (actually unit value) and

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quantity series of imports and exports of goods, which do not match, although they claim to have obtained them themselves from the same sources. They are published in:

1. ISTAT, *Bollettino mensile di statistica* (briefly *Bollettino*), various issues. The series were already published in Confederazione Italiana dell'Industria, *Bollettino di notizie economiche*, and have subsequently been taken up by ISTAT.
2. ISTAT, *Sommario di statistiche storiche dell'Italia, 1861-1965*, Rome 1968, Table 75 (briefly *Sommario*); these data have been recently republished with the title *Sommario di statistiche storiche dell'Italia, 1926-1985*, Rome 1987.

The two sources are compared in Table A.1.

ISTAT, *Indagine statistica sullo sviluppo del reddito nazionale dell'Italia dal 1861 al 1956*, Annali di statistica, series 8, vol. 9, Roma 1957 (briefly *Reddito nazionale*) provides a deflator for the current balance (i.e. merchandise balance + services + labor and capital income). This is detailed in the subsequent ISTAT, *Cento anni di sviluppo economico e sociale dell'Italia*, Roma 1961, p. 67, where two separate indices are provided, one for the debit side of the current account and one for the credit side of it. These two indices are also used in *Sommario*, Table 109, and are part of the indices required to obtain the national income estimate at constant prices.

Strangely enough, the value of exports and imports at constant prices used to build the *Reddito nazionale* index at constant prices are not obtained with the help of the indices of import and export quantities of goods published in the same source (*Sommario*) and are hardly reconciliable with either the *Sommario* or the *Bollettino* indices of the quantities traded.[4]

Unit value and quantity series presented in this paper appear rather different from their available counterparts: the ISTAT *Bollettino* and the *Sommario* indices. Section 2 of the paper describes the sources and methods underlying the present estimates of price and quantity indices. Section 3 comments on the discrepancies between our indices and the other available series. Section 4 covers the derivation of subaggregated indices. Section 5 compares the Paasche and Laspeyres quantity and unit value indices and draws some conclusions about the Italian merchandise trade position in the interwar years.

2. *Unit values and quantity indices*

The sources for unit value and quantity indices are the *Movimento commerciale* and *Commercio di importazione e di esportazione*.[5] These are the official data collected by the Customs Offices based on declarations by importers and exporters. The shortcomings of these declarations are well known and are dealt with elsewhere.[6]

The newly-constructed quantity and unit value indices are presented in Table A.1, cols. 1, 2, 3, 4, and have been obtained from the disaggregated series (4-digit classification). Unit value indices are defined dividing total value by quantity. They often show erratic behavior which hardly resembles that of a price;[7] these inconsistent figures are the result of the inclusion in a specific (small) category of heterogeneous goods of very different value and weight when the relative importance of the subcomponents varies abruptly in the course of time. As we shall see later for textiles, the significance of the unit value indices as indices of export and import prices becomes rather obscure.

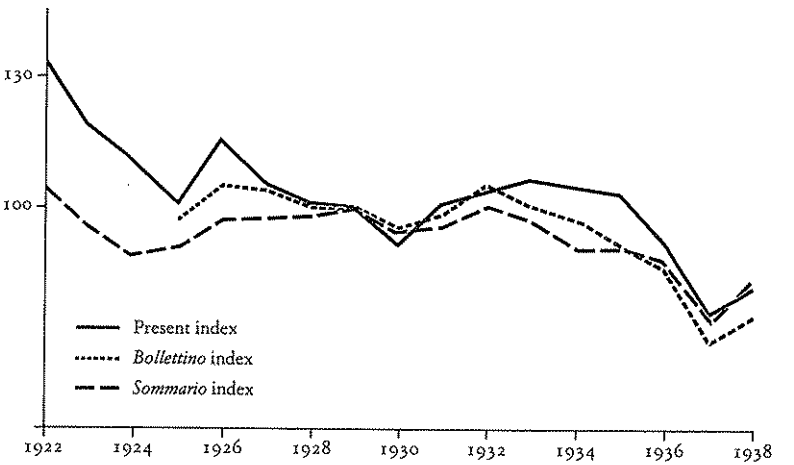
Every time we met such a problem we added up quantities and total values to get a more comprehensive set of data. This procedure had to be followed on quite a number of occasions and we finally ended up with a 3-digit classification. Quantity and unit value indices are fixed weight indices of this 3-digit classification. Quantity (unit value) indices are the sums of physical (unit value) indices, weighted by 1929 values (quantities) for the indices up to 1929 and by 1938 values (quantities) for indices from 1930 up to 1938. They are weighted aggregative indices constructed using base year weights, i.e. Laspeyres indices.[8] We also computed a chain index. We would expect this index to be equal or nearer to the *Sommario* index, according to the ISTAT specification. The result turned out to be rather different for the exports. It seems to us that the ISTAT sample coverage must have been inadequate, although in the absence of disaggregated series it is difficult to clearly pin down the components that have probably been left out.

The use of a single base for a period of seven or ten years avoids the arbitrary character of bases far removed from the period studied. With respect to annual linking, it simplifies the interpretation of changes extending over several years; nevertheless it does introduce into the year-to-year comparisons some elements extraneous to the years compared.

The list of covered commodities did not remain constant throughout the period. Changes are due to the increase in detailed information covering cheese, silk products (to account for the growing artificial silk components), vehicles and some metals and chemicals. In most cases these goods were traded during the whole period but were not adequately classified: in such cases we placed the newly-specified commodities in the previous class during the whole period to minimize shifts in composition within the two sub-periods. If the item was traded in the base year but not in some year in between, the price is calculated as a linear interpolation of the prices preceding and following the missing item.

The most striking difference among the ISTAT index and our index, both on base 1929, is that our unit value index is relatively lower for imports and higher for exports both in the 1920s and in the 1930s. When we compute the terms of trade index,[9] the ISTAT series shows worse terms of trade, especially for the 1920s: the capacity of exports to buy imported materials and the contribution of exports to the final demand in this period might have been larger, according to our calculations, than it seems to have been with the previous available series.[10] The terms of trade are depicted clearly in Figure 1.

Figure 1
Italian Terms of Trade Indices: Various Estimates, Index Numbers, 1929 = 100



Source: Appendix, Table A.1. The Terms of Trade Index is defined as the ratio between the export unit value index and the import unit value index × 100.

3. *Discrepancies between the Central Statistical Office indices and our indices*

The unit value and quantity series presented in this paper turn out to be rather different from the ISTAT series, particularly for quantity and unit value export indices.

Firstly, the present export unit value index shows much more higher values than the ISTAT in the years 1922-25 and in the mid-1930s. The reasons are far from clear in the absence of details concerning the disaggregated components of the ISTAT index. The present estimate points to a good performance for *Textiles* (SITC 6.5) export prices (1922-26), *Mechanical instruments and vehicles* (SITC 7.1) in the mid-1920s (1925-26) and export prices of *Agricultural products* (SITC 0.) in the 1930s and again *Mechanical instruments* in 1938.

Secondly, the revaluation of the lira (1926) is accompanied by a more rapid decrease in export unit values than accounted for by the previous series. This suggests strong competitive behavior by Italian exporters who were trying to hold their position in a feeble world market, despite a possible loss in profits per unit of output. This is confirmed by the stability of the Italian export quantity index.[11]

Thirdly, the present estimate for exported and imported quantities shows a slightly sharper decline from 1929 to the mid-1930s and a lower growth rate in the late 1930s, primarily because the old *Bollettino* estimates are constructed dividing current values by the unit value index, a procedure which gives a higher quantity index each time quantities and unit values grow or decrease together; this happened to both imports and exports.[12]

The ISTAT amended the *Bollettino* estimates in the right direction in the subsequent figures published in the *Sommario*: the revision matches rather well with our figures as far as imports are concerned, but the correction seems far from adequate for the exported quantities.[13]

Fourthly, the inclusion of trade with the Italian colonies and possessions may also be responsible for the higher ISTAT unit value index in 1936. The Italian colonies were part of the Italian market and were protected from external competition by the Italian tariff and exchange control. As we would expect in a sheltered market, the Italian domestic price index rose over the unit value index for exports, which was kept low by the action of foreign competitors: for the same reasons exports to the colonies

were sold at inflated relative prices, presumably at increasing unit values relative to the general export unit values.

To prove the above we built a sample index of unit values of exports to the colonies and, as Figure 2 shows, the result points to a higher selling price, once the items exported to the colonies have been given the same weight as in total Italian commodity trade. The weight of colonial trade reaches its maximum at 1936, so that the ISTAT series for export unit values, which is a moving average series, gives excess weight to the goods exported to the colonies, particularly in 1936. As these exports declined rapidly after the Ethiopian war, our index, based on 1938, gives less weight to them than the ISTAT index.[14]

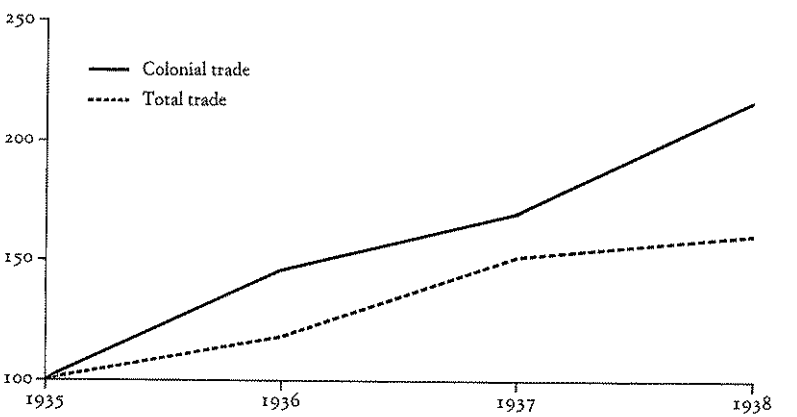
4. *Subaggregated indices*

The new subaggregated indices are presented in Tables A.2 and A.3. They are constructed to fit into the SITC 1-digit classification.

The subaggregated series have proved of interest to us for several reasons. We shall refer extensively to the subaggregated indices to comment the Italian economic performance in section 5; in addition the process of construction of the disaggregated

Figure 2

Unit Value Index of a Sample of Italian Exports: Overall and to the Italian Colonial Possessions. Index Numbers 1935 = 100



Source: *Commercio di importazione e di esportazione*. Laspeyres unit value indices with quantities exported in 1936 as weights. The sample covers around 50 per cent of Italian exports to the colonies.

series has pointed out two possible sources of misunderstanding in the data. As regards the mechanical components, in 1935, ISTAT changed the classification of the quantity of *Autoveicoli* (classes 1431 to 1437) from numbers to weights and numbers, but recorded, in the 1935 volume, the 1934 figures by calling them weights instead of numbers. This error appears also in the summary tables of the volume and can elude even a careful reader. We do not know whether ISTAT perceived the error in their calculations: the ISTAT indices are possibly correct as the error was afterwards rectified in the subsequent volumes. The other most important subaggregated series relates to textile exports. Here we clearly see the rapid decline of the textile unit value of exports in the 1920s; this is much steeper than the decline in the price of silk fabrics and it is due to the inclusion in a single class of textiles made up of natural silk and artificial silk products (till 1929). As the latter had a lower price per unit of measure but grew very rapidly in importance, the subsequent unit value series declines more rapidly than each single price component.

This is basically the result of the inclusion of goods of a different quality in a single class and of the fact that the goods of the lower quality (textiles of various fabrics mixed with artificial silk), which were virtually non-existent at the beginning of the period, have grown in a few years to 30 per cent of the total exports of silk products.

5. *Paasche and Laspeyres indices*

We computed the Laspeyres and the Paasche indices and they are recorded in Table A.1 and Table A.4 for the aggregate values.

The two series of indices are of interest for two reasons. Primarily, the difference between Paasche and Laspeyres indices sheds light on the range of possible "errors" in comparisons of one type of index with another: the extent of Paasche-Laspeyres differences indicates whether any relationships are strong enough to make this type of formula errors unimportant.

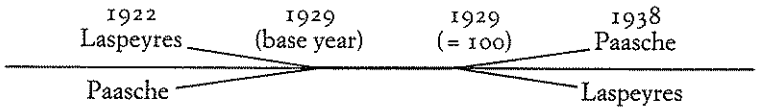
Secondly, since the base year is at the end, the Paasche unit value index gives more weight than the Laspeyres unit value index to those commodities which have declined in quantity relative to the average (for which q_t/q_{t+1} is greater than the average). This difference in weighting is important as regards the meaning of discrepancies between the two indices.[15] Let us suppose that the Laspeyres unit value index is higher than the Paasche. This means that the Laspeyres index declines in comparison to the

Paasche. This is to say that the base year weights are heavier than the given year weights for the commodities with the highest relative price–those for which prices fall the most or rise the least. There is a shift in quantity toward the commodities that fell relatively in price and this suggests a "substitution effect."[16]

The most dynamic components of exports are those whose prices have been drastically reduced throughout the period and we might also say that this behavior is typical of a strong competitive market where one can sell only by cutting prices. We can also say that this is a market where supply conditions are of predominant importance and there are no scarcity problems, as was indeed the general case for the interwar period.

If the Paasche unit value index is higher than the Laspeyres, this means that the Paasche has relatively declined in the course of time. That is to say, the base year weights are heavier than the given year weights for the commodities with the lowest price ratio (p_t/p_{t+1}), in other words those whose prices rose the most or fell the least. There is a shift in composition towards the commodities that rose relatively in price and this suggests both that they are highly complementary and also that a rigid production and consumption structure exists.[17] It could also be that the supplier controls the market and that the price is controlled in a oligopolistic environment.

Each year can be rigorously compared only with the base year of the period, but a steady tendency in the ratio can be identified with a gradual change in composition.



The interpretation of the Laspeyres/Paasche ratio (henceforth LA/PA) is more complicated when the two indices are placed on the 1929 base by linking. The situation is transformed as in the previous figure. For the 1929-38 years the higher Paasche means a substitution effect while a higher Laspeyres suggests complementarity or rigidity in the production structure.

The Italian data suggest that the difference between the Paasche and Laspeyres indices is not large for imports, while there is an evident drift of the ratio of the Laspeyres over the Paasche index for the exports. This is particularly strong in the 1920s and points to a substitution, in our export mix, towards commodities becoming relatively cheaper (Table 1).

The position of Italy in the 1920s was that of a marginal competitor in the manufacturing sector, with no monopoly in any

product; the price element was important in securing a part of the market for a latecomer with no well-established reputation, both for textile and for mechanical exports. It is interesting to note the different pattern between agricultural exports and manufactured goods. For the *Agricultural products* (SITC 0.) the ratio LA/PA is, in the 1920s, greater than 1 and points to a shift in exported quantities towards the commodities that fell rapidly in price (mainly rice, included in SITC 0.4, *Cereals*) and this suggests that supply conditions were of primary importance in determining the composition of Italian agricultural exports; supply did not follow

Table 1

Assessment of the Substitution and Complementarity Effect in Italian Trade. An Analysis Based on the Ratio of the Laspeyres over the Paasche Indices

Major Merchandise Classes	Among These Classes, the Quota Has Risen of the Items Whose Relative Prices Have Declined (substitution)	Grown (complementarity)	Weight of the Class in 1929
Export Totals	1922-36	1937-38	100.0
SITC			
0. Agricultural products	1922-26	1930-38	26.5
0.4 cereals	1922-26		4.5
0.5 fruits		1930-36	13.7
1. Beverages and tobacco	1922-25	1931-33	2.5
5. + 6. + 8. + 9. Various manufactured	1922-28, 1931-38		56.5
6.5 textiles	1922-28, 1931, 1934-38	1932-33	39.5
7. Mechanical products	1922-27	1934-38	6.0
7.1 mech. products less ships	1922-28, 1930-38		1.5
ISTAT			
Semi-manufactured products	1922-28	1931-38	21.6
Manufactured products	1922-26, 1932-38		42.0
Import Totals	1922-28	1930-38	100.0
SITC			
0. Agricultural products	1937-38	1922-36	22.8
3. + 4. Fuels, fats and lubric.	1922-29	1930-38	12.4
5. + 6. + 8. + 9. Various manufactured	1922-28, 1936-38	1930-35	28.7
7. Mechanical products	1922-24, 1928-32 1937-38	1925-27, 1933-36	5.8
ISTAT			
Raw materials	1922-28	1930-38	37.7
Semi-manufactured products	1922-28	1930-38	20.9
Manufactured products	1923, 1926-31, 1935	1932-34, 1936-38	19.4

Source: Table A.1.

demand but we exported what we had at declining prices (Table 1).

On the contrary, in the 1930s, we had a shift in the export composition towards the commodities that grew relatively in price: *Fruits and vegetables* (SITC 0.5). Fruits and vegetables were two of the few commodities whose relative prices decreased less in the 1930s and one of the few of our exports to show a positive correlation between relative price and relative quantity in those years. This relation, together with the rapidly-increased consumption per capita in the more industrialized European countries, suggests that there were large increases in the demand for relatively rich agricultural products. Italian consumption was low in the 1930s as the result of a depressed domestic living standard, and those goods which were not consumed in the country were exported only when they had favorable terms of trade.[18]

In the 1930s, agriculture was the item within Italian merchandise trade that had the best terms of trade and showed the highest capacity to pay for general use quantity imports,[19] as we can see from Figure 3. In our view, this favorable result had not been thoroughly planned for, but looks more like a residual item from the Fascist policy of "ruralità" and from the depressed domestic economic situation.

A movement in the same direction, but not so clearly defined, is visible also in the SITC 1. category, *Beverages and tobacco*, and we think the explanation can be given roughly on the same lines as before.

The higher quantities of agricultural goods exported were acknowledged by Antonio Fossati but he views them as a consequence of their declining prices: this is contradicted by our results on the goods relative terms of trade of Italian agriculture.[20]

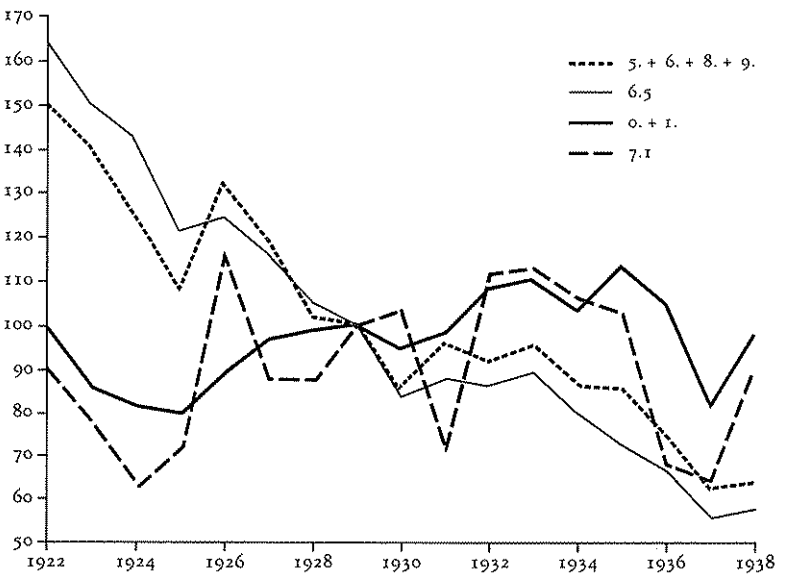
The SITC bundle 5. + 6. + 8. + 9. includes all manufactured goods except for mechanical products, fuels, fats and derived components. The ratio LA/PA > 1 in the 1920s points to a constant tendency for Italian exports to concentrate on items of falling relative prices. The most important item of the bundle is *Textiles* (SITC 6.5): the shift in composition towards cheaper textile products is widely documented and reflects the declining importance of natural silk exports and the growing importance of the artificial silk components characterised by a lower value. The same problem appears in the terminal years of the series where the trade data register an upswing in textile exports in comparison to the depressed situation of the 1930s, due to the partial removal of the previous rigid exchange control regulations (Table 1). The textile sector took particular advantage of the new rules and returned to selling abroad at cheaper prices in order to

allow the foreign exchange to be able to import the raw materials it needed; the European and American markets were heavily protected and Italy had to concentrate exports on its range of low-quality, semi-finished products.[21] The same path was followed by mechanical exports, although the general result is blurred by the inclusion of exported ships in the SITC 7. category: in the 1930s, the sale of Italian ships was organised for political reasons. In addition, the measuring of the quantity sold according to the ship's tonnage is not quite acceptable and the behavior of their unit value hardly resembles that of a price.

Fuel is certainly one of the most important items for an economy poor in raw materials. Italy seems to have taken advantage of a shift in relative prices in the fuel sector, in favour of fuel oil rather then coal: the relative unit value of imports of oil sharply declined from 1922 to 1935, parallel with its increased relative importance in Italian imports. The late 1930s present a reverse scenario and Italy had to pay a higher relative price for the fuel oil imported, particularly during the Ethiopian conquest (1936-38). In Table 1 we see a ratio LA/PA > 1 from 1922 to 1929 (substitution effect in favour of fuel oil) while in the late 1930s the same sign of the index has the opposite meaning (with respect to the index with the 1929 base) and points to a high complementarity due to the purchase of higher oil quantities at increasing values, requested particularly by the Army.[22]

Figure 3

Import Capacity of Some SITC Export Categories. Index Numbers, 1929 = 100



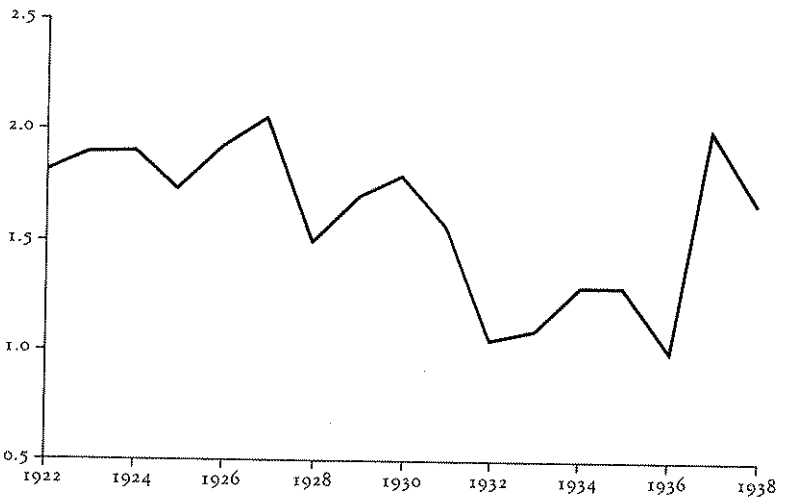
Sources: Appendix, Tables A.1 and A.2. Import capacity is defined in note 19.

Of course the total value of fuel imported could not be reduced very much by a country poor in coal and without oil fields, as Figure 4 shows; apart from the depression and the sanctions years, the propensity import for fuel over national income stayed at an average of 1.7 and, in the late 1930s, claims of fuel shortages were a recurrent theme in Ministro Felice Guarneri's Memoires.[23]

The most spectacular range in our LA/PA ratio is to be found on the import side, in manufactured goods, where the Laspeyres index reaches a level double that of the Paasche in 1922 and in 1923. This of course means that a strong substitution effect has taken place and it can be traced to mechanical products. We know the importance of the upswing in the manufacturing sector in the early 1920s and this recovery was based also on home-produced mechanical apparatus, like machines for the textile industry.[24]

Figure 4

Percentage of Expenditure for Imported Fuel over National Income in Italy (Reddito nazionale lordo ai p.m.)



Sources: *Movimento commerciale, Commercio di importazione e di esportazione, Reddito nazionale*, Table 36.

Italy probably benefited far less from the process of substitution in imports than from specialising her manufactured exports in items with a declining price; as a result the terms of trade of the manufactured side of the Italian merchandise balance declined very sharply in the 1920s, from 200 in 1922 to 100 in 1929 (Table A.1). In the 1930s the "autarchia nazionale" produced, as expected, a substitution effect with a great reduction in the manufactured goods imported that was frequently emphasised by the economic literature of the time. Nevertheless such a statement needs to be qualified. The reduction in imported manufactured goods is common to many semi-industrial European nations; in Italy it was greatly helped by the decrease in the living standards and was made possible by the enforcement of a strict exchange control system. Nevertheless, on the whole, the reduction in the value quota of the manufactured goods exported was very similar to that in the manufactured goods imported.[25] In addition the Italians sold relatively cheap goods and bought expensive goods, as evident for the terms of trade of the two classes *Mechanical items* (SITC 7.1) and *Various manufactured products* (SITC 5. + 6. + 8. + 9.):[26] this is further evidence of the dependence of the economy on some crucial products. In the end the limits of the import substitution process became very clear with the recovery of the economy and the African war: the rise in demand required a sharp growth in the quantities of mechanical goods imported. We see it clearly in Table 1 from the higher value of the Laspeyres index over the Paasche in 1933-36 (complementarity effect).[27]

Our critical evaluation of the "autarchia nazionale" is confirmed when we look at the import side of the trade balance, using the ISTAT classification, which is made according to the degree of transformation of manufactured products: for the 1920s a general process of substitution prevails with the increase, in the long run, of the quota of finished goods, while in the 1930s a complementarity effect appears more clearly, due to the purchase of higher quantities of the relatively more expensive goods (Table 1). The dependence on foreign suppliers in terms of purchases of raw materials and of advanced manufactured goods seems not to have been weakened by the "autarchia nazionale."

Another aspect of the same problem is the decreased import capacity of the exported manufactured items (Figure 3), again a consequence of the poor capacity of the Italian self-sufficiency program to begin working effectively.

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[1] The Standard International Trade Classification is presented in United Nations, Statistical Papers, series M, n. 38/rev., *Commodity Indexes for the Standard Industrial Trade Classification*, Rev. 2 (New York, 1981). Of course working out the same classification for the interwar period has required a great deal of adaptation.

[2] Each year index for a period t based on period t−1 is defined, on the basis of the Laspeyres formula, as $I_{t-1,t} = \frac{\Sigma_i p_t q_{t-1}}{\Sigma_i p_{t-1} q_{t-1}}$, $I_{t,t+1} = \frac{\Sigma_i p_{t+1} q_t}{\Sigma_i p_t q_t}$. Consumer price indices are sometimes chain indices, but the quantity weights are usually kept fixed for various years. For the entire definition problem we refer to T. Yamane, *Statistics. An Introductory Analysis* (2nd ed., New York, 1970), chap. 2, p. 265 ff.

[3] This is explained in the following note 12.

[4] I have dealt with this problem elsewhere, F. Giavazzi and G. Tattara, "Due studi sulla costruzione e l'impiego di nuove serie dei valori unitari all'importazione e all'esportazione," *Note economiche*, 3 (1983), pp. 30-48.

[5] Ministero delle finanze, *Movimento commerciale del Regno d'Italia nell'anno...*, annual (briefly *Movimento commerciale*), up to 1933; Istituto centrale di statistica del Regno d'Italia, *Commercio di importazione e di esportazione nell'anno...*, annual (briefly *Commercio di importazione e di esportazione*).

[6] A. Capanna and O. Messori, *Gli scambi commerciali dell'Italia con l'estero*, Conf. fasc. lavor. commercio (Rome, 1940), part 2. I dealt with the same problem in "Natura e significato delle statistiche sul commercio estero italiano, 1922-1931," in A. Lazzarini, ed., *Economia e società nella storia dell'Italia contemporanea* (Rome, 1983).

[7] I. Kravis and R. Lipsey raised the question of the inability of unit values of import and export to represent prices of imported and exported goods. They claim that domestic prices would be a better approximation to the latter; I. Kravis and R. E. Lipsey, *Price Competitiveness in International Trade* (New York, 1977).

[8] As defined in the preceding note 2.

[9] The terms of trade index is defined in Figure 1, Source.

[10] I have already examined the ISTAT attempt to make the value of exports in the 1920s look less favorable to the national economy, so as to soften the criticism on the negative consequences of quota 90 on the Italian trade balance; see Tattara, "Natura e significato delle statistiche," pp. 205-13.

[11] The *Bollettino* and *Sommario* figures show a peak in the terms of trade in 1927 and not in 1926 as our data show; this supposes the unreasonable assumption that the exporters had kept high relative prices of exported goods and/or had imported at cheap prices during the one and half years after the revaluation of the lira. Our explanation is based on an attempt of the exporters to lower prices spontaneously so as to counteract the higher exchange rate. This is a view shared by Antonio Fossati, who did not, however, realize that it went against the official figures: see his "Il commercio estero italiano dal 1928 al 1938," *Rivista internazionale di scienze sociali*, series 3, 47 (July 1939), pp. 667-68.

[12] The Laspeyres quantity index in t with t + 1 as base year is $\frac{\Sigma_i p_{t+1} q_t}{\Sigma_i p_{t+1} q_{t+1}}$. The current value index is $\frac{\Sigma_i p_t q_t}{\Sigma_i p_{t+1} q_{t+1}}$. The current value index in t divided by the Laspeyres price index is $\frac{\Sigma_i p_t q_t}{\Sigma_i p_{t+1} q_{t+1}} / \frac{\Sigma_i p_t q_{t+1}}{\Sigma_i p_{t+1} q_{t+1}} = \frac{\Sigma_i p_t q_t}{\Sigma_i p_t q_{t+1}}$ which is the Paasche quantity index. The latter is higher than the Laspeyres quantity index defined as $\frac{\Sigma_i p_{t+1} q_t}{\Sigma_i p_{t+1} q_{t+1}}$ every time prices and quantities are positively correlated.

[13] As has been said, the reasons for the correction are not declared by ISTAT.

[14] The Ethiopian war started in October 1935 and in the first month "the boast was made that every request was met in triplicate and that expense was no object" (p. 67). Expenditures of the Italian government and the number of Italian workers in Ethiopia declined suddenly in the subsequent years, when the poor value of the conquest was realized (p. 109). References are in D. Mack Smith, *Mussolini's Roman Empire* (London, 1976).

[15] Our method follows the pioneering work by R. E. Lipsey, *Prices and Quantities Trends in the Foreign Trade of the United States* (Princeton, 1963).

[16] Strictly speaking we should have said "a substitution effect not overtaken by a positive income effect." Let us assume that the income effect is not influential on the ground that the larger demand both for imports and exports comes from firms and not from consumers.

[17] As far as the consumer is concerned we could also say that it reinforces the income effect or that the substitution effect is so small as to be overtaken by the income effect. See also previous note 16.

[18] I have put forward the same position in "La battaglia del grano," in G. Toniolo, ed., *L'economia italiana, 1861-1940* (Bari, 1978).

[19] Defined as the ratio between the unit value index number of the exported item and that of the general merchandise imports times × 100.

[20] Antonio Fossati acknowledges the good performance of the exported quantities of agricultural products, but attributes it to the supposed depressed export prices (as usual one sells more when prices decrease: a substitution effect), contradicting the available official figures. The Banca d'Italia correctly reports the good performance of agricultural exports values, positively correlated with the rise in the quantities exported, but makes no comment on the possible causes of it. See Banca d'Italia, *L'economia italiana nel sessennio 1931-36* (Rome, 1938), part 1, pp. 193-95.

[21] The shift in our export share towards more peripheral countries constitutes a long period tendency and is fairly clear from the trade data: the quota of Italian artificial textile exports taken up by the industrialized European countries (United Kingdom, Germany, France, Switzerland) and by the United States declined from 65 per cent in the late 1920s to 40 per cent in the late 1930s. From 1936 to 1938 the increase of the relative quantity of artificial silk sold to Italian Africa, British India and Mexico is relevant.

[22] The ratio of the unit value of the imported refined petrol (the most important item in the fuel oil category) and that of coal declined in the 1920s from 170 (1922-25) to 100 (1929), though it later increased from 100 (1935) to 114 (1938).

[23] Felice Guarneri was in charge of the "Ministero per gli scambi e per le valute" from 1935 to 1939. His memoires have been published in F. Guarneri, *Battaglie economiche tra le due grandi guerre* (Milan, 1953).

[24] The general data are in P. Ercolani, "Documentazione statistica di base," in G. Fuà, ed., *Lo sviluppo economico in Italia* (Milan, 1969). The upswing is acknowledged by the literature of the time, see for example G. Frisella Vella, "La politica doganale italiana nel dopoguerra," *La riforma sociale*, 39 (1928), pp. 34-51.

[25] The quota of the value of the manufactured imports and exports does not result from the SITC but from the ISTAT classification. They are reported in *Commercio estero*, various years.

[26] The decline in the terms of trade is not to be found in all merchandise classes: *Textiles* (SITC 6.5) do not show declining terms of trade over the 1920s. Refer also to previous Figure 3.

[27] The two indices have not really very different values in the 1930s. The maximum substitution effect took place in the 1920s.

Table A.1
Indices of Imports and Exports in Goods, 1922-38: Alternative Estimates

	Present Estimates				Previous Estimates: ISTAT *Bollettino*				Previous Estimates: ISTAT *Sommario*			
	Imports		Exports		Imports		Exports		Imports		Exports	
	A	B	A	B	A	B	A	B	A	B	A	B
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1922	99.2	91.8	132.2	52.9	–	–	–	–	105.3	70.1	110.0	56.6
1923	106.9	94.2	127.9	72.5	–	–	–	–	113.2	71.1	109.0	68.9
1924	112.0	82.7	124.8	92.7	–	–	–	–	123.5	73.6	111.1	87.0
1925	137.8	92.2	139.9	102.7	139.9	89.2	138.0	87.0	144.1	85.3	131.0	93.9
1926	138.6	89.8	161.6	90.1	137.7	87.8	145.6	84.2	141.3	86.0	137.8	91.1
1927	110.7	86.7	117.7	91.0	110.8	86.1	116.9	87.8	116.8	81.9	114.3	92.0
1928	102.9	100.1	104.0	95.8	101.5	101.8	107.4	88.9	106.8	96.3	105.2	93.0
1929	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1930	89.4	89.8	82.8	110.2	86.5	92.5	83.7	95.1	86.9	93.7	83.5	98.5
1931	72.3	74.0	73.0	106.3	68.3	78.7	68.1	98.4	71.7	76.2	69.9	98.9
1932	58.8	66.1	61.4	75.2	53.5	71.3	56.4	79.2	58.3	66.6	59.1	78.0
1933	52.4	64.7	56.2	75.1	48.2	71.2	49.5	79.5	52.0	67.1	50.9	79.7
1934	52.2	71.8	55.1	70.1	46.6	76.1	45.5	73.5	50.6	71.2	46.3	76.7
1935	52.2	72.1	54.2	65.3	48.6	73.9	45.6	73.5	53.5	68.3	49.6	73.1
1936	61.7	47.6	57.7	60.8	59.1	47.1	51.4	70.7	64.8	43.7	57.0	65.9
1937	97.2	63.4	75.0	88.1	92.1	69.3	65.0	105.2	100.5	65.1	74.5	97.8
1938	89.3	53.2	73.5	85.9	87.6	58.6	66.6	102.3	96.4	54.9	79.5	89.4

A = Unit value. B = Quantity.

Sources: *Movimento commerciale, Commercio di importazione e di esportazione, Bollettino*, various years, *Sommario*. The Present Estimates are Laspeyres indices.

Table A.2
Unit Value Laspeyres Indices of Imports and Exports in Goods, 1922-38. SITC Main Subcomponents

	Imports						Exports					
	SITC Main Categories											
	0. + 1.	2. + 4.	3.	5. + 6. + 8. + 9.	7.1	6.5	0. + 1.	2. + 4.	3	5. + 6. + 8. + 9.	7.1	6.5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1922	108.0	99.3	138.3	78.7	78.5	92.9	99.9	99.2	189.4	149.6	89.3	171.3
1923	102.0	115.8	144.6	90.3	88.0	94.9	92.2	101.8	162.0	148.4	83.3	162.0
1924	107.2	127.1	125.4	101.7	98.0	110.2	91.6	122.8	157.8	140.3	71.3	161.6
1925	142.7	158.7	141.4	123.5	110.6	128.0	110.1	137.4	160.6	149.9	101.4	167.9
1926	140.0	143.7	171.3	128.0	112.0	121.5	123.5	134.3	171.1	184.4	163.8	172.8
1927	115.4	105.4	137.9	106.4	103.9	109.7	107.4	111.9	142.9	123.9	96.3	129.7
1928	103.4	105.9	105.1	100.9	97.1	100.2	101.8	106.2	109.9	104.9	89.9	107.9
1929	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1930	90.7	78.6	106.5	84.3	98.1	97.4	85.4	85.7	90.4	78.2	93.5	75.2
1931	69.4	56.1	90.7	71.5	92.7	82.3	71.6	65.8	78.1	69.7	51.9	63.9
1932	57.1	43.6	62.4	64.4	82.4	60.1	64.2	65.1	67.8	54.8	66.4	51.4
1933	51.3	40.9	54.6	55.0	74.6	46.9	57.7	63.9	55.8	50.1	59.5	46.8
1934	45.7	42.8	51.7	60.4	73.2	43.6	53.8	56.9	35.0	45.3	55.8	41.8
1935	48.5	48.2	54.3	45.8	84.2	37.8	59.4	62.6	47.6	44.8	54.1	38.4
1936	55.7	56.6	66.0	57.3	127.2	45.3	65.0	77.1	48.2	46.4	42.7	41.7
1937	96.3	89.7	108.4	87.7	144.3	59.9	80.2	110.7	38.4	62.1	62.4	55.2
1938	72.9	75.4	114.6	84.3	161.9	75.2	88.9	93.1	35.6	58.9	81.5	52.1

Sources: as in Table A.1.

Table A.3
Quantity Laspeyres Indices of Imports and Exports in Goods, 1922-38. SITC Main Subcomponents

	Imports						Exports					
	SITC Main Categories											
	0. + 1.	2. + 4.	3.	5. + 6. + 8. + 9.	7.1	6.5	0. + 1.	2. + 4.	3	5. + 6. + 8. + 9.	7.1	6.5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1922	106.6	61.6	68.9	119.3	96.8	114.8	64.8	79.3	42.2	50.5	75.2	42.4
1923	107.7	64.7	68.5	123.8	84.7	111.2	76.7	95.2	40.7	62.9	120.7	57.1
1924	94.2	76.1	82.8	79.2	95.1	97.9	120.6	99.6	53.3	80.7	100.4	66.7
1925	91.7	86.4	81.6	93.0	124.0	96.2	116.5	95.9	58.3	98.4	119.5	79.6
1926	91.8	89.1	77.0	87.3	118.8	88.7	106.6	94.1	67.9	80.8	90.4	75.9
1927	96.4	82.8	89.2	82.1	85.8	74.3	100.5	111.3	67.4	82.6	84.6	81.4
1928	120.5	94.4	82.2	99.3	97.5	100.5	93.7	95.8	74.4	95.9	126.1	91.8
1929	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1930	104.0	90.7	97.8	83.1	88.9	90.6	101.2	94.2	32.6	127.0	109.5	102.9
1931	92.3	81.1	91.0	65.2	57.7	68.8	111.4	86.1	30.6	113.8	138.4	86.7
1932	77.7	82.9	84.6	58.3	48.6	60.0	95.0	65.7	32.9	68.9	73.6	69.9
1933	49.8	95.9	96.2	61.8	58.8	70.0	101.4	64.5	30.4	65.4	67.8	65.7
1934	56.8	96.9	118.4	59.7	61.3	72.2	91.7	64.9	31.5	62.4	88.7	61.6
1935	55.1	86.7	134.1	63.9	53.9	94.8	88.3	51.0	40.0	57.1	179.8[a]	54.2
1936	36.5	51.3	89.8	41.5	44.0	64.5	90.4	38.8	38.5	46.6	305.3[a]	45.2
1937	52.4	78.3	122.4	50.2	48.6	64.6	106.2	64.1	115.1	78.6	354.7[a]	81.3
1938	37.2	71.7	112.6	35.2	39.5	19.0	100.3	58.5	125.8	80.2	230.3[a]	84.3

[a] Due to exceptional sales of vehicles to Italian African territories.

Sources: as in Table A.1.

Table A.4
Unit Value and Quantity Paasche Indices of Imports and Exports in Goods, 1922-38

	Imports		Exports	
	Quantity (1)	Unit Value (2)	Quantity (3)	Unit Value (4)
1922	75.3	81.4	47.2	109.8
1923	76.1	86.4	58.2	103.0
1924	81.9	110.9	77.9	104.8
1925	90.0	134.5	88.0	119.9
1926	88.3	136.3	81.8	147.3
1927	87.1	111.2	89.2	115.5
1928	100.5	103.3	94.1	102.7
1929	100.0	100.0	100.0	100.0
1930	91.1	90.6	100.9	76.4
1931	75.6	73.8	96.6	66.7
1932	66.6	59.2	74.2	61.2
1933	66.4	51.6	70.9	53.4
1934	69.2	50.3	62.9	50.1
1935	70.8	51.3	62.0	52.3
1936	46.9	60.8	62.7	60.2
1937	67.8	104.0	91.5	79.5
1938	58.9	98.9	92.7	80.3

Sources: as in Table A.1.