

The Valuation of Commodities for Direct Consumption

by
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The valuation of commodities consumed by the producers themselves offers some difficulties that puzzle statisticians in periods when prices on the free market differ widely from the legal prices.

Some would value these commodities at their legal price, others at the free market price, and others again would accept a weighted average between these two. But in making this weighting is difficult to find a criterion which would not be arbitrary.

In my opinion the solution should be sought in a quite different direction. It is extremely simple. It may seem to be the egg of Columbus.

Commodities consumed by the producers themselves are generally fungible commodities of a fixed type, whose quality does not vary appreciably from one period to another, so that their valuation may be made to depend exclusively on their quantity and on the purchasing power of the currency.

Let the current price of the product consumed by the producer himself be known for a period taken as a base in which the legal price did not differ from the market price, and let the quantities consumed be also known both in the base period and in the period for which the valuation is to be made. The variation in the quantity can then be ascertained directly. As concerns the variation in the purchasing power of the currency, it must evidently be deduced not from the legal price, nor from the free market price of the special product under consideration, but from the index number for the general price level. It is of course presumed that this index number has been determined in a suitable manner, attributing to the several commodities the weight corresponding to the quantity exchanged or to the quantity — gross or net — produced or to the ex-

isting quantity, the choice of one or other depending on whether the valuation is to be used for calculating the amount of exchanges, or of production, or of incomes, or of wealth.

The soundness of this mode of procedure may be tested in the following manner. Let us suppose that the volume of all commodities has remained steady from the base period to the period under consideration. The variation of the value of the commodities exchanged, produced or existing will correspond in this case to the variation in the index of the general price level. But this index-number can only be determined by taking into consideration the commodities that are not consumed directly by the producers themselves. Now, to apply to all commodities the index number of the general price level which has been established for commodities not the objects of direct consumption, amounts to the same thing as attributing to the commodities which are the objects of direct consumption the same price variations that are deduced from the index for the general price level.

Let us now see another proof. The general price index number must be such that if we multiply by it all the prices of the base period, we shall obtain for the period considered, the same total amount as is obtained by assigning to the several commodities their own prices. Now this equivalence occurs when, and only when, a price is assigned to commodities consumed directly by the producers which is increased over the price of the base period in the same ratio shown by the index number for the general price level.

It should be noted that this mode of procedure is not always equivalent to taking an average between the legal price and the free market price. Thus, for instance, in Italy the price

index number in 1947-48 (100=1938 prices) was 5,159 for the general level of wholesale prices, while in the case of wheat it stood at 3,259, in that of maize at 4,023, for barley at 3,421, for rye at 3,549, if we consider the legal prices, but at 8,872, 8,319, 4,860 and 8,733 respectively if we consider the prices on the free market. Therefore the index number for the general level of wholesale prices stood between the index numbers for legal prices and free market prices in the case of wheat, maize, and rye, but not in the case of barley, for which it was higher than either.

Let us see how it is possible in practice, following the method described, to estimate the value of the quantities of the aforesaid commodities produced in Italy in 1947 and consumed by the producers themselves.

The quantities consumed directly by the producers are given in column 2 of the following table (Table I). The data in that column have been kindly supplied me by the Central Institute of Statistics. They are approximate and therefore susceptible of corrections but this is of no importance for the purposes of this calculation which is merely illustrative. In column 3 are stated the prices per quintal in 1938, columns 5 and 6 contain the index numbers of the legal prices and of the free market prices for the four products in 1947-48 taking 100 as the price, already stated in column 3, for the respective product in 1938, while column 4 shows the index numbers for the general level of wholesale prices also taking 100 as the general price level in 1938. Lastly, in columns 7, 8 and 9 are shown the estimated value in millions of lire for the several pro-

ducts, and for their total, calculated on the basis of the quantities stated in column 2 at the prices of the base year given in column 3, and of the index numbers given in columns 4, 5 and 6. Thus, for instance, to obtain the estimated value of wheat consumed by the producers themselves in 1947-48 at the legal prices we shall multiply the quantity consumed as stated in column 2 (22,000) by the price stated in column 3 (131) by the index number given in column 5 (3,259). We shall obtain the result $22,000 \times 131 \times 3,259 = 9,392,438,000$, which divided by 100 (the base of the index number in 1938) and multiplied for 1,000 (the unit in which the quantities consumed are expressed) will give us the value sought for in Lire 93,924,386,000. This is found, expressed in millions of lire, in the first line of column 8.

Another method to which one can have recourse is that of valuing the quantities consumed by the producer at an average price between the legal and the free market price. The criterion by which the average is to be determined has then to be decided on.

Among the criteria which may be considered there is that of assigning to the index number of the legal prices and to the index number of the free market prices a weight proportionate to the quantities delivered to the pools and respectively to the quantities sold on the free market. It is difficult to justify this method on theoretical grounds, but it deserves to be taken into consideration in as much as it is based on an objective criterion.

Table II shows in column 2 the quantities delivered to the pool; in column 3 the quantities received on the free market; in column 4

TABLE I

Product	Quantity consumed by producers themselves 1947-48 1,000 qls.	Price per ql. in 1938	Index number in 1947-48 (1938=100) of			Estimated value in millions of lire of quantities consumed by producers themselves in 1947-48 according to base price of 1938 and the index number of		
			wholesale price level	legal prices	free market prices	wholesale price level	legal prices	free market prices
Wheat	22,000	131	5,159	3,259	8,872	148,682	93,924	255,691
Maize	8,322	87	5,159	4,023	8,319	37,352	29,127	60,202
Barley	900	98	5,159	3,421	4,860	4,550	3,017	4,287
Rye	573	113	5,159	3,549	8,733	3,340	2,295	5,635
Total	—	—	5,159	—	—	193,924	128,363	325,835

the weighted average, based on these quantities, of the respective index numbers of the prices already given in the previous table (Table I, columns 5 and 6) and, lastly, in column 5, the values obtained by multiplying the average index numbers thus obtained by the prices of the base period (Table I, column 3), and for the quantities consumed by the producers themselves (Table I, column 2).

obtained on the basis of the legal prices (128 milliards, see Table I, column 8) and is inferior by 132 milliards to that obtained on the basis of the free market prices (326 milliards, see Table I, column 9).

Calculating the weighted average of the two index numbers for the several products on the basis of their respective quantities, we obtain results (Table II, column 5) for them that differ

TABLE II

Product	Quantity delivered to the pool, 1947-1948 (1,000 q's)	Quantity on free market 1947-48 (1,000 q's)	Average of index numbers of legal prices and free market prices weighted on basis of quantity (2) and (3)	Estimated value in millions of lire of quantities consumed by producers themselves in 1947-48 according to the base price in 1933 and index number (4)
(1)	(2)	(3)	(4)	(5)
Wheat	11,112	5,675	5,156	148,595
Maize	1,767	8,174	5,911	42,796
Barley	249	223	4,101	3,617
Rye	125	37	4,733	3,064
Total	—	—	—	198,072

The method we suggest, while in the case of the several products it does not always give results intermediary to those obtained on the basis of the legal prices and the free market prices, does however give for the four products considered as a whole a result (194 milliards, see Table I, column 7) which is intermediary, as it exceeds by 66 milliards the result

sometimes considerably from the results obtained by the method we have described, but which, taken as a whole, are pretty much the same, as they give a total of 198 milliards instead of 194. Very probably however this is only a chance coincidence which might not occur again for other countries or for Italy herself in other years.