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EDITED BY

Luigi L. Pasinetti

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ITALIAN ECONOMIC PAPERS

Volume I

Edited by
Luigi L. Pasinetti

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Giorgio Fuà

DECLINE OF AGRICULTURE AND ENGEL'S LAW IN THE ITALIAN EXPERIENCE*

1. *The relative decline in demand for agricultural product and its effects on employment and incomes*

The association of increasing real per capita product with a declining percentage of agricultural product is one of the most common findings of research into «modern economic growth»¹. Here I shall examine how this association has developed in Italy.

In the seventy-year period between 1897 and 1967, when real gross domestic product per inhabitant in Italy more than quadrupled, the share of agricultural product declined from 48 per cent to 12 per cent².

Table 1, row *a*, shows that the decline was slight in the first of the three periods of peacetime development (the «Giolitti» period, 1897-1913) and very marked in the other two (the «Fascist» period, 1921-1938, and the «Republican» period, 1949-1967).

Conversely, during the two periods when the Italian economy was affected by the two World Wars, and when the net increase in real per capita output was very low (see row *g* of Table 1), the declining trend in the share of agricultural product either reversed direction (1913-1921) or halted (1938-1949).

Row *b* of Table 1 shows that the pattern for employment was much the same. The share of agriculture in total employment diminished moderately during the Giolitti period and sharply during the Fascist and Republican periods. In war years this trend reversed (1913-1921) or attenuated (1938-1949).

This paper was originally published in Italian as «Declino dell'agricoltura e legge di Engel nell'esperienza italiana», in Moneta e Credito, n. 107, 1974, pp. 261-269; translated by the author.

* I wish to thank M. Crivellini, P. Ercolani and P. Pettenati for their criticisms and suggestions.

¹ I use this term in the sense given to it by S. Kuznets (1966), *Modern Economic Growth*, New Haven.

² This share refers to GDP at factor cost and current prices.

The ratio between the above two shares – of product and of employment – is identical to the ratio between product per worker in agriculture and product per worker in the economy as a whole. This ratio is calculated in row *c* of Table 1, which shows that in 1897 product per worker in agriculture was already below the average of the overall economy, and that the gap widened markedly during the seventy-year period that followed. The process took place entirely during periods of peacetime development and mostly during the Fascist period.

This widening in the relative income gap between agriculture and the economy as a whole may have been due to the worsening of the relative income gap between agriculture and non-agricultural sectors and/or to the increase in the relative weight of agricultural employment in total employment. This latter fact would be sufficient to aggravate the inferiority of income per worker in agriculture relative to the overall average (agricultural workers included) even if the income inferiority of agricultural workers with respect to non-agricultural workers remained unchanged.

This is an interesting distinction, and row *d* of Table 1 shows the relative income per agricultural worker compared with other sectors. As in row *c*, here too we find that the inferiority of agriculture, already considerable in 1897, tended to worsen the gap widened significantly not only during the Fascist Period but also during World War I. After the brief interval of World War II, however, there was a distinct reversal in the trend.

Rows *e* and *f* of Table 1 show the roles played, respectively, by productivity and prices in determining the trend in relative income. During the Giolitti period agriculture lost very little vis-à-vis the other sectors in terms of both productivity and prices. The four periods that follow, though, display a regularly alternating pattern: in war years agriculture lost ground in productivity and gained on prices³; in peacetime, agriculture made gains in productivity and losses in terms of prices. But whereas in the case of prices these were fluctuations around an underlying trend that was constantly negative, in the case of productivity the basic trend was only negative at the outset and positive thereafter. In other words, while the drop in relative productivity during World War I was only partially recovered in the Fascist period, the drop in productivity during World War II was more than made up during the Republican period.

³ The fluctuation of relative prices in wartime is even more marked than appears from the table, because in 1921 and 1949 the downturn had already started. Note that the fluctuation concerns not so much the ratio between agricultural prices and industrial prices as the ratio between commodity prices (both agricultural and industrial), on the one hand, and the prices of services on the other.

2. Factors in the relative decline in demand for agricultural product

It is often stated that the main explanation for the phenomenon presently under examination is Engel's Law, or rather the tendency for the percentage of income spent on food to diminish as income per head increases. However, the fact that the ratio between value added in agriculture and food consumption also tends to diminish with growth is no less important.

Table 2 shows the influence of these two factors in the Italian case. During the Giolitti period the slight reduction in the ratio between value added in agriculture and gross domestic product was mainly due to the reduced ratio between food consumption and GDP. This is also true of the marked decrease that occurred during the Fascist period.

However, the major reduction during the Republican period was caused more by changes in the ratio between value added in agriculture and food consumption than by changes in the ratio between food consumption and GDP.

When we consider the entire seventy-year period 1897-1967, the two factors appear to have been of roughly equal significance. The ratio between food consumption and GDP and the ratio between value added in agriculture and food consumption were both practically halved, and this caused the above reduction in the ratio between value added in agriculture and GDP to a quarter of its initial value.

We may now take the analysis a step further by decomposing each of the above two ratios. Table 3 breaks down the ratio between food consumption and GDP into three factors:

a) the relative share of total private consumption spent on food, which according to Engel's Law tends to decrease as the level of per capita consumption rises;

b) the relative share of disposable income spent on consumption, which according to what we may call «Keynes' Law» tends to decrease as the level of disposable income per head increases;

c) the ratio between disposable private income and GDP at factor cost, which may change because the relative magnitude of net direct taxation and/or of net incomes and transfers from the rest of the world varies with respect to GDP.

The effect of Engel's Law was negligible during the Giolitti period⁴ but stronger (and strikingly more important than the other two factors) during the Fascist period, the Republican period, and the seventy-year period taken

⁴ A suggested interpretation of this fact is given by P. Pettenati (1974), «Alcune relazioni tra i consumi e lo sviluppo», in G. Fuà (ed.), *Lo Sviluppo economico in Italia*, vol. 2, Milan, 2nd ed., 1974. Cfr. especially pp. 324-335.

as a whole. Keynes' Law was the only one of the three factors that brought significant variations during the Giolitti period, whereas it was of secondary importance during the Fascist and Republican periods. Finally, changes in direct taxation and in net incomes and transfers from the rest of the world were an important factor in reducing the ratio between food consumption and GDP during the Fascist period, but of little influence at other times.

Table 4 gives a similar decomposition of the ratio between value added in agriculture and food consumption. There are four factors here:

a) the relative share of the total value of the products supplied by agriculture («gross output») which is made up of value added in agriculture itself, as opposed to the cost of inputs purchased by agriculture from other sectors⁵;

b) the ratio between total gross agricultural output (including non-food-stuffs like textile fibres, wood, etc.) and the part of it consisting of food-stuffs;

c) the ratio between Italian production of agricultural foodstuffs (including exports) and Italian consumption of agricultural foodstuffs (including imports);

d) the relative share of total expenditure on food consumption which is accounted for by agricultural foodstuffs (valued at farm prices) rather than by industrial processing, transport, distribution, and net indirect taxation.

The measurements given in the table are of varying degrees of approximation. Those regarding factor *a)* are based on acceptably accurate statistics, whereas for *b)*, *c)* and *d)* I have had to rely on rough estimates. Nevertheless the following features emerge with sufficient clarity.

The steep decline between 1921 and 1967 in the ratio between value added in agriculture and food consumption was essentially due to reductions in ratios *a)* and *d)*. That is, it was due to the fact that the food production process increasingly involved activities upstream (production of fertilizers, energy sources, etc.) and downstream (food processing industries, etc.) of the activity defined as «agriculture». Of the two factors, *d)* – that is, the effect of downstream activities – predominated.

Ratio *b)*, however, was generally stable, because the relative decline of certain kinds of non-food agricultural products (firewood, for example) was offset by the relative expansion of some others (pulpwood, for example).

Finally, ratio *c)* – which may be taken as an imprecise but suggestive in-

⁵ For the sake of precision, subsidies to producers should also be considered. These subsidies are not counted in the value of gross output but are included in value added instead. The exact difference between gross output and value added is not the inputs purchased by agriculture from other sectors, but of such inputs minus subsidies. This latter item was of negligible proportions before 1949, after which date it increased until it amounted to 2 per cent of gross output in 1967.

indicator of Italy's degree of food self-sufficiency – followed an oscillating course, with a downturn at the end of World War I, then a recovery, and then another downturn in more recent years. The present value (1973) is even lower than that for 1967 given in the table. However, we should not necessarily assume that this ratio too is now starting on a declining trend which will persist over the long term. Much will depend on the policy adopted, and it seems quite probable that a policy able to bring Italy back to approximate self-sufficiency will eventually prevail⁶.

3. An interpretative scheme

The Italian experience can be represented by a model which seems largely applicable to other countries as well.

During the various phases of modern economic growth to date, increases in labour productivity and in real per capita income have been associated with a shift in demand favouring non-agricultural sectors.

Two kinds of mechanisms have been chiefly responsible for this shift in demand.

First, the rise in average income has led to a change in the allocation of expenditure, favouring gross investment and non-food consumption at the expense of food consumption.

Second, increasing productivity has resulted from changes in the productive structure. Some of these changes have involved lengthening the chain of processes leading up to the final food product (increased «roundaboutness») by dividing it among various activities (increased division of labour), thus leaving agricultural activity with an ever-decreasing fraction of the food-production chain.

The former of these mechanisms predominated during an early phase of modern economic growth (which in Italy ended with the Fascist period); the second has predominated in a later phase (through which Italy is still passing).

In some cases, a third kind of mechanism has been at work. This concerns the international division of labour: a country relatively poor in land tends to become a net importer of agricultural products and a net exporter of non-agricultural products.

⁶ In this section I have restricted myself to calculations at current prices. It would be interesting to further decompose each ratio into the price factor and the quantity factor, but – besides being cumbersome for the reader – this would involve risky estimates. I would mention, however, that on preliminary inspection the price factor acted mainly on ratios *d* and *a* in Table 4 (in the case of both ratios, there was a variation in relative prices detrimental to agriculture).

The past history of Britain provides the most conspicuous example of this tendency operating to its fullest extent. On the other hand, however, there are numerous cases of countries intervening to limit its action through policies for the protection and support of agriculture.

While various mechanisms (two systematic and one erratic) have shifted demand from the agricultural sector towards the non-agricultural sector, a set of constraints has limited the speed with which the productive structure has been able to adapt.

The first of these constraints regards entrepreneurial forces (enterprise skills, organizational and technical structures, capital). These develop only gradually, and in the early stages of modern economic growth one could not expect any major transfer of such forces from agriculture (where enterprises are still pre-modern) to other activities.

The second constraint regards the mobility of labour supply. The flow of agricultural labour to non-agricultural jobs is limited by the barriers that – in the early stages of modern economic growth – still divide the rural from the urban world: geographical distance, cultural differences, and in some cases corporative restrictions.

These two constraints – or rather the one that happens to be more stringent at any particular time – set an upper limit on the speed with which the productive structure can evolve. In the early stages of modern economic growth this limit was generally lower than the speed at which demand was shifting. This therefore gave rise to a relatively short supply («sellers' market») of non-agricultural products and a relative redundancy («buyers' market») of agricultural products, and hence to a declining trend in the terms of trade of agriculture⁷.

This situation has also had repercussions on employment and on productivity. The surplus supply of manpower stagnating in agriculture discourages labour-saving investment, and finds an outlet in low-yield farming practices, including those conventionally described as «disguised unemployment». All this is made easier by the organizational structure prevailing in agriculture. For example, on peasant farms the children of the household are almost au-

⁷ Various writers have imputed the decline in the terms of trade of agriculture to the market structure – *i.e.* to the fact that the supply of agricultural products takes place under competitive conditions while the supply of industrial products is increasingly oligopolistic in nature. There is no necessary conflict between this explanation and mine; indeed the two are complementary.

For more exhaustive explanation one should also examine the service sector: not only the non-competitive market structure that characterizes various service branches, but also the statistical conventions governing the calculation of price indices for government services and other important service activities. A proportion of the drop in agricultural prices relative to the rest of the economy can be imputed, in fact, to these conventions.

tomatically taken on as workers, whereas any industrial capitalist firm makes its calculations carefully before hiring manpower. As long as these mechanisms operate, we can expect labour productivity in agriculture to lag behind that of the non-agricultural sector. Thus we may have, paradoxically, changes of the same sign in relative prices and in relative productivities⁸.

We come, finally, to wages. As the above-mentioned barriers restrict the ability of the agricultural labour force to compete in the non-agricultural labour market, differentials may emerge between the wage levels in the two markets. In fact, non-agricultural workers manage to obtain an improvement in their relative position in terms of wages roughly in line with the relative position of their sector in terms of income produced per worker.

By way of summary, therefore, this mechanism works against agriculture as regards relative prices, labour productivity and therefore income produced per worker, and also as regards wage levels.

However, as time passes the picture changes. Eventually the development of entrepreneurial forces finally catches up with the evolution of demand. In the meantime, as industry and services spread, the number of points of contact between the rural and urban worlds increases, the lifestyle of industrial civilization extends throughout the entire economy, and barriers to the redistribution of the labour force between agriculture and non-agriculture activities begin to weaken. Finally, at same point, the gap between the productive structure and the structure of demand stops widening and begins to narrow. In Italy, this turning-point appears to have coincided with the Second World War. In more recent years, in fact, agriculture has begun to regain ground in terms of income produced per worker, thanks to a major improvement in physical productivity due mostly to a massive reduction in the employment share.

Although this concludes my analysis, I would make a further point to avoid the misinterpretation of my argument as favouring the current trend towards the depopulation of the Italian countryside, and as desire that such trend proceed as rapidly as possible.

One must first of all draw a distinction between a reduction in the proportion of the labour force tilling the land and a reduction in the proportion of the population residing in the countryside. Policies are available and, in my view, desirable which can achieve the first outcome (within suitable times and limits) without incurring the second.

Secondly, it should be borne in mind that the reduction in the proportion of the labour force employed in agriculture is beneficial only to the extent that the labour subtracted from agriculture is able to find effective em-

⁸ This is effectively the case in Italy if, abstracting from wartime fluctuations, we compare 1913 with 1938, or 1921 with 1949.

ployment in other, more productive activities. In recent Italian history these limits have been exceeded, and mass migration away from agriculture has caught up many workers (mainly elderly people and women) who could not hope, under present circumstances, to find work anywhere else and who have therefore joined the ranks of the unemployed. Thus the benefits revealed by an examination of the population currently employed – benefits brought by the closing gap in productivity and income between agricultural and non-agricultural workers – are counterbalanced by the losses incurred by another section of the population which has been deprived of its jobs. The figures in Table 1 clearly show these benefits, but not these losses.

TAB. 1. *Evolution of the Relative Position of Agriculture in the Course of Italian Economic Growth*

	1897	1913	1921	1938	1949	1967
Ratio between agriculture and the domestic economy as a whole:						
a) gross product at factor cost and current prices	0.48	0.42	0.43	0.27	0.27	0.12
b) number of persons employed	0.64	0.58	0.61	0.49	0.48	0.23
c) gross product per worker $\equiv a : b$	0.76	0.73	0.71	0.54	0.56	0.52
Ratio between agriculture and the non-agriculture sector:						
d) gross product per worker (current prices)	0.63	0.60	0.52	0.41	0.41	0.48
e) gross product per worker in real terms (1938 prices)	0.51	0.50	0.38	0.41	0.32	0.55
f) terms of trade (index of relative implicit prices; 1938 = 1) $\equiv d : e$	1.23	1.20	1.35	1.00	1.25	0.89
g) rate of growth of the Italian economy between the dates given (yearly % of GDP at constant prices per inhabitant)	2.0	0.3	1.3	0.4	4.3	

TAB. 2. *Ratio between Value Added in Agriculture, Food Consumption and GDP*

	Ratio						Index of ratio variation			
	1897	1913	1921	1938	1949	1967	1913/ 1897	1938/ 1921	1967/ 1949	1967/ 1897
a) Ratio between value added in agriculture and food consumption $\frac{Y_a}{C_{al}}$	0.79	0.78	0.76	0.68	0.62	0.37	0.98	0.90	0.60	0.47
b) Ratio between food consumption and GDP $\frac{C_{al}}{Y_g}$	0.61	0.54	0.56	0.39	0.43	0.33	0.89	0.70	0.76	0.54
c) Ratio between value added in agriculture and GDP $\frac{Y_a}{Y} = \frac{Y_a}{C_{al}} \cdot \frac{C_{al}}{Y}$	0.48	0.42	0.43	0.27	0.27	0.12	0.87	0.62	0.45	0.25

TAB. 3. *Breakdown of the Ratio between Food Consumption and GDP*

	Ratio						Index of ratio variation			
	1897	1913	1921	1938	1949	1967	1913/ 1897	1938/ 1921	1967/ 1949	1967/ 1897
a) Ratio between food consumption and total private consumption										
$\frac{C_{al}}{C}$	0.68	0.66	0.68	0.54	0.55	0.44	0.97	0.80	0.81	0.65
b) Ratio between private consumption and disposable income										
$\frac{C}{Y_d}$	0.90	0.82	0.83	0.78	0.82	0.78	0.90	0.95	0.95	0.86
c) Ratio between disposable income and GDP										
$\frac{Y_d}{Y}$	1.00	1.01	1.01	0.92	0.97	0.95	1.02	0.91	0.99	0.96
d) Ratio between food consumption and GDP										
$\frac{C_{al}}{Y} = \frac{C_{al}}{C} \cdot \frac{C}{Y_d} \cdot \frac{Y_d}{Y}$	0.61	0.54	0.56	0.39	0.43	0.33	0.89	0.70	0.76	0.54

TAB. 4. Breakdown of the Ratio between Value Added in Agriculture and Food Consumption

	Ratio						Index of ratio variation			
	1897	1913	1921	1938	1949	1967	1913/ 1897	1938/ 1921	1967/ 1949	1967/ 1897
a) Ratio between value added and gross output of agriculture $\frac{Y_a}{P}$	0.94	0.93	0.95	0.89	0.90	0.80	0.99	0.94	0.89	0.85
b) Ratio between gross output and the part of it destined for food $\frac{P}{P_{al}}$	1.1	1.1	1.1	1.1	1.1	1.07	}			
c) Ratio between Italian production and Italian consumption of agricultural foodstuffs $\frac{P_{al}}{P^*_{al}}$	1.0	1.0	0.9	1.0	1.0	0.95				
d) Ratio between the value of agricultural products used for food and the total value of food consumption $\frac{P^*_{al}}{C_{al}}$	0.8	0.8	0.8	0.7	0.6	0.43				
e) Ratio between value added in agriculture and food consumption $\frac{Y_a}{C_{al}} = \frac{Y_a}{P} \cdot \frac{P}{P_{al}} \cdot \frac{P_{al}}{P^*_{al}} \cdot \frac{P^*_{al}}{C_{al}}$	0.79	0.78	0.76	0.68	0.62	0.37	0.98	0.90	0.60	0.47

Sources:

- (1) Istat, *Annuario di contabilità nazionale*, Rome, 1973.
- (2) Ercolani P., *Documentazione statistica di base*, in G. Fuà (ed.), *Lo sviluppo economico in Italia*, vol. 3, 2nd edition, Milan, Angeli, 1974.
- (3) G. Fuà, *Formazione, distribuzione e impiego del reddito dal 1861: sintesi statistica*, Rome, Isco, 1972.
- (4) Istat, *Indagine sullo sviluppo del reddito nazionale dell'Italia dal 1861 al 1956*, vol. 9 of series 8 of *Annali di statistica*, Rome.

In particular, I have drawn on sources (1) and (2) for the series at current prices of disposable income. To the value for the year 1949 given by (2) I have applied a correction coefficient equal to the ratio between the 1951 value given in (2) and the 1951 value given in (1).

I have used sources (1) and (4) for the series at current prices of GDP at factor cost, of gross output by agriculture, and of consumption. The 1949 values have been corrected as above. Gross output by agriculture is assessed net of subsidies to producers. Value added in the non-agricultural sector in rows *d*, *e* and *f* of Table 1 excludes rent of dwellings.

I have used source (3) tab. B.3.b for the series at constant prices of GDP at factor cost; (3), tab. B.1.a for the employed population; (3), tab. 1.1 for rates of variation in GDP at constant prices per inhabitant.

The ratios given in rows *b*, *c* and *d* of Table 4 have been taken from source (3), tab. 1.19, except that the 1967 value has been recalculated on the basis of the 1967 input-output table.

Although Table 1.19 of source (3) already contains the broad outlines of the statistical picture set out here, I have recalculated the figures using revised estimates and more rigorous procedures (and here I am grateful to P. Ercolani for his useful suggestions). This explains why the results sometimes differ.

My methodology, however, is still as set out in the notes to source (3). The reader is referred in particular to note A.2 of source (3) for justification of the division into five periods I have employed here.

All the values used here are three-yearly averages. The ratios have been calculated on figures that have not been rounded off. Readers reworking the calculations on the basis of the rounded-off figures in the tables may therefore find some slight discrepancies.

The term «agriculture» always stands for «agriculture, forestry and fishing»; the term «food consumption» for «food, beverages and tobacco».

The right-hand sections of Tables 2, 3 and 4 give the index of variation of the generic ratio x/y between date 0 and date 1 defined as follows: $(x_1/y_1)/(x_0/y_0)$.