

P: LABOUR PRODUCTIVITY

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To help us make concrete a concept that at first glance appears to be so abstract and distant, let us turn to two dialogues that took place between a traveller and a craftsman just over a century apart. The first, set in Florence, has a pre-industrial context and involves a famous passer-by, a 19th century traveller and Prime Minister of an important European nation, who was visiting the recently created capital of Italy, and a Florentine craftsman with very few tools which would now be defined as archaic. The second dialogue has a present-day context, once again in Florence, and involves a tourist in the city of the Medici and a Florentine craftsman with technologically advanced tools and equipment.

19th century traveller: *'How many shoes, sir, do you make in one day?'*

Florentine craftsman: *'In one day I just about manage to prepare the leather and cut the material for one pair of shoes that I will finish by sunset.'*

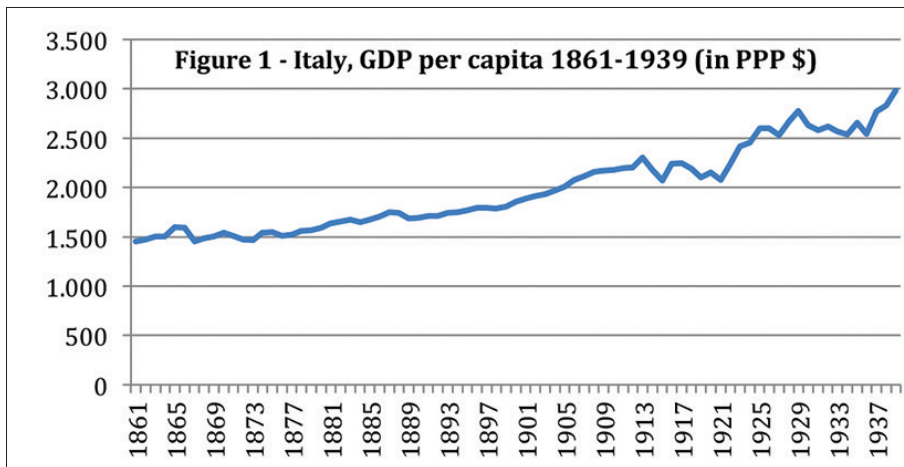
New Millennium tourist: *'How many shoes, sir, do you make in one day?'*

Florentine craftsman: *'In one day's work, if I am fit, motivated and in good spirits, I can make between 8 and 10 pairs of good quality shoes.'*

This dialogue shows that as time has passed and technology has advanced, labour productivity has increased approximately 8-10 times compared with the end of the 19th century. This dialogue also shows that labour productivity is simply the amount of goods produced by a worker in one day or in one working hour. It crucially depends on technological progress and the amount of capital and tools available in a certain period used by the worker. In 1800, the lack of capital and advanced tools and low level of technological progress kept productivity levels very low consequently, levels of income were also low. Today, a significant advance in technological progress, which increased considerably especially in the period immediately after the Second World War, results in much higher labour-productivity, a much higher production-level and, consequently, a much higher level of income. Income time-series, available through Angus Maddison's database, provide us with important information on income levels, for the above dialogues, and consequently clarifies the close links between income level and labour productivity.

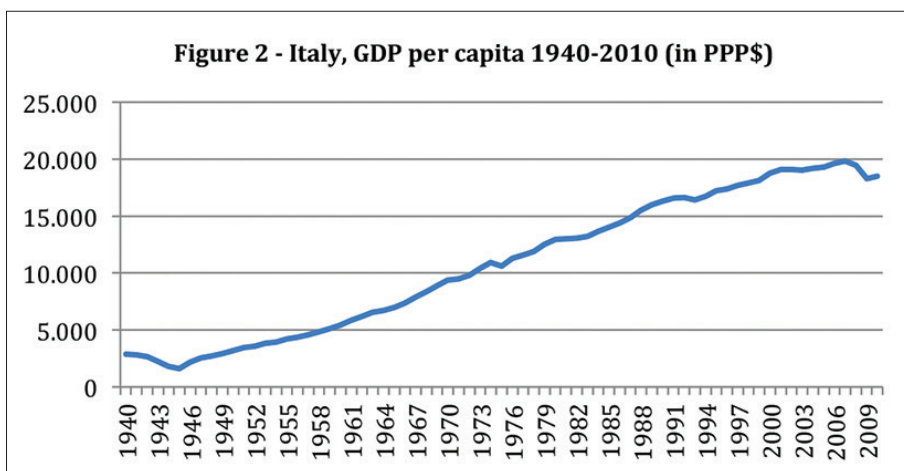


During the 1800s, the income level was fairly constant and stood at around 1500 \$ (in PPP), reaching 1800 \$ towards the end of the century and almost 3000 \$ before the Second World War.



Source: own elaboration, Maddison database

As is widely known, Italian economic development began after the Second World War and reached 20,000 \$ in more recent years (just before the current financial crisis), approximately ten times more than it was in our traveller's time at the end of the 19th century in Florence.

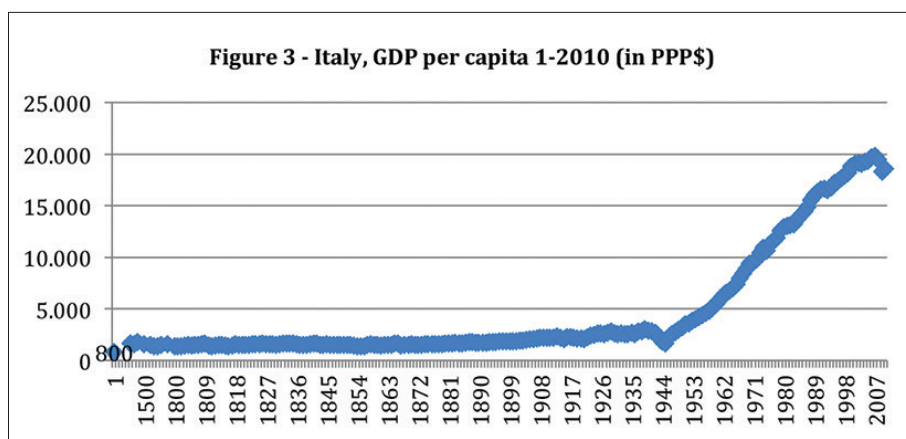


Source: own elaboration, Maddison database



Comparing the income level at the end of the 19th century and present-day Italy, as well as the levels of productivity then and now, is revealing: labour productivity, as well as income levels, have increased approximately 8-10 times in the same period. We have therefore established a stable, crucial correlation between productivity and income: as productivity increases, so does income.

Between the 1400s and up to the end of the 1800s, income fluctuated between 1500\$ and 1800\$. In this same period, labour productivity was stagnant, whereas it grew slightly between the end of the 19th century and the Second World War and steeply increased in the period after the Second World War when Italians' income increased significantly.



Source: own elaboration, Maddison database

If income increases when productivity grows, then the crucial issue to be examined remains labour productivity. What causes its potential increase and what stimulates its growth? We have mentioned technological progress and innovation, and this is definitely the main reason: in a period of great innovation in which new processes and new products are created, new ideas circulate and technological innovation is absorbed, companies introduce new machinery and new tools, and the economy as a whole increases labour productivity and both the production level and the income level. The period after the Second World War was definitely the best period and also the most important in terms of innovation and technological progress: the greatest innovations of all time occurred in this period and encouraged growth in labour productivity through unprecedented industrial development. The period between the Industrial Revolution (which, as we all know,



began in England at the end of the 18th century), and for the First World War provides the necessary conditions for a subsequent wave of modern development and the great innovations of the 1900s. During this period, modern societies witnessed big transformations and went from being industry-based economies to service-based ones. The biggest contribution to the transformation was a massive increase in labour productivity, stimulated by significant technological innovation and the many inventions in this period.

Before the Industrial Revolution in England and earlier still, in the Middle Ages, there was very little technological innovation and it was limited to agriculture and construction. Income was generated and, at best, offered the population a means of existence. This state of affairs prompted Malthus (1766-1834) and other economists and demographers who lived before the great technological advances of the 19th century to make apocalyptic predictions based on population growth that would have led to the cultivation of increasingly less fertile land and a decrease in food production. This would have resulted in a halt in economic development since the population would tend to increase at a geometric rate, i.e. faster than food production, which increases arithmetically. Malthus was wrong because he had not predicted the great development, initially technical and then economic, which encouraged labour productivity and began from the 19th century onwards in the agrofood industry, in industry in a narrow sense and in the economy as a whole. If we consider the 50 most important inventions of all time, according to a group of scientists interviewed by the *Atlantic*, from the invention of the wheel onwards, 20 occurred during the 19th century (with 15 in the second half), another 20 in the 20th century and only 10 prior to the year 1800. This explains the stagnation of labour productivity and income before 1800 shown in Fig. 3.

To a lesser extent, something else contributes to productivity growth. In the example of the dialogue, the Florentine craftsman answered the modern tourist saying that he also needed to be fit, motivated and in good spirits to produce between 8 and 10 pairs of good quality shoes and, obviously, needed his machinery and tools. Other factors are at play in productivity, beyond the economic: first of all, health but also motivation and good spirits, factors that are mostly psychological and social, but also institutional, and can have different origins, exogenous (social, political and psychological) and endogenous (the economic demand which increases the craftsman's motivation, i.e. his pay or wages if he is a worker). In addition to this, the dialogue implicitly shows that there is a need for the craftsman's expertise, his skills and his knowledge which is something quite different from technological innovation and innovation, and regards his training, cultural knowledge, experience and manual skills



which all have an important effect on his productivity. These are factors that are endogenous to the production process itself since they can be continuously increased through learning by doing and continuous training. Once again, the acquisition of these skills and the necessary cultural and educational knowledge crucially depends on economic and institutional incentives, the rules according to which individuals acquire knowledge, the school and education system and its level of accessibility.

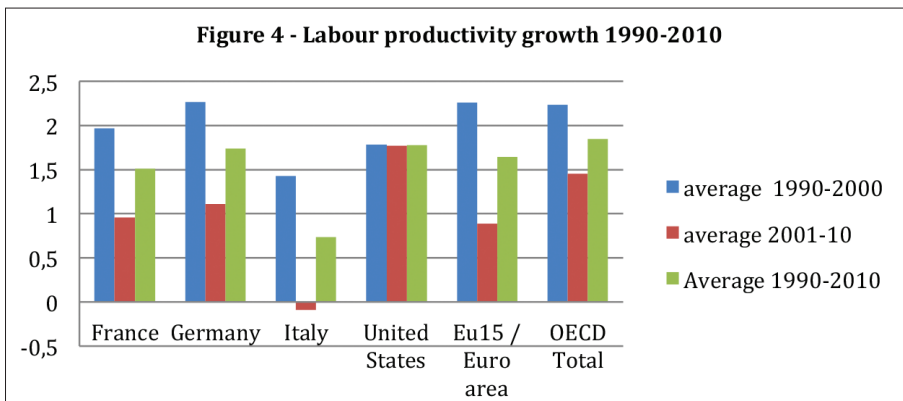
An important contribution regarding the influence of factors that are not strictly economic on increases in labour productivity comes from the New Keynesian Economics (NKE) literature in the 1970s and 1980s through a series of labour market models known as efficiency wages. The aim of the NKE is to show that through wages that are higher than equilibrium wages (if equilibrium wages actually exist) a worker's productivity increases. Contrary to the claims of the traditional neoclassical school, according to whom workers' wages are in equilibrium when they are paid according to marginal labour productivity, the NKE accepts the existence of positions of underemployment, created by the rational behaviour of individual employers who prefer to pay a worker more to encourage him to work harder and therefore achieve higher overall productivity which compensates in the long term, through better performance, for the higher labour costs incurred as a result of higher wages.

The efficiency wage model demonstrates that it is not in a company's interest to reduce the real wage in order to reduce unemployment because workers' productivity, seen in terms of effort or efficiency, depends on the real wage (McDonald, Solow, 1981). A firm should therefore fix a wage level that maximizes the effort made by workers or, symmetrically, minimises the wage cost per efficiency unit. This is based on a simple but realistic assumption: worker effort increases in line with an increase in the real wage and personal satisfaction (Solow, 1979).

Along the same lines, Salop (1979) states that rotation costs prevent worker turnover in the firm and decrease productivity. In order to avoid recruitment and training costs, employers avoid continually hiring workers and even prefer to pay a higher wage to encourage workers to continue to work for them. In this way, the productivity and efficiency of an individual worker increases and, at the same time, an employer minimises rotation costs for new workers. Continuous experience in the same company, learning by doing, a relationship based on trust and continuous training are all factors that are not strictly economic which increase worker effort and therefore productivity. In this context, the continual increases in labour flexibility which have been promoted over the last two decades

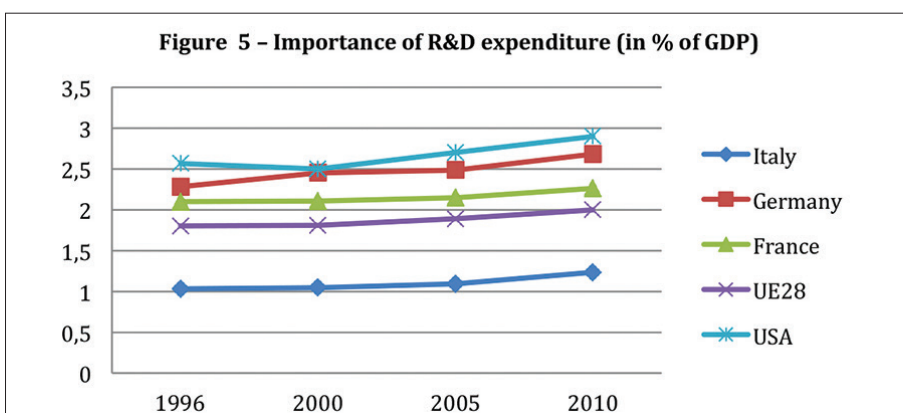


by some European governments, and especially Italy, do not seem to be heading in the right direction when it comes to increasing productivity. Indeed, the situation in Italy regarding labour productivity over the last two decades is extremely negative as can be seen in Fig. 4 below.



Source: own elaboration based on OECD data

At the same time, low investment in our country in Research and Development (R&D) has widened the gap in productivity with Italy's main partners. Clearly, a combination of these two factors (lack of investment in R&D and labour flexibility with wage compression) comes at the expense of increases in productivity, which are stifled by a lack of expansion of aggregate demand (due to a decline in consumption), an increase in the cost of labour per unit of output, and a lack of investment, especially in technologically advanced sectors.



Source: OECD (2012) and Eurostat (2012)



This result is also supported theoretically if we assume that productivity depends on a combination of the Smith effect (increased demand, with reorganization and division of labour) and the Ricardo effect (investments that replace labour with capital-specific technological change). Through this approach, we can see a negative correlation between productivity and labour flexibility as shown by other contributions (Kleinknecht *et. al.*, 2013; Tridico, 2013; Tridico, 2015; Antonioli and Pini, 2013). The following equation, formulated by Sylos Labini (1993; 1999), presents the determinants of labour productivity according to this approach:

$$\Delta\pi = a + b\Delta Y + c(CLUP - P) + d(W - P_{MA}) + e\Delta I$$

The change in labour productivity ($\Delta\pi$) depends positively on the change in product (ΔY), the change in investments (ΔI) and the differences of the variables in brackets where P is the price index, PMA the prices of machines and ULC the labour cost per unit of output, i.e. the ratio between the change in wages and the rate of productivity growth. If the ULC grows faster than the consumer price index, companies with a lower profit margin will be forced to save on labour and make capital intensive investments or reorganize the workforce within the company. If wages increase more than the prices of machinery, firms will prefer to increase their technological investments and save on labour because this is cheaper than employing new, more expensive workers, and productivity will therefore increase. Consequently, this will lead to higher employment. This also implies that if wages do not increase in line with the price of machinery, investments will not be adequately stimulated, businessmen will focus on seeking advantageous positions, and the competition will rely primarily on wage moderation, with a negative impact on productivity. The important role played, in this approach, by an increase in wages and a fair distribution of income in order to increase productivity is interesting to observe.

In Italy, characterised by stagnant productivity over the last two decades up until 2007-08, i.e. prior to the financial crisis, there was nonetheless an increase in employment in the tertiary sector which was fragmented and disorganized, unmotivated and with low pay. This led to stagnation of the Italian economy.

If L (employment) increases and the GDP does not increase, stagnation of the GDP can obviously be attributed to poor productivity π .

$GDP = Y = LI$ (L=employment and Π =average productivity) in changes: $\Delta y = \Delta l + \Delta \pi$.

This would appear to be exactly what has happened in Italy recently:



low wages and labour flexibility, often accompanied by insecurity, few incentives and bonuses for employees, have led to reduced commitment and therefore reduced efficiency of workers in the workplace. A reduction in real wages, and therefore a minimisation of costs, rational behaviour by individual employers, has not led to an increase in system productivity or an increase in production; on the contrary, it has led to an increase in profits which have not been transformed into new investments, has strengthened the dominant position of some companies, and has worsened income distribution. The economic system has not had positive effects, productivity is stagnant, and the competitiveness of the Italian system as a whole has worsened as shown by the undisputed Unit Labour Cost (ULC).

Table 1 – An international comparison of unit labour cost and productivity

(annual average growth rate, total economy)		
Countries	ULC*	Productivity**
	2000-2010	2000-2010
Germany	0.2	1.5
France	1.8	1.0
Italy	3.2	0.0
Spain	2.9	0.4
UK	2.9	1.4
USA	1.7	2.2
* Cost of labour per employee in relation to productivity.		
** Value added per employee.		

Source: my own elaboration based on Eurostat data

In this context, the Italian co-operative sector, unlike the overall figures for Italy, records double positive figures: alongside the positive figures for employment, the co-operative sector has also recorded positive development in productivity, unlike the economic system as a whole. If we consider a book by Bernardi, Treu, Tridico written in 2011, we can see that the productivity performance of co-operative enterprises during the crisis was better. This can be attributed, above all, to the specific characteristics of co-operative enterprises, which focus on non-economic factors such as trust, participation, motivation, belonging and so on far more than other companies. All this comes at a time when the Italian economy



is not performing well, the economic system has a number of failings, the country is far from being competitive and efficient, investments in R&D are low and lower than the EU average, labour productivity is not growing and the GDP as a result is stagnant.

In these circumstances, we can see, as the authors of the work mentioned above did, that productivity is higher among companies and workers where there are more motivational factors and non-economic incentives, as in the co-operative sector. Since the level of investment in the co-operative sector has remained in line with the figure for the overall economic system, the increases in efficiency achieved in this area seem to be due to better organization of work, monetary incentives, and motivational and institutional factors guaranteed by the specific legal form of co-operatives and their specific social structure. Co-operatives not only hand out wages but activate a positive circuit driven by a number of incentives including participation, responsibility, social objectives, solidarity and trust. This can be the basis of virtuous behaviour.

This would seem to show that enterprises and workers behave differently, something which can be explained by referring to institutional and motivational aspects which may well be overlooked in reductionist theoretical models.

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