

# **Italian Spending on Education: a Long-Term Perspective**

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## **Abstract**

This paper analyses the long-term evolution of public spending on education in Italy. After presenting a historical overview of the Italian school system, we analyse the trend of public expenditure on education from the Unification of Italy up to the present day, comparing it with other items of public expenditure, in particular social expenditure. We also explore a long-term comparison of expenditure on education between some European countries. Our analysis seems to suggest extremely clear policy implications. Expenditure on the social system appears to be too high compared to expenditure on education, for this reason rebalancing intervention seems necessary.

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**Keywords:** Government expenditure, Italian school system.

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## **1. Introduction**

This paper analyses the long-term evolution of public spending on education in Italy. Economic theory (Solow-Swan growth model<sup>3</sup>) has shown that labour and physical capital growth since the mid-1950s can account for only part of the observed growth in real GDP per capita. The fraction not explained by the growth of productive input (labour and capital) is considered “residual” and represents the increase in total factor productivity: it is often considered a measure of technical progress in the economic system. In the following years, economic theory concentrated on finding an exogenous explanation for technical progress. This interpretation suggested that the concept of capital relevant for economic growth should be considered more carefully, dividing it into two dimensions: physical capital and human capital. The introduction of human capital allows an interesting interpretation of technological progress; in fact, if the residual also contains the rate at which human capital is accumulated, the greater the accumulation of human capital the higher the economy growth rate.<sup>4</sup>

The concept of human capital is represented by the wealth of knowledge available, therefore it is given by the years of schooling, training and professional experience acquired by individuals.<sup>5</sup>

From the above, it is clear that the study of public policies and spending on education is relevant in analysing the formation process of human capital in a country.

From the moment Italy was unified, the offer of a good school system was perceived by the Italian ruling class as one of the essential tasks of the new State. It was already clear at the time that education could play a dual role, both in educating workers to participate in the economic development process and in educating citizens to ensure greater social and political stability.<sup>6</sup>

European countries began to provide primary education free of charge in the mid-19th century, although in many of them the proportion of the population that actually attended such schools was much smaller than the potential one, and many remained illiterate.

This paper examines the following aspects: the second section presents a historical overview of the Italian school system, serving as an introduction for the analysis of the data presented in the second part of the paper; the third section analyses the trend of public expenditure on education from the unification of Italy up to the present

<sup>3</sup> Solow (1956) and Swan (1956).

<sup>4</sup> For more information on the relevance of human capital for economic growth, see: Barro and Sala-i-Martin (1995), Hanuscheck and Woessmann (2010) and Goldin (2016).

<sup>5</sup> Note that although education and human capital are closely related, they are not equivalent: “education allows the accumulation of human capital, but the latter is also composed of direct experiences, at work or in other fields that are beyond what can be learned at school or university”; Cappelli (2017).

<sup>6</sup> Although the objective was clear, the subsequent legislative choices seemed to go in part against the trend to achieve it. Cappelli (2016).

day, comparing it with other items of public expenditure, in particular social expenditure; the fourth section makes a long-term comparison of expenditure on education between some European countries; lastly, the fifth section presents the policy implications of our analysis.

## **2. The Italian school system from Unification to present day**

This section aims to present a summary of the historical evolution of the Italian school system. Analysing educational institutions is fundamental in order to interpret the trend in public expenditure on education, which will be the subject of the subsequent section.

Following A'Hearn, Auria and Vecchi (2011) and Capelli (2017), we can essentially identify three distinct phases in which to examine legislation in the education sector and the various successive reforms in the Italian school system: the liberal period (1861-1922), the fascist period (1923-1945) and the republican period (1946 to present day).

The law that regulated the Italian school system at the time of its establishment (17 March 1861) was the Casati Law promulgated in 1859 in the Kingdom of Sardinia by royal decree, which entered into force in 1860 and was subsequently extended to all of Italy with the unification.

This law provided for free primary education divided into two biennial cycles, one lower and one upper. The compulsory lower cycle began at the age of six. The cost of primary education was entrusted to the Italian municipalities. Each municipality was to guarantee at least one lower cycle, while the upper cycle was limited only to municipalities with the highest urbanisation rates and those where secondary schools were present. The law established criminal penalties for parents who failed to send their children to lower primary school.

At the end of primary school, the children who decided to continue to secondary school had two options: to choose either,

- a) classical secondary education consisting of a five-year gymnasium-lyceum to be provided by the municipalities, followed by three years of high school, financially charged to the central state, which then allowed access to all university faculties, or alternatively.
- b) technical secondary education organised into three years of technical school, the cost of which was borne by the municipalities, followed by three years at a technical institute, the cost of which was financed by the central state. The technical institute allowed access only to scientific university faculties.

The 1871 census certified a significant decline in the level of illiteracy compared to the pre-unification situation, which was already disastrous in itself; (A'Hearn, Auria and Vecchi; 2011).

The fact that the municipalities were entrusted with the task of managing primary schools, both in terms of funding and in terms of selecting the teaching staff, was the fundamental weakness of the Casati Law; in fact, many municipalities lacked adequate financial resources to fulfil this task, and teachers with poor qualifications

were often selected, who did not even have a primary education teaching degree. Furthermore, although the law threatened to impose penalties on those who violated the obligation to attend school, such penalties were never explicit from a legislative point of view, with the direct consequence that the obligation was largely disregarded, especially in the southern regions where there was a strong need for child labour in the agricultural sector.

All this reinforced the enormous disparities in the quality and existence of primary schools between the north and south of the country.

The political choice of the historical right to entrust the central state with the sole task of secondary and tertiary education in order to prepare the country's future ruling class, ignoring primary school, which in the 19th century was the pillar for mass formation, was a decision in "contrast to the growing need for human capital caused by the spread of the Second Industrial Revolution in Europe" (Cappelli 2017, p. 15).

The ministerial surveys on primary schools carried out between 1865 and 1922 highlighted the disastrous situation of the Italian school system, in terms of both results and funding.

The response of the various governments that followed one another in the liberal period was a series of legislative interventions.

In 1877, the Coppino Law increased compulsory education to three years, with enforcement measures and fines for non-compliant parents, and introduced a five-year curriculum for primary school (Bertola and Sestito 2013). However, the funding for primary school was left to the individual municipalities. In 1903, the Nasi Law established the figure of Scholastic Director and thus reduced the discretion of municipalities in the recruitment and dismissal of teachers, regulated the maximum number of pupils in a class and eliminated the gender disparity between teachers' salaries. The Orlando Law of 1904 brought compulsory schooling to age 12 and created sixth grade, bringing the compulsory education for all Italians up to that year. Another important year was 1906, with the promulgation of the special law which financed the construction of new primary schools in Southern Italy; (A'Hearn, Auria and Vecchi, 2011). The Daneo-Credaro Law of 1911 assigned the state the burden of the entire cost of personnel and materials for primary schools, leaving the municipalities with the sole task of providing school buildings.<sup>7</sup> Unfortunately its application was problematic, also due to the outbreak of the First World War (Vasta 1999: 1056-1057).

With the coming to power of the fascist party, the Minister of Education Giovanni Gentile radically reformed the school system with a series of decrees in 1923.<sup>8</sup>

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<sup>7</sup> For a deeper analysis on this reform see Capelli and Vasta (2020).

<sup>8</sup> The Gentile Reform was defined by Benito Mussolini, former elementary school teacher, as "The most fascist of reforms".

The five-year, single-cycle primary school was established and compulsory schooling was raised to 14 years of age. After completing the primary education phase, a student could follow four different paths for secondary school:

- a) five-year gymnasium-lyceum followed by the three-year classical high school or four-year scientific high school, both of which allowed access to university;
- b) technical institute divided into a four-year lower course, followed by a four-year upper course;
- c) master institute, divided into a four-year lower course and a three-year upper course, intended for training primary school teachers;
- d) supplementary vocational school, which lasted three years, at the end of which it was not possible to enroll in any other school.

With the Gentile Reform, the role of the central state was placed at the center of the education system, as well as state funding, with strong administrative centralisation and the adoption of a joint ministerial program. The quality levels of all study courses were high, beyond solely those that allowed access to university, with progress examinations held during the cycle of primary, lower secondary and upper secondary schools (Bertola and Sestito 2013).

Over time fascism became a totalitarian regime and the elitist Gentile school system proved inadequate with respect to the needs of the mass school regime, which also involved the less well-off classes, promoting social mobility. All this led to the 1939 School Charter proposed by the Minister of National Education Giuseppe Bottai and approved by the Great Council. The Bottai Reform gave a strong impetus to the study of scientific subjects and practical activities, placing them on the same level as the humanities in order to support the needs of the Italian economy. Due to the outbreak of World War II (1940), the reform went unimplemented with the exception of the creation of the three-year lower secondary school, which unified the classes preceding high school and the state and technical institutes, while the vocational path consisting of training school continued as an alternative to middle school.

### **3. Italian spending on education**

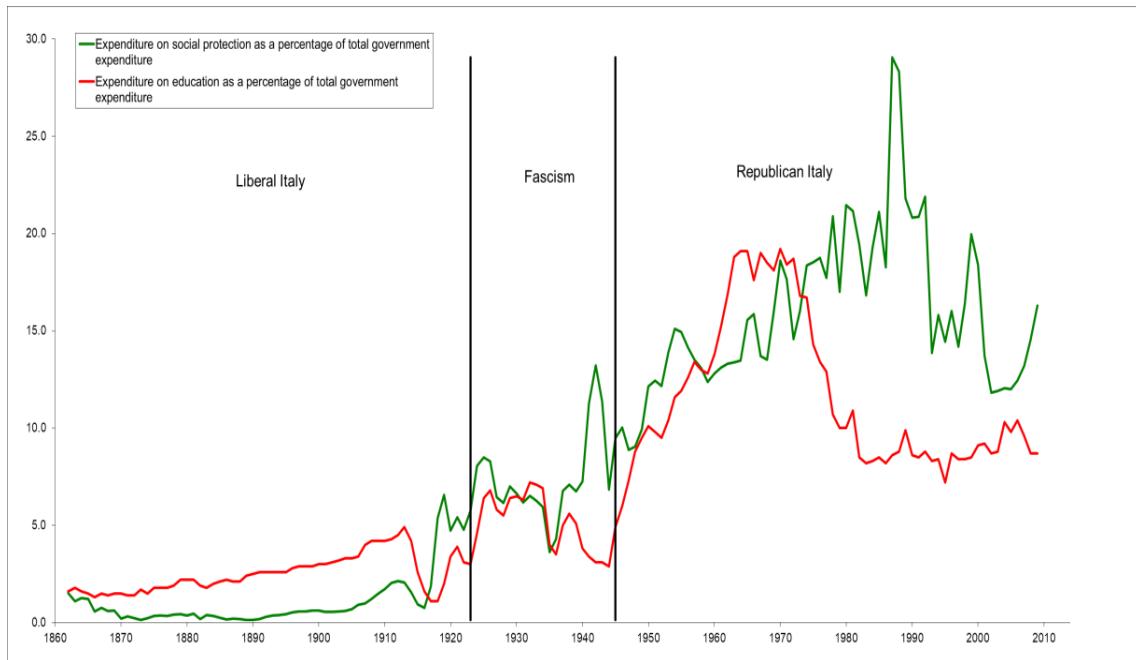
With the establishment of the Kingdom of Italy, only 27% of the adult population of the new state knew how to read, a value much, much lower than that of the most literate countries of the time; for example, Sweden had a literacy rate of about 90%, Prussia about 80%, but also compared to England and France, with values of 65% and 55% respectively. Moreover, Italy also showed strong territorial disparities. For example, Piedmont and Lombardy had literacy rates of 50.6% and 48.7% respectively, while Basilicata and Calabria had very low literacy rates of 11% and 12% percent respectively (A'Hearn, Auria and Vecchi, 2011).

Despite the fact that it was clear to the ruling class that it was necessary to bridge both the gap with the most advanced European countries and to close the existing regional gap, this need did not translate into immediately higher public spending in the education sector. In fact, in the first ten years after unification (1862-72), public

expenditure on education never exceeded 1.8% of total expenditure, and even remained significantly below the Civil List, which included the expenses for the maintenance of the Royal family which were charged to the public budget (Tanzi, 2012).

In the aftermath of the Unification of Italy, the funds earmarked for the payment of interest on public debt and for national defence absorbed a considerable portion of the total expenditure.<sup>9</sup> Together with social spending, spending on education were the two lowest items in the budget, accounting for 1.6% and 1.5% of total spending in 1862, respectively.

Given that they have the same initial level, it is useful to compare the trend of the two categories of expenditure over the last 150 years, obviously even if partial, as this allows analysing the distribution of weights between young and old in Italian society and therefore ultimately a way of seeing how investment in human capital has been an objective pursued by the ruling class, from Unification to today (see figure 1).



Source: Our processing of RGS (2011) data.

**Figure 1: A comparison between public expenditure items.**

<sup>9</sup> For an econometric analysis of government spending and its components in Italy in the period 1862-2009, see Pistoresi, Rinaldi and Salsano (2017) and (2018).

During the period of liberal Italy (1861-1922), spending on education was always above social expenditure, except for the last period (1917-1922), that is, during and immediately after the First World War. The average annual growth rate composed of spending on education in the six decades of liberal Italy was always positive except in the first and last decades, respectively -0.9% and -7.2%. It should be considered that only in 1911 (Daneo-Credaro Law) was school financed entirely by the central government, whereas in the past the financing of primary school was the responsibility of the municipalities. In the 20 years of the fascist regime (1923-1945), spending on education was always lower than social spending, except in the period 1931-1935; this result was likely initially due to the consequences of the First World War and later in the second decade of the regime (1936-45) to the Second Italo-Ethiopian War and the Second World War. The compound average annual growth rate of spending on education in the first decade of fascism was positive at 12.2%, while in the second decade it was negative at -2.5%.

In the Republic period (1946-present day), expenditure on education has always been below social spending, except in the period 1959-1973. Expenditure on average 10-year compound annual education grew positively until the end of the 1960s, before becoming negative in the following three decades, equal to -5.8% between 1970 and 1979, -0.1% between 1980, and 1989 and -1.5% in the period 1990-99, and only in the last decade considered was it positive again, although it only grew slightly, by 0.2%, from 2000 to 2009. If we consider the average value for the entire period (1862-2009), expenditure on education is lower than social expenditure, respectively 6.3% compared to 8.5% (see table 1).<sup>10</sup> The data examined seem to reveal a country that has financed the education sector much less than other public expenditure items. In particular, although conditioned by the demographic trend, we cannot deny that the spending policies implemented in Italy in the last 50 years have favored the past i.e., the elderly, with high social spending in macroeconomic terms, rather than the future, i.e., youth, with low education spending. This political choice was pursued despite the different relationship between the two types of expenditure with the growth rate of the Italian economy.

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<sup>10</sup> See Table 1 for all the descriptive statistics on education expenditure and social expenditure.

**Table 1: Descriptive statistics**

	<b>Government expenditure on education (%)</b>	<b>Government expenditure on social protection (%)</b>
Average	6.83	8.50
Standard deviation	5.01	7.45
Max	19,2	29.10
Min	1.1	0,10
Number of observations.	148	148

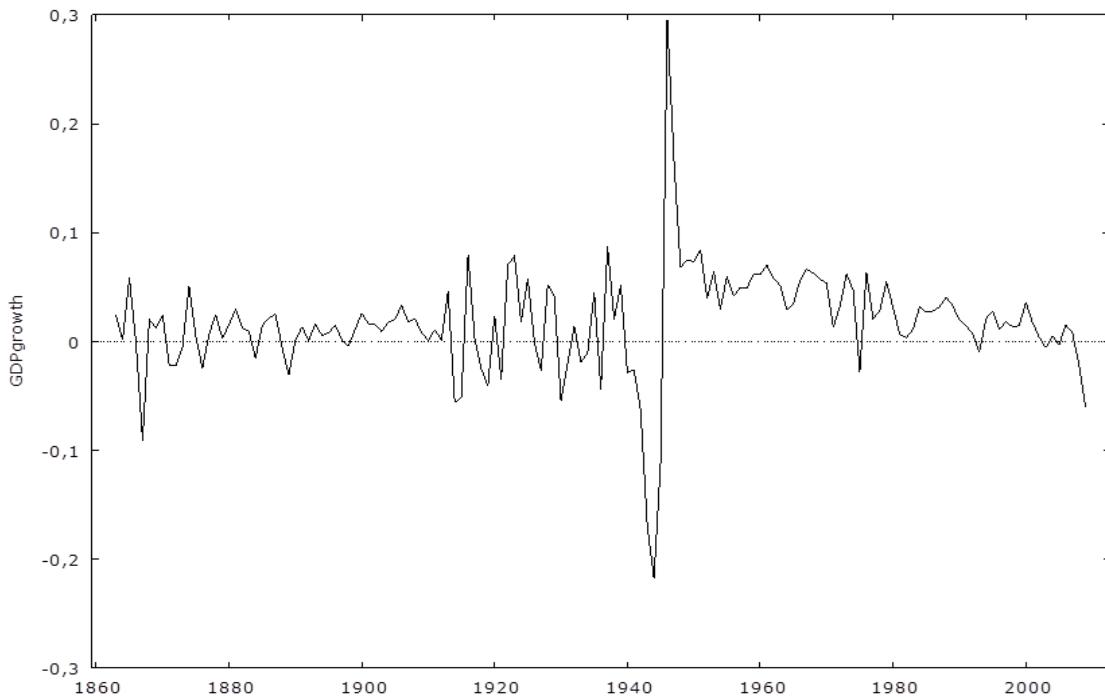
Source: Our processing of RGS (2011) data.

In table 2 we present both the correlation between economic growth and the growth of government spending on education and the correlation between economic growth and the growth of social spending. We note that the correlation economic growth and education is greater than with social spending in all sub periods considered, moreover it is always significant (5% significance level). The correlation between economic growth and social spending is significant only from 1946 onwards (see table 2). These results suggest that the spending policy pursued by the Italian governments in the post-war period was not very far-sighted in terms of the country's long-term development.

**Table 2: Correlations among economic growth and public spending on education and social protection (growth rates)**

	<b>1861-1922</b>	<b>1923-1945</b>	<b>1946-1973</b>	<b>1974-2009</b>
Economic growth and growth in education spending	0.36*	0.78*	0.91*	0.72*
Economic growth and growth in social protection	0.19	0.43	0.65*	0.48*

Notes: \* statistical significance, critical values 5%



Source: Our processing of RGS (2011) data.

**Figure 2: Growth rate of GDP from the Unification of Italy to the present day.**

#### 4. A European comparison of public expenditure on education

This section presents a comparison of European public expenditure on education as a percentage of GDP. Table 3 shows unique results for Italy. Throughout the period considered, public funding in the education sector in relation to GDP is always below the average of the sample of European countries considered. Italy is almost always in the last position in terms of public funding for education, with only Spain achieving worse results.

The distance from Sweden and Norway, the two countries with the highest level of public expenditure in the sample considered, appears wide and above all persistent over time.

Figure 3 offers a comparative perspective for the period 1861-2001 on the ratio of enrolled pupils to primary school teachers, between Italy and a group of Western European countries.

In the case of Italy, for the first years after Unification, each teacher was assigned an average of about 36 children, reaching a maximum of about 47 children in 1907. This value is commonly found in countries with conditions of underdevelopment, with the countries of Central Africa currently showing similar values. The value

remains high and more or less constant (about 42 children) until the beginning of World War II. This may be due to the fact that once the initial cost of structuring the educational service was incurred, albeit poorly, since the school attendance rate began to rise, the initial fixed cost of hiring teachers was distributed to a wider audience of pupils. It is interesting to note the diametrically opposite case of the United Kingdom in the same period, which started in the mid-1800s with a pupil-teacher ratio of about 100 and then significantly decreased year by year to reach a value of about 27 children at the beginning of World War II.

The decline in the teacher-pupil ratio after World War II is equally high for Italy. Does this indicate that there was also an increase in the quality of the Italian school system?

Following A'Hearn, Auria and Vecchi (2011, p. 193), although this indicator can be considered both as a measurement of the investment of resources in education and as an indicator of the quality of education, the case of Italy seems to contradict this latter interpretation. The OECD data (2010) for the period 2007-2008 show that Italy has a higher number of teachers than the OECD average, both for primary and secondary schools<sup>11</sup>, although the results of Italian students are generally worse than those of their European colleagues in international assessments.

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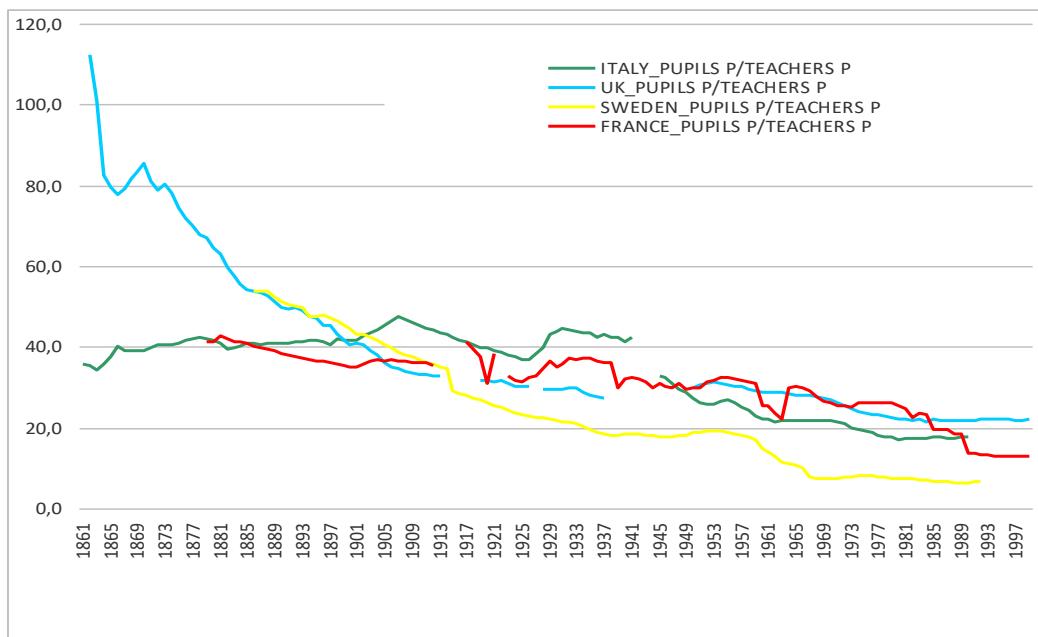
<sup>11</sup> The ratio is 10.6 pupils per teacher in primary school compared to 16.4 of the OECD average, while 10.8 pupils per teacher in secondary school compared to 16.4 of the OECD average; A'Hearn, Auria and Vecchi (2011).

**Table 3: General government expenditure on EDUCATION (% del GDP) in some European countries. Years 1870-2008.**

Countries	Around 1870*	1913	1937	1960	1980	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Austria	...	...	2,5	2,9	5,6	5,5	...	6,04	5,94	5,84	5,80	5,86	5,66	5,74	5,68	5,53	5,48	5,44	5,40	5,33	5,47
Belgium	...	1,2	...	4,6	6,1	5,6	...	...	...	...	...	...	5,99	6,09	6,02	5,95	5,92	5,98	6,00	6,43	
France	0,3	1,5	1,3	2,4	5	5,8	6,0	6,04	6,01	6,03	5,95	5,81	6,04	5,95	5,90	5,92	5,80	5,67	5,61	5,62	5,62
Germany	1,3	2,7	...	2,9	4,7	4,8	...	4,62	...	4,55	...	4,51	4,45	4,51	4,72	4,74	4,62	4,57	4,43	4,49	4,57
Ireland	...	...	3,3	3,2	6,6	6,4	5,9	5,07	5,30	5,11	4,82	3,34	4,29	4,24	4,27	4,35	4,66	4,72	4,73	4,92	5,67
<b>Italy</b>	<b>0,1</b>	<b>0,6</b>	<b>1,6</b>	<b>3,6</b>	<b>4,4</b>	<b>5,2</b>	<b>5,0</b>	<b>4,85</b>	<b>4,78</b>	<b>4,46</b>	<b>4,65</b>	<b>4,47</b>	<b>4,52</b>	<b>4,83</b>	<b>4,60</b>	<b>4,72</b>	<b>4,56</b>	<b>4,41</b>	<b>4,67</b>	<b>4,27</b>	<b>4,56</b>
Norway	0,5	1,4	1,9	4,2	7,2	9,2	7,8	7,44	6,98	7,59	7,60	7,30	6,74	7,18	7,58	7,55	7,42	6,97	6,49	6,66	6,40
Netherlands	...	...	1,5	4,9	7,6	5,5	5,1	5,06	5,03	4,78	4,82	4,90	4,98	5,09	5,22	5,47	5,50	5,53	5,50	5,32	5,50
UK	0,1	1,1	4	4	5,6	5,6	5,4	5,02	5,10	4,97	4,77	4,47	4,64	4,58	5,06	5,21	5,12	5,31	5,38	5,29	5,28
Spain	...	0,4	1,6	1,3	2,6	4,7	4,7	4,66	4,62	4,48	4,42	4,38	4,28	4,24	4,25	4,28	4,25	4,23	4,26	4,34	4,62
Sweden	...	...	...	5,1	9	8,4	7,1	7,22	7,36	7,60	7,69	7,30	7,16	7,06	7,36	7,21	7,09	6,89	6,75	6,61	6,76
<b>Average European countries (**)</b>	<b>0,46</b>	<b>1,27</b>	<b>2,21</b>	<b>4,70</b>	<b>5,85</b>	<b>6,1</b>	<b>5,9</b>	<b>5,6</b>	<b>5,7</b>	<b>5,5</b>	<b>5,6</b>	<b>5,2</b>	<b>5,3</b>	<b>5,4</b>	<b>5,5</b>	<b>5,5</b>	<b>5,4</b>	<b>5,4</b>	<b>5,4</b>	<b>5,5</b>	

(\*)Closest year for all columns. (\*\*) Simple average calculated on the only available data (and, in some cases, only partially representative of the geographical aggregate).

Source: Tanzi e Schuknecht (2007) and Eurostat, Government finance statistics: (January 2018)



Source: Our processing of Mitchell (2007) data.

**Figure 3: The ratio of enrolled pupils to primary school teachers, an European comparison.**

## 5. Conclusion

Our analysis seems to suggest extremely clear policy implications. The current share of public expenditure on GDP is too high and acts like a brake on Italy's economic growth. This should induce the Italian policymaker, as well as to impose a reduction in spending in order to avoid public finance problems which periodically recur in the country, to also carry out a serious and broad maneuver aimed at improving the expenditure itself.

In particular, expenditure on the social system (pensions) appears to be too high compared to expenditure on education. As explained above, this distribution was guided by a demand for such services from the Italian electorate.

A rebalancing intervention seems necessary; indeed, despite the fact that Italy's human capital has grown considerably over the last 30 years<sup>12</sup>, it has not closed, both in terms of quantity and quality, the ancient gap that separates it from other OECD economies (Sestito, 2014).

Improving the quality of human capital cannot, therefore, be without interventions

<sup>12</sup> Average years of education per employee rose in the 1990s from 9 to 11 years, after growing from 7.5 to 9 years in the 1980s. The percentages of high school and university graduates have considerably increased among both younger and older employees. Other indicators such as the use of computers, knowledge of foreign languages and the number of books sold confirm this trend of Italian human capital growth.

on schools and universities. These certainly concern the review of incentives to learn or teach, the appreciation and compensation of merit, better and continuous evaluation, the adaptation of teaching programs, and more attractive school environments (Visco, 2014).

From a quantitative point of view, public investment in education and research and development must be increased<sup>13</sup>, which represents a fundamental determinant of economic growth through the technical progress it generates and which is incorporated into the capital goods used in the productive process. The component which is not yet incorporated in these goods, namely innovation, is reflected in the total productivity of the inputs. This is generally true for all countries, but even more so in Italy, where the presence of small and medium-sized companies often leads them to not invest in training and research and development and most of the time their innovations are only incremental and generate new goods for companies, but not for the market; overall, the effect on growth potential is diminished (Visco, 2014).

The above conclusion refers to an important issue, which is perhaps the most serious one today and can be identified in the choices concerning Italian public spending<sup>14</sup>, namely the absence of a close link between findings, priorities and objectives, and a poor culture of accountability of the choices made by the Italian political class.

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<sup>13</sup> By funding research projects carried out by universities or public research bodies (on this point see Mazzucato, 2013).

<sup>14</sup> In other historical periods, that is, after Unification and the aftermath of the Second World War, the Italian ruling class of the time was able to set both objectives and strategies in order to transform society and promote economic development in Italy.

## References

- [1] A'Hearn, B., Auria C., and Vecchi G. (2011). Istruzione. In ricchezza e in povertà. Il benessere degli italiani dall'Unità ad oggi. Edited by G. Vecchi, 159–206. Il Mulino, Bologna.
- [2] Baffigi, A. (2011). Italian national accounts, 1861-2011. Economic History Working Papers, No 18. Banca d'Italia, Roma.
- [3] Barro, R., and Sala-i-Martin, X. (1995). Economic Growth. First edition, McGraw-Hill, New York.
- [4] Bertola, G., and Sestito, P. (2013). Il capitale umano, in G. Toniolo, L'Italia e l'economia mondiale. Dall'Unità a oggi. Marsilio, Venezia, pp. 343-374.
- [5] Cappelli, G. (2017). Capitale umano e crescita economica: l'evoluzione del sistema educativo italiano, in Di Martino P. and Vasta M. (eds.), Ricchi per Caso. La Parabola dello Sviluppo Economico Italiano, Il Mulino, Bologna.
- [6] Cappelli, G. (2016). Escaping from a human capital trap? Italy's regions and the move to centralized primary schooling, 1861–1936. European Review of Economic History. 20 (1), pp. 46–65,
- [7] Cappelli, G. and Vasta, M. (2020). Can school centralization foster human capital accumulation? A quasi-experiment from early twentieth-century Italy. The Economic History Review. 73(1), pp. 159-184.
- [8] Hanuscheck, E.A and Woessmann, L. (2010). Education and Economic Growth. In: Peterson, Penelope (ed.): International Encyclopedia of Education. Oxford: Elsevier. pp. 245-252
- [9] Goldin, C. (2016). Human capital. In C. Diebolt and M. Haupert, eds., Handbook of Cliometrics, Berlin and Heidelberg, pp. 55–86.
- [10] Mazzucato, M. (2013). The Entrepreneurial State – Debunking Public vs. Private Sector Myths. Anthem Press.
- [11] Mitchell, B. R. (2007). International Historical Statistics 1750–2005. Volume. 3, 6th ed. Palgrave Macmillan, New York.
- [12] Pistoresi, B., Rinaldi, A. and Salsano, F. (2018). La spesa pubblica in Italia. Una crescita senza limiti?. Franco Angeli, Milano.
- [13] Pistoresi, B., Rinaldi, A. and Salsano, F. (2017). Government spending and its components in Italy, 1862-2009: drivers and policy implications. Journal of Policy Modeling, 39(6), pp. 1117 - 1140.
- [14] Ragioneria Generale dello Stato (RGS). (2011). La spesa dello Stato dall'Unità d'Italia. Anni 1862-2009. Ragioneria Generale dello Stato, Roma.
- [15] Sestito, P. (2014). *La scuola imperfetta*. Il Mulino, Bologna.
- [16] Solow R. (1956). A Contribution to the Theory of Economic Growth. The Quarterly Journal of Economics. 70 (1), pp.65-94.
- [17] Swan, T. (1956). Economic Growth and Capital Accumulation. The Economic Record. 32 (2), pp. 334-361.
- [18] Tanzi, V. and Schuknecht, L. (2000). Public Spending in the 20th Century A Global Perspective. Cambridge University Press.

- [19] Tanzi, V. (2012). A century and a half of Public Finances in Italy, IBL BOOK, Torino.
- [20] Toniolo, G. (2013). L’Italia e l’economia mondiale. Dall’Unità a oggi, Marsilio, Venezia.
- [21] Vasta, M. (1999). Capitale umano e ricerca scientifica e tecnologica. in F. Amatori, D. Bigazzi, R. Giannetti, and L. Segreto, eds., Annale Einaudi—Storia dell’industria italiana dall’Unità ai giorni nostri (Turin, 1999), pp. 1024–41.
- [22] Visco, I. (2014). Investire in conoscenza. Il Mulino, Bologna.