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Escaping from a human capital trap? Italy's regions and the move to centralized primary schooling, 1861 – 1936

Gabriele Cappelli

Universität Tübingen (Faculty of Business and Economics)

Chair of Economic history

Melanchthonstraße 30, (Room 105) 72074 Tübingen

gabriele.cappelli@eui.eu

+49 (0) 7071 - 29 78 161

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Abstract

The role played by public policy in the development of Italy's human capital in the late nineteenth century and the Interwar period has long remained unexplored by quantitative economic history. This paper explores whether a system of decentralized primary education slowed down regional convergence in schooling, since poor and backward areas could not afford to invest a suitable amount of resources in education. It also investigates whether a more centralized system introduced in 1911 fostered the development of basic education and reduced the country's regional disparities. The analysis confirms the existence of such a human capital trap, and shows that centralized primary education fostered the development of Italy's schooling in the Interwar period.

1. Introduction

Human capital is a central determinant of economic performance. One line of research, dating back to the work of Lucas and Romer, suggests that a more educated labour force greatly improves a country's rate of growth (Lucas, 1988, Romer, 1990). However, theoretical models seldom provide insight into the way that human capital actually affects economic performance (Thirlwall, 2005, Todaro and Smith, 2011). A more long-term perspective has allowed researchers to identify some of the mechanisms linking human capital and growth. For example, Becker et al. maintain that an inverse relationship between fertility and human capital is responsible for the presence of different growth equilibriums across countries (Becker, Murphy and Tamura, 1990). This has recently become a key feature of Unified Growth Theory, the aim of which is to merge different stages of economic development into a single and comprehensive model of growth (Galor, 2005). Goldin and Katz put forward the notion that education is likely to supply skills that are required in order to meet the demand generated by technological progress (Goldin and Katz, 2007). Other work using a historical perspective provide further insights into the way that education and human capital can promote economic growth. In spite of different (and not necessarily mutually exclusive) views on the issue, improved human capital prompted by the Enlightenment might explain why the Industrial Revolution was mainly a European phenomenon (Landes, 1999, Mokyr, 2004 and Mokyr, 2010). Supporting this hypothesis is that a number of northern European countries had already achieved diffused literacy and numeracy by the early nineteenth century (A'Hearn, Baten and Crayen, 2009, Morrisson and Murtin, 2013). Following this line of reasoning, the central role of skilled labour in modern economic growth calls for a better understanding of the way that education systems have shaped human capital in the past (Hanushek and Woessmann, 2012).

Although between the sixteenth and the eighteenth centuries much of the improvement in education and literacy was sparked by private institutions, the rise of modern states and the will to provide mass education prompted the intervention of government policy. Whether to implement a decentralized education system versus a more centralized one became a crucial choice, because of

the intrinsic tension between private demand for education and externalities brought about by the accumulation of human capital (Mitch, 2013). Historically, different countries have reacted to a variety of economic and political factors in relation to schooling; hence it is quite difficult to identify the circumstances under which diverse education systems succeed or fail. Lindert holds that decentralized education fostered the development of human capital in Germany. 'Schools were founded locally, by local appointees, with the result that tax-based primary education flourished where the local demand was already stronger in the late nineteenth century' (Lindert, 2003, p. 332; see also Lindert, 2004, p. 88). Germany shared this virtue with the US, according to Goldin. However, 'the[se] virtues were not always intentionally so nor were they virtuous in all locations and situations, as in the case of local control and the use of property taxes' (Goldin, 2001, p. 265). These authors take a national and comparative perspective on the spread of education and the accumulation of basic human capital; yet, nowhere do they connect education policies in Germany and the US to regional inequalities in schooling. Such a connection is made by Go and Lindert. They point out that decentralized education 'made it easier to launch public education on a limited scale' in nineteenth-century US (Go and Lindert, 2010). At the same time, regional differences in affordability, local autonomy and political voice resulted in the uneven rise of schooling across US states.

Along the same lines, recent research looking at the reconstruction of routes to mass schooling in different regions of the world suggests that, under certain conditions, local autonomy in the provision of basic education is responsible for the limited accumulation of human capital. New case studies based on colonial Korea and the BRICs in the early twentieth century suggest that decentralized schooling can stifle educational outcomes – especially where restricted ruling elites dominate the local political scene in the context of remarkable regional disparities, institutional differences and socioeconomic inequalities (see Go and Park, 2012 and Chaudhary, Musacchio, Nafziger et al., 2012). Even the World Bank, an organization that in the past has strongly promoted the adoption of decentralized education, seems to be turning to a more cautionary stance

concerning the benefits of such policies (Fiske, 1996, Mansuri and Rao, 2013). Although new evidence on the benefits of decentralization is mixed, to say the least, a serious assessment of the potential benefits of more centralized systems is still lacking. Lindert himself wrote that, at a later stage of development, centralized education systems can play an important role in the diffusion of mass schooling by allowing backward and least-schooled localities to catch up with more advanced regions. Oddly enough, this hypothesis remains unexplored in Lindert's book, as the author himself admits (Lindert, 2004, p. 105).

Italy constitutes a unique case study for a better understanding of different education systems. The country was – and still is – characterized by large disparities in income and, even more, in basic human capital. A long-term perspective can reveal how decentralized and centralized education affected schooling across regions. In fact, a decentralized system was established in 1859, and endured – with minor changes – until 1911, when an important reform largely centralized the funding of education. Furthermore, studying Italy's education policy may shed light on several hypotheses on the long-term persistence of an impressive regional divide in human capital, which certainly slowed down the comparative performance of the country as a whole (Conte, Della Torre and Vasta, 2007, Felice, 2007, A'Hearn, Auria and Vecchi, 2011, Felice and Vasta, 2015; see Figure 1). Notably, the convergence process remained incomplete in the Interwar period, despite the fact that literacy measures are subject to an upper-bound equal to one.

[Figure 1 here]

The persistence over time of regional disparities in education is the key to a thorough understanding of Italy's development. Historiography has accentuated the role of public policy, and the will to maintain a decentralized education system until the early twentieth century: Zamagni blames the government for its late decision to intervene, taken only after 'the failure of the alternative' had become clear (Zamagni, 1993). Vasta pushes this argument forward. In his view, a

change towards centralization was urgent: decentralized primary schooling acted not only as a halt on modernisation, but also as a possible constraint for long-term regional convergence given the prominent role of human capital in the Second Industrial Revolution (Vasta, 1999). A'Hearn, Auria and Vecchi have recently reflected upon Italy's poor performance in human capital accumulation, but the role of the school system remains largely unexplored (A'Hearn et al., 2011). A new analysis on the different dimensions of the Human Development Index, conducted by Felice and Vasta, shows that 'convergence in education was significant in the Liberal Age mostly as a consequence of the huge differentials in 1871', but that 'much more could be done' (Felice and Vasta, 2015). In fact, between 1871 and 1911 the regions that converged more slowly were Calabria and Basilicata, those characterized by the lowest literacy rates after Italy had become a unified kingdom (Felice, 2014). This view seems to be supported by Battilani, who finds evidence of large disparities in tax revenues and public expenditures by municipalities across Italian regions after unification (Battilani, 2011). However, these findings have not yet been verified by looking at the role that the country's education system played in the accumulation of human capital across regions.

This paper bridges this gap by carrying out a new exploration of the role of Italy's primary school system (1861 – 1936). It seeks to answer the following research questions: did decentralized primary schooling inhibit regional convergence in education? And if so, did centralization improve the pace of convergence and the country's performance? The results are tied to a new interpretation of Italy's long-term regional disparities and of their potential determinants: human capital is found to be a central factor of growth across Italy's regions, especially as far as the period from the late nineteenth century to the Second World War is concerned (Felice, 2012). Therefore, understanding the determinants of human capital development is of twofold importance: on the one hand, this research sheds light on Italy's patterns and determinants of human capital accumulation, in line with the international research briefly outlined; on the other hand, it provides new insights into the potential causes of the country's long-term regional income disparities, a topic that is central to the historiography of Italy's long-term economic development.

Two different hypotheses are tested. The first is that decentralized primary education locked Italy's regions in a human capital trap: if municipalities were obliged to bear the burden of expenditure, poor and rural areas would not be likely to supply a desirable amount of schooling. This in turn would depress literacy and subsequent economic growth, and hence start a vicious cycle. Although the regions of Italy that lacked basic human capital were able to grow throughout the period analysed, their long-term economic and human development was retarded because of limits on basic education, and they lost ground with respect to rest of the country. The second hypothesis is that the Daneo-Credaro Reform, passed in June 1911, weakened the human capital trap and fostered the supply of education in the years following the Great War.

The results confirm the existence of a tight relationship between fiscal capacity and schooling. In line with the aforementioned hypotheses, this link was loosened by the Daneo-Credaro Reform. Furthermore, the direct impact of centralization was positive for the Southern regions of the country, but basically null in regions with fiscal capacity above the mean, thus favouring convergence. Italy's centralization of school funding (accompanied by a greater degree of administrative decentralization) fostered aggregate primary education by improving the supply of schooling in the South of the country.

2. Italy's decentralized education system and the shift towards centralization, 1859 – 1911

Italy's national primary school system was established by the Casati Law during the process of unification (1859) and was later extended to the other regions that became part of the Kingdom. Under this system, education was to be offered free of charge, proportional to the municipalities' fiscal capacity and according to their inhabitants' need. First-grade primary school (lasting two years) was mandatory for boys and girls. Although parents were formally obliged to comply with the rules, no sanctions were established by the law until 1877. As a result, the norms regulating compulsory education remained largely ineffective. Only municipalities exceeding 4,000 inhabitants, or where secondary education had already been established, were required to set up

second-grade schools, resulting in two additional years of primary schooling (see Coccìa and Della Torre, 2007).

Soon after the system was established, the Ministry of Education began to collect data and reports on the state of primary schooling across the country's provinces. The first inquiry, published in 1865, outlined the dramatic state of Italy's education (Ministero della Pubblica Istruzione, 1865). The inquiry was coupled with a statistical publication containing a great deal of data on the number and quality of teachers, schools, enrolments and actual attendance, public expenditure and salaries. This early account identified some of the major problems which would be addressed in the following decades. The most pressing issue was the presence of remarkable regional disparities in enrolments: only the northwestern provinces of Italy had Gross Enrolment Ratios (GER)[i] substantially larger than 50 percent in 1863 (Figure 2).[ii]

[Figure 2 here]

The inquiry blamed poverty and low living standards for the disappointing levels of attendance. Child labour was endemic to the countryside, especially during the summer. In some regions, children had to work for most of the year.[iii] City councils had difficulty promoting the diffusion of schooling for two reasons. First, their balance sheets were constrained: investing in new infrastructures and enforcing compulsory education was costly, and second, schooling was not perceived as a valuable investment. This was especially the case where schools had barely existed before the unification of the country. Consequently, a party promoting schooling could easily lose votes in future elections.

Poor-quality teaching was another discouraging feature of the system. However, as many of the inspectors admitted, teachers could not really be blamed for this. The salary they earned barely sufficed to survive: some of them had to give private lessons in order to have a decent standard of living. Furthermore, teaching methods were often obsolete. These were evidenced by the inquiry,

which highlighted the fact that individual and mutual teaching[iv] were still very much in fashion during the second half of the nineteenth century, limiting the scope for improvement during classes.

The report concluded with some recommendations on how to improve the school system (Ministero della Pubblica Istruzione, 1865, p. 497). Firstly, it strongly advised the government to strengthen sanctions for lack of attendance. Secondly, it put forward the idea of clustering different municipalities into *consortia*, partnerships that could be exploited in order to share the burden of school building – a point that would be taken up by policy-makers only in the early twentieth century. Thirdly, the inquiry pointed out the need to provide economic support to the most disadvantaged municipalities, so that they would be able to improve their school infrastructures. Fourthly, the working conditions of teachers should be greatly improved; otherwise the job insecurity and extremely low wages would continue to depress school enrolments because of poor teaching. Finally, the need to boost the opportunities for teacher training in order to employ more highly qualified teachers was stressed. The inquiry also predicted that private education would become more important over time and it would raise the country's educational achievements. In reality, enrolments in private schools only represented roughly 13.6 per cent of the total; this figure would soon decline, with private education ending up playing only a marginal role in Italy's overall system.

A further inquiry into primary education was conducted in the years 1868–1872 (Ministero della Pubblica Istruzione, 1873) and, following this, was discussed in depth by the supervisor of the report, Gerolamo Buonazia.[v] Buonazia noted those features that were widely known to depress schooling and the accumulation of human capital, but he also brought up a previously neglected angle, that is, the poor quality of school buildings. The inquiry also suggested a link between the poor performance of teachers and low wages. The salary of non-qualified[vi] rural teachers was often found to be below the minimum established by the Casati Law: 500 Lire for males and 333 for females (Vigo, 1971, p. 52). Although estimates of the average salary of teachers in Italy (492 Lire) in 1869-70

compare well with estimates of wages from the construction sector around 1871, the average *minimum* salary of teachers across Italy's regions was as low as 238 Lire (Vigo 1871, p. 51; see Table 1).

[Table 1 here]

Provincial figures indicate that teachers' average salary was slightly higher in the South than in the North, but a clear-cut regional divide can hardly be inferred from the data (Figure 3). Although the municipalities of the North hired more female teachers – who by law could be paid less than male teachers – the average salary does not seem to be correlated with the teachers' gender ratio. This suggests that gender bias did not drive regional differences in wages. Instead, both enrolments and the number of teachers per children are found to be negatively correlated with the average salary (Figure 4). This result suggests that, in the South, schools were rather elitist – few got education, but this was likely to be of good quality.

[Figure 3 here]

[Figure 4 here]

Although a good deal of attention was paid to the role of economic factors in explaining poor enrolment ratios and low attendance, the government continued to focus on the enforcement of formal norms – not least for political reasons and the pressure of right-wing parties and the Catholic Church against a more robust intervention. The latter largely opposed the reform because of the threat to local autonomy and the influence that the Church could exert thanks to private schools. The Right (Liberals, Nationalists, Conservatives) also opposed any reform of decentralized primary

education. While the importance of local autonomy was linked to ideology (and to the idea of freedom) the disastrous condition of Italy's state budget also played a major role.

In 1877, the Casati Law was amended by the Coppino Law (see Cives, 1990, p. 66). The latter was passed in order to enforce compulsory attendance in the rural and most disadvantaged areas of the country, while the years of compulsory schooling were raised to three. A third inquiry, again supervised by Buonazia, followed in 1878. The story was still the same. However, for the first time an official inquiry adopted a more robust stance towards the possibility that the state could play a more significant role in the provision of basic education, possibly as a result of the different political environment after the Left had come to power in 1876. Buonazia pointed out that the government had always generously funded secondary schooling.[vii] Therefore, he suggested, a share of these resources could be redirected to fund primary schooling so that issues brought about by economic backwardness could be addressed more effectively.

The Torraca inquiry (Ministero della Pubblica Istruzione, 1897) provided some very picturesque reports on the state of Italy's schools, with a particular focus on schoolhouses. The inspector from Susa found that some schools had been set up in stables, where 'the noise of animals – oxen, donkeys, sheep, chickens etc. – was a continuous source of distraction'. Another from Vasto described 'miserable and dirty rooms that lacked air and light, and which were dripping moisture'. The report by an inspector from Gaeta sheds light on the reasons why schools were often called 'killer schools': 'many [children] were covered with vivid and purulent sores, the stench of which infected the air: I made sure the children would leave me alone'. Administrative inefficiencies were also noted. Sometimes the schools were set up in leased buildings. The contracts for these were not meant to save money. Instead, the local elites typically forced the city councils to pay a rent higher than the market price in order to establish a school in the buildings of friends. In this way, the elites could reinforce and strengthen their patronage network (Briggs, 1978, p. 45).

Thus it was that on the eve of the twentieth century, state intervention came to be seen as the only viable solution to the problem of Italy's primary education. Enrolments in private schools had

dropped to 7.3 percent of the total, and the Torraca inquiry had just exposed the poverty of pedagogy in private institutions.[viii] Moreover, a demand-side shift was very unlikely to improve educational attainments or to reduce regional disparities in schooling. This last can be seen, for example, in the fact that the first wave of income growth affected mainly the northwest regions of the country. It was in this context that the state slowly started to step in, by approving the Nasi and the Orlando Laws (1903 and 1904 respectively) and by passing a Special Law for the south of Italy (1906). A further decisive step was taken when the Corradini inquiry was published in 1910. This particular study played a crucial political role in advancing and accelerating the process that led to centralized primary education – so much so that the new bill, which would be approved soon after the inquiry was published, was often called the Corradini Law within political circles (Cives, 1990, pp. 55 – 81).

The Daneo-Credaro[ix] Bill was passed on June 4, 1911. This reform, the result of a delicately drawn compromise between competing ideological and political views on education and the role of the state, significantly modified the educational system. The parliamentary debates of 1910 reveal that not even Daneo and Credaro were in total agreement on some specific points concerning the new law. A look at the reform reveals the mixed character of Italy's new primary schooling system. The most controversial feature of the reform was probably the revised role of the provincial school board: the *Consiglio Scolastico Provinciale* (CSP) functioned as an intermediate body between the municipality and the state. The *Consiglio* was redesigned to manage the resources allocated to primary education and to hire teachers. It allowed a great deal of administrative decentralization that largely limited the power of the city councils. However, the system was centralized financially far more than it had ever been: the state was fully committed to paying the teachers' salary. By contrast, the municipalities still largely managed the building of schools, and they could apply for interest-free state loans in order to do this. According to the bill, the municipalities that were included in the CSP system had to transfer an amount of money equal to their previous year's budget to the Treasury (art. 17). The government would then redistribute these funds to the

provinces (art. 19), which would in turn finance education (art. 20). It is worth noting that provincial capitals and other major administrative centres were excluded from the CSP system. However, every city could formally apply to be included in (or excluded from) its relative CSP within three years of the approval of the reform.

The last educational reform prior to WWII was conceived by Giovanni Gentile and approved when Fascism was on the rise (1923). It adopted a more elitist view of education. However, the changes concerned mainly secondary education, while primary schooling was left largely intact, especially as far as the funding of schools was concerned. In fact, state aid was improved and the system further centralized. Therefore, the effect of the Daneo-Credaro Reform endured until WWII broke out.

3. Education policy, regional convergence and aggregate schooling: an econometric model

Since the aim of the paper is to understand whether the decentralization of primary schooling hampered the development of education across Italy's regions, its focus is on the way schooling was supplied. First, the reforms of the education system likely had more immediate effects on the number of teachers and enrolments. Second, focusing on inputs into schooling is likely to scale down problems of endogeneity, which are more likely to rise by regressing output measures on the municipalities' fiscal capacity.[x] Finally, the supply of schooling should not be directly affected by the migration of human capital abroad, since investments in education normally respond to local demand-side conditions, which can be captured by other control variables. Therefore, the role of decentralized and centralized primary education is assessed by examining the Gross Enrolment Ratio (GER) and the number of public-school teachers per 1,000 children aged 6 to 10. These indices provide a comprehensive picture of the way in which the government influenced the development of schooling.[xi] Enrolments are naturally subject to an upper bound. However, the years of compulsory schooling were continuously raised by the law and, as a consequence, the evidence on convergence should not be biased by the nature of the index. Moreover, the figures concerning the

index of dispersion presented in the next section show that a great deal of convergence in enrolments took place between 1920 and 1930, when the scope for convergence was more limited, according to our expectations on the bounded nature of the variable. The northern regions were already characterized by values around 100 percent at the beginning of the twentieth century: hence, a steady catch-up should be observed before 1900. Slower convergence is expected in the Interwar period, when the southern regions came close to 100 percent enrolments; yet, between 1921 and 1928, the dispersion around the mean dropped by an extent that had had no parallel in the nineteenth century.

Following Clay, Lingwall and Stephens (2012) the following model is used (Equation 1), where logs are taken in order to present the results in terms of percentage change with respect to the mean of the dependent variable:

(1) $log(sch_{it}) = \beta_1 fiscal_{it} + \beta_2 ref_t + \beta_3 (fiscal_{it} * ref_t) + \beta_5 \delta_i + \beta_6 (\delta_i * time_t)\ \varepsilon_{it}$

First, the baseline specification explores the hypothesis that a tight link existed between municipal fiscal capacity and schooling: if this was the case, β_1 should be positive (negative in the case of children per teacher) and significant. Secondly, a reform dummy is introduced to check if observations in post-1911 years are characterized by a premium on teachers and enrolments, which is captured by β_2. Lastly, an interaction between fiscal capacity and the reform dummy is included to see whether the hypothesized link between fiscal capacity and education was weakened after the Daneo-Credaro Reform. Once the interaction term is added, the marginal effect of fiscal capacity depends on the value of the reform dummy (Equation 2) so that the same model can capture the effect of fiscal capacity before and after 1911:

(2) $\partial log(sch_{it}) / \partial fiscal_{it} = \beta_1 + \beta_3 ref_t$

If the Daneo-Credaro Reform weakened the effect of fiscal capacity after 1911, β_3 should be negative and significant, with its magnitude being greater the more it offsets the relationship between fiscal capacity and schooling found in pre-1911 years. Instead, the marginal effect of the Daneo-Credaro Reform (Equation 3) can be divided into a direct premium on the intercept and a

coefficient that will be connected to the level of fiscal capacity:

(3) $\partial log(sch_{it})/\partial ref_t = \beta_2 + \beta_3 fiscal_{it}$

The model relies on regional fixed effects (δ_i) as well as regional trends ($\delta_i * time_t$) in order to control for the passing of time. As Clay et al. show for US states, it is difficult to claim that events common to all Italian regions influenced the development of primary schooling prior to centralization. The historiography of Italy's development shows that the country's regions followed different paths of growth, as measured by real GDP per capita. Furthermore, education was provided through a decentralized system, which certainly brought about specific regional patterns of mass-schooling diffusion. It is worth noting that the constant is omitted to avoid the dummy-variable trap. The second specification (Equation 4) allows fiscal capacity to have a non-linear effect on schooling, because an improvement from low to medium-range fiscal capacity might have mattered more for schooling than further increases, especially in the case of the naturally-bounded enrolment ratio:

(4) $$log(sch_{it}) = \beta_1 fiscal_{it} + \beta_2 ref_t + \beta_3 (fiscal_{it} * ref_t) + \beta_4 fiscal^2{}_{it} + \\ + \beta_5 (fiscal^2{}_{it} * ref_t) + \beta_6 \delta_i + \beta_7 (\delta_i * time_t)\ \varepsilon_{it}$$

With this model, the marginal effects of fiscal capacity (Equation 5) and that of the reform dummy (Equation 6) become respectively

(5) $\partial log(sch_{it})/\partial fiscal_{it} = \beta_1 + \beta_3 ref_t + 2\beta_4 fiscal_{it} + 2\beta_5 ref * fiscal_{it}$

and

(6) $\partial log(sch_{it})/\partial ref_t = \beta_2 + \beta_3 fiscal_{it} + \beta_5 fiscal^2{}_{it}$.

In the last specification used, a vector X of control variables, which is described in the next section, is included among the regressors.

4. Sources

The data and evidence used in this work are drawn from largely unexplored primary sources. The most important of these are the state inquiries on primary education, published regularly between

1865 and 1923. These report a large amount of data, which in turn is complemented by other statistics on education published on a regular basis by the Italian government from 1864 to 1941. Both the qualitative and quantitative evidence on Italy's primary schooling is drawn entirely from these publications. The reports were drafted by local inspectors, but the Ministry coordinated their publication in the form of national inquiries and statistics that were often discussed by an expert on the topic. Ideology and political ideas certainly influenced the information provided, but it is hard to claim that any specific agenda actually existed. In fact, the evidence provided by the inquiries was very often against the political will of the party in power. For example, the government led by the Right (1861 – 1876) sought to promote local autonomy, private schools and a lack of state intervention. Although the final reports attached to the inquiries published in 1865 and 1873 did not explicitly contradict this agenda, they highlighted several aspects of the system that required a change in education policy.

Data might also be subject to errors and omissions: the qualitative and quantitative information provided is the result of research plans that sought to collect data on every single municipality of the country, because sampling methods did not exist (De Fort, 1996). However, a long-term analysis of these sources can reveal persisting patterns that are unlikely to be influenced by ideology and political change or by measurement errors. A potential, intrinsic bias in the sources would reduce the picture of regional disparities in schooling: the reports written by inspectors from the north of Italy are normally more critical than those provided by employees in the South, because the context is likely to influence subjective evaluations to a very large extent.

The municipalities' fiscal capacity (in per-capita terms) is reconstructed by looking at government publications concerning their budget, the figures of which are conveniently published by provinces and regions. Data are reported in current Lire. These were converted into 1938 constant prices by drawing on the deflator published by Fratianni and Spinelli (2001). Most of the information is directly available, but data from the early years (1861-1871) for Veneto and Lazio had to be estimated, because these regions became part of the Kingdom of Italy only in 1866 and 1870,

respectively.[xii] The proxy for the municipalities' fiscal capacity is obtained by summing up different kinds of ordinary revenues,[xiii] net of capital flows and other special revenues. The data concerning expenditure on education are also collected from this source.

The vector of control variables includes the share of labour force in agriculture, which proxies the opportunity cost of education: the data were obtained from Felice (2009) and SVIMEZ (2011), but the figures for the year 1871 had to be collected from primary sources and were elaborated following Zamagni (1987) and Felice (2011). Child labour is excluded: although it captures a similar effect, it can also bring about endogeneity, because the absence of schools can push parents to opt for quantity rather than quality. Population density, drawn from population censuses, captures the effect of agglomeration and urbanization. Data from the Ministry of Education are used in order to calculate the share of children aged 6 to 10 in private schools, which is used to capture the potential relationship between public and private education. Charitable expenditure as a share of total municipal budget is used to investigate the effect of other types of social spending on schooling, and it is also elaborated from data on the municipalities' balance sheets. Finally, a dummy for the year 1928 serves to control for potential negative effects on schooling due to WWI. The cohort in primary school during 1928 was the only one born during the Great War in the dataset compiled.

Another important control variable has been used in order to deal with a potential problem underlying the data on the municipalities' revenues. The city councils were allowed to establish surtaxes in order to fund investments in public goods that, according to the law, had to be provided at the municipal level. The problem arises because local tax rates were highly discretionary. Because of this, A'Hearn, Auria and Vecchi have put forward the view that the amount of investment in schooling was not, in fact, driven by the municipalities' fiscal capacity. According to their hypothesis, the different municipalities had different preferences concerning the optimal level of investment in human capital, and this investment, in turn, was dependent on the extent to which land and social inequality led to political fractionalization. For example, the south of the country did not invest as much as it could have in education, the result of the ruling elites' reluctance to provide

public goods to the majority of its citizens. By contrast, the ruling class of the North – characterized by fewer social inequalities and by a higher level of social capital – converged on a larger share of resources being invested in schooling. Such a model implies that the differences observed in per capita municipal revenues across Italian regions were due to the amount of resources that municipalities decided to spend on education, and not the other way around.

According to the authors, this pattern is described by the ratio between municipal surtaxes on land and property and municipal consumption duties. The larger share of income due to land surtaxes in the northern regions suggests that the governing elites (mostly affected by land and property taxes) were more willing to pay in order to provide mass education and widely accessible public goods. Although this effect could be captured in a more effective way by comparing municipal revenues from surtaxes with state tax revenues, data on the matter could not be retrieved for the Interwar period. Therefore, the index suggested by A'Hearn, Auria and Vecchi must be used as the only viable proxy for local tax policy and, indirectly, for proxying local preferences towards education. Table 2 below shows the summary statistics, for the panel made up of 16 to 18 regions (the number of regions grew in the Interwar period) and 11 benchmark years, between 1863 and 1936.

[Table 2 here]

5. Results

An index of the municipalities' fiscal capacity in 1877 and 1928 is displayed in figure 5: the data are aggregated by region and were divided by the regional population. Per capita fiscal capacity differed considerably across regions, with no sign of convergence over the long run. In fact, an index of dispersion developed following Williamson and Felice and Vasta takes value 0.369 in 1895, 0.312 in 1912 and 0.379 in 1928.[xiv] These findings suggest that poor areas were scarcely able to afford to invest in education under the system of decentralized primary schooling, and that this situation did not improve in the late nineteenth and early twentieth century.

[Figure 5 here]

Figure 6 illustrates the regional distribution of the municipalities' expenditure on education divided by the number of children subject to compulsory schooling. The index of dispersion suggests that the Daneo-Credaro Reform had an impact on per capita expenditure after the Great War. Between 1895 and 1912, the index grows from 0.448 to 0.656 (thus highlighting divergence) while from 1912 to 1928 it drops to 0.313. This suggests that centralization truly fostered convergence in the number of resources allocated to the development of education across Italy's regions.

[Figure 6 here]

Table 3 presents trends of sigma-convergence across Italy's regions, with a focus on the number of children (aged 6 – 10) per available public-school teacher and gross enrolments. A clear-cut pattern emerges from the series: convergence in the number of children per teacher took place for some time after unification, mainly as a result of large disparities inherited from pre-unification states. Later, convergence slowed: while the child-teacher ratio diminished in most of the northwestern and central states, the growth in the number of teachers in the South came to a halt. Instead, between 1907 and 1921, the dispersion around the mean dropped by nearly 50 percent and declined more slowly in the following years. This somehow anticipated a similar trend in enrolments. A clear discontinuity in the GER can be seen in 1928.[xv] This was possibly by the Daneo-Credaro reform, and by the enhanced quality of education due to a reduced child-teacher ratio.

[Table 3 here]

Table 4 shows the results based on econometrics.[xvi] First, the basic model introduced by Equation 1 is discussed, while more comprehensive specifications are analyzed later. Column 1 shows that the positive relationship between fiscal capacity and the number of teachers per 1,000 children was significant (first row) and that it was largely weakened by the introduction of centralized primary schooling in 1911 (the marginal effect of fiscal capacity basically declined from 24% to 4.7%). The reform dummy is associated with a positive premium on schooling in post-1911 years; yet, the net marginal effect of the Daneo-Credaro Reform is connected to the given level of fiscal capacity (see Equation 3). Therefore, in order to evaluate the econometric results, different thresholds of fiscal capacity are taken into account. When evaluated at the 1907 mean (0.975 Lire at 1938 prices), the effect of the reform is negative but negligible (-3.9% teachers per 1,000 children). The marginal impact of the reform dummy is positive for values of fiscal capacity lower than 0.80, i.e. for just a few regions – but the magnitude of these effects remains small according to this basic specification.

The same holds true when the dependent variable is the logarithm of gross enrolments. The reform has a positive marginal effect only for values of fiscal capacity lower than 0.70: given the level of municipal fiscal capacity across regions in 1907, only enrolment ratios in three regions could benefit from centralization on the eve of the First World War according to the baseline model – while the effect on most of the richest regions would be neutral at best, or negative. Furthermore, the relationship between fiscal capacity and enrolments turns out to be negative in post-1911 years, while we expect it to be either positive but weaker than before, or close to zero: why the unexpected sign? Without the quadratic term of fiscal capacity, the baseline model can hardly capture different marginal effects that vary according to the level of fiscal capacity at hand, and hence may suffer from omitted variable bias: the richest regions (mainly the northwest and Lazio) experienced a spurt in fiscal capacity after the Great War, while the central and southern regions were largely left behind. At the same time, gross enrolments in the best-schooled regions declined to a steady-state of about 110 percent, mainly as a result of a reduced number of over-aged pupils enrolled; instead, the GER in some of the regions of the centre and the South grew a lot after 1911:

some of them overshot the upper bound of 100 percent by 1921. Therefore, growing fiscal capacity after 1911 is associated with declining or steady enrolments *within* regions, which explains the large and negative coefficient.

Columns 3 and 4 introduce the quadratic term of fiscal capacity to capture its non-linear effect. The coefficient of fiscal capacity before and after the reform has now the expected magnitude. When the quadratic term is taken into account, the net post-1911 marginal effect of fiscal capacity on enrolments is still negative, but reduced and in line with the expected negative correlation discussed above (-2 to -9%). The net effect of the reform becomes positive for values of fiscal capacity below 0.90 when the number of available teachers is concerned, and 0.82 for the GER. However, this second specification still fails to control for demand-side factors and other potential omitted variables.

The last model (columns 5 and 6) introduces a vector of covariates in order to reduce this bias. When the number of teachers per 1,000 children is taken into account (column 5) the marginal effect of fiscal capacity after the reform is now positive for *any* of given level of $fiscal$, and greatly reduced with respect to pre-1911 years (as expected). The effect of the reform dummy is *always* positive, and especially so for values of fiscal capacity below 0.90 (the marginal effect ranging from 2% to 15% depending on the region).[xvii] Basically, all the Southern regions (plus Veneto, but excluding Campania) benefitted to some extent from the reform according to this full model. When enrolments are concerned, the marginal effect of fiscal capacity declines considerably in post-1911 years, but remains positive as expected, while the impact of the reform dummy is positive for values of fiscal below 0.90 (with an increase of 5 to 15% for the five most disadvantaged regions after 1907, which is a substantial effect).

The new "rules of the game" established by the Daneo-Credaro Reform had an impact on the supply of teachers thanks to the pay rise that it introduced, which had to be funded entirely by the state; additionally, it strengthened the supervisory role of the provincial schooling boards in matters such as recruitment and lay-off. The combination of these two features led to the substantial impact

highlighted by the econometric results. A higher quality of schooling, in turn, positively influenced enrolments. These were also likely to be fostered by a more decentralized administrative system, where the role of the provincial schooling board was strengthened. As the inquiries on primary schooling suggest, when control and supervision were exerted by the state, these provincial bodies had a mere advisory role, and proved to be quite ineffective in monitoring the development of schooling. Some of the poorest municipalities had little interest in pursuing higher enrolments and universal education. By contrast, when the schooling boards were truly empowered, this institutional bottleneck could be finally overcome.

6. Conclusions

The problem of Italy's regional disparities is more pressing today than ever before. This research investigates the education system and its influence on regional disparities in human capital, largely inherited from pre-unification states. It argues that decentralized primary education slowed convergence up to the Great War, because of the relationship between the supply of schooling and the municipalities' fiscal capacity: a human capital trap. The system was largely centralized in 1911 as a result of the Daneo-Credaro Reform, and the evidence shows that the new law constituted a step forward. The trap was weakened by reducing disparities in expenditures and by scaling down the importance of local available resources for investments in schooling. The 1911 reform had a positive influence on schooling. Interestingly, the poorest regions benefitted the most from it. Instead, the model predicts that Northern regions were left largely untouched. The different effect of the reform across regions is confirmed by descriptive evidence on regional convergence in schooling: to be sure, overall sigma-convergence accelerated substantially after 1921.

Despite this positive impact, the effect of the reform on schooling was constrained by a number of factors. The Great War and the Spanish flu might have had disruptive effects on its implementation and on the accumulation of human capital. After that, changes in the political arena and the growing attention paid to the military sector at the end of the 1930s circumscribed the scope and

effectiveness of the reform to just a few years – roughly between 1920 and 1935. This limited impact was unable to fully re-shape the pattern of human capital disparities observed across Italy's regions. This leaves us with the question: what if Italy's educational system had been centralized before 1911? This paper has provided a preliminary answer. According to the estimated marginal effect of the reform, which is tied to the level of fiscal capacity, the introduction of a centralized system in 1877 would have had a positive impact on 13 out of 16 Italian regions – and on Southern municipalities in particular. According to the finest econometric model used, both the number of available teachers and enrolments would have increased by c. 8 to 25 percent (depending on the region concerned) if the reform has been passed in 1877. These results may actually underestimate the likely impact of centralization in 1877, because they are based on post-1911 trends – when the scope of convergence was more reduced than at the end of the nineteenth century.

Indeed, by 1911, the several reforms introduced after the turn of the century certainly made a first contribution to the development of Italy's human capital. If the state had intervened earlier and more decidedly, one may venture, the human capital gap across Italian regions on the eve of the Second World War might have been reduced to a large extent, and the country's overall economic growth largely improved. In any case, more research is welcomed in the field. In particular, the construction of a counterfactual on the effect of decentralized versus centralized schooling would shed further light on the issue.

In fact, Lindert's unexplored hypothesis that latecomer countries may benefit from more centralized education systems is confirmed by the Italian case. While decentralized education is prone to a trade-off between the aggregate growth of schooling and regional convergence, Italy's economic history of education shows that centralized schooling brought about both. This confirms the recent hypothesis of Felice (2014) and Felice and Vasta (2015) on the role played by the education system in fostering passive modernization, i.e. improvements in economic and human development that would not be prompted by local elites. Nineteenth-century Italy presented very large regional economic inequalities, especially when diverse dimensions of economic development

are taken into account. The North-South gap in literacy and schooling stands out after the unification of the country. These features may explain why, in the absence of a strong redistributive mechanism, delocalized state control and different socioeconomic and institutional features, Italy's education system did not work well until it moved towards centralization.

The issue of regional disparities remains central both in Italy's economic history and in today's public policy. This paper suggests that, although a decentralized administrative system can theoretically provide powerful incentives to promote economic activity and enhance the meeting of supply and demand, it also conceals substantive dangers from a regional, long-term perspective.

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Figures

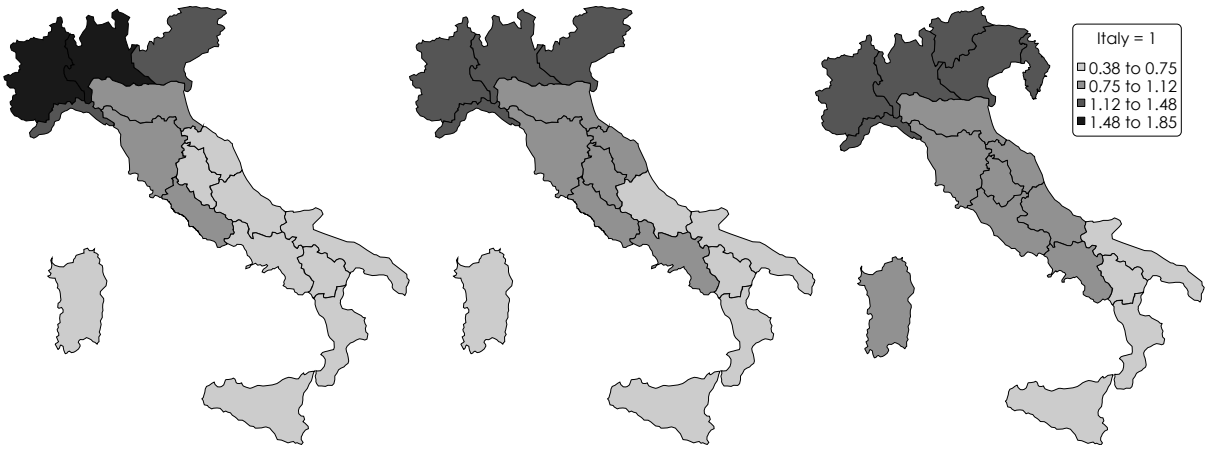

Figure 1: Adult Literacy Rates (15+) across different regions (Italy = 1) in 1871, 1911 and 1931.
Source: Vasta (mimeo). Notes: maps were drawn by the author at historical borders.

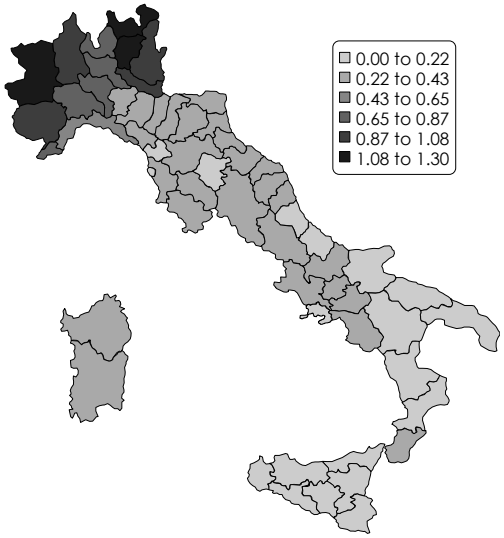

Figure 2: Children enrolled in state primary schools as a share of those aged 6 – 10, 1862 – 63.
Source: Ministero della Pubblica Istruzione (1865) for enrolments; census data for population aged 6 to 10.
Notes: data on children aged 6 – 10 refer to 1861. The datum for Lazio and Veneto (centre and northeast of Italy) is not reported in 1870 as these regions became part of the Kingdom of Italy in 1866 and 1870 respectively.

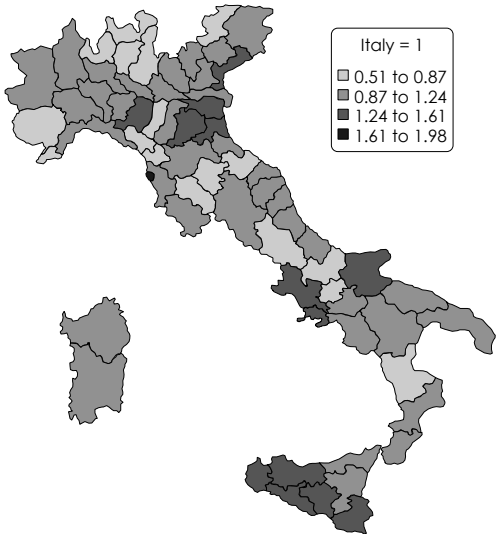

Figure 3: The salary of teachers (Italy = 1) across Italy's provinces, c. 1870.

Source: Ministero della Pubblica Istruzione (1873).

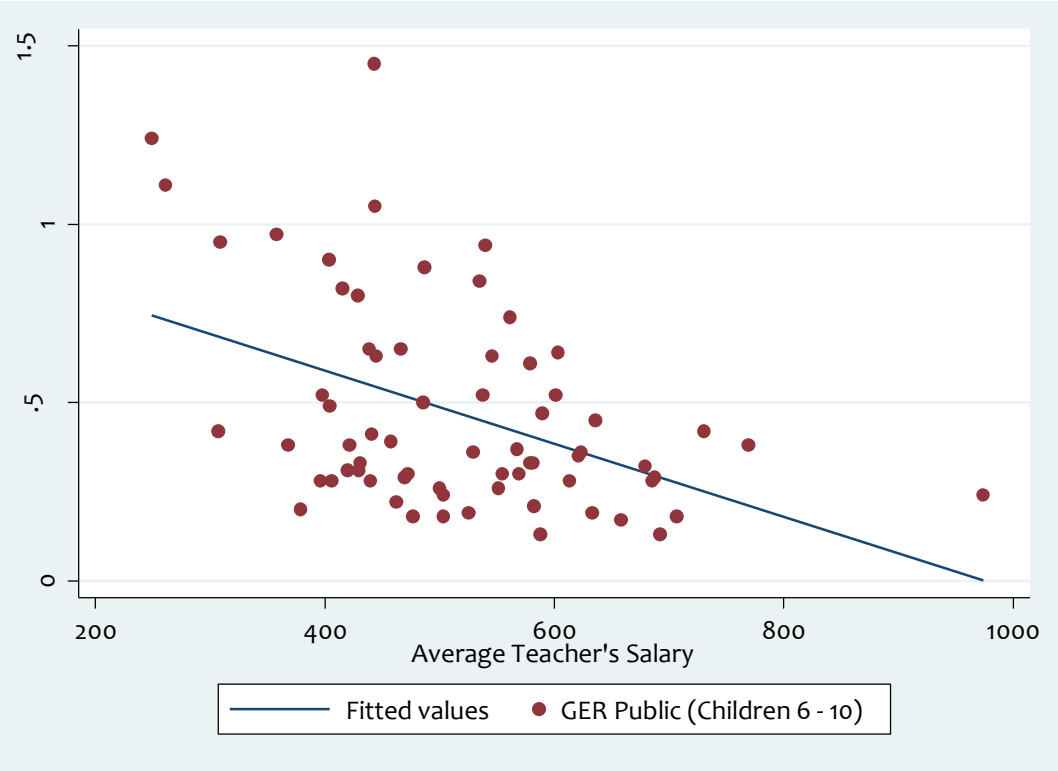

Figure 4: The salary of teachers and the Gross Enrolment Ratios, c. 1870 (provincial data).

Source: Ministero della Pubblica Istruzione (1873).

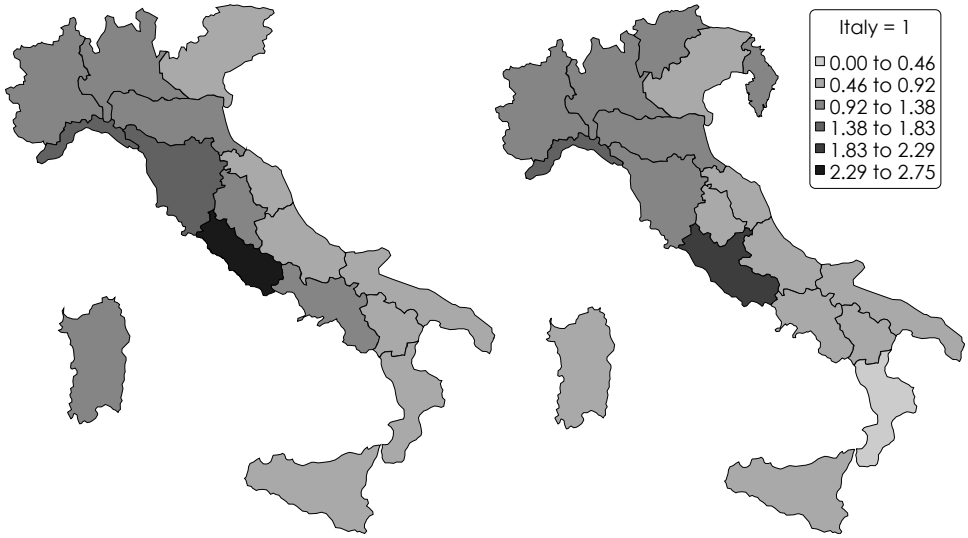

Figure 5: Municipalities' available resources (aggregated by region) divided by regional population in 1877 and 1928 (Italy = 1).

Source: Ministero dell'Agricoltura Industria e Commercio (various years) for financial data; census data for population.

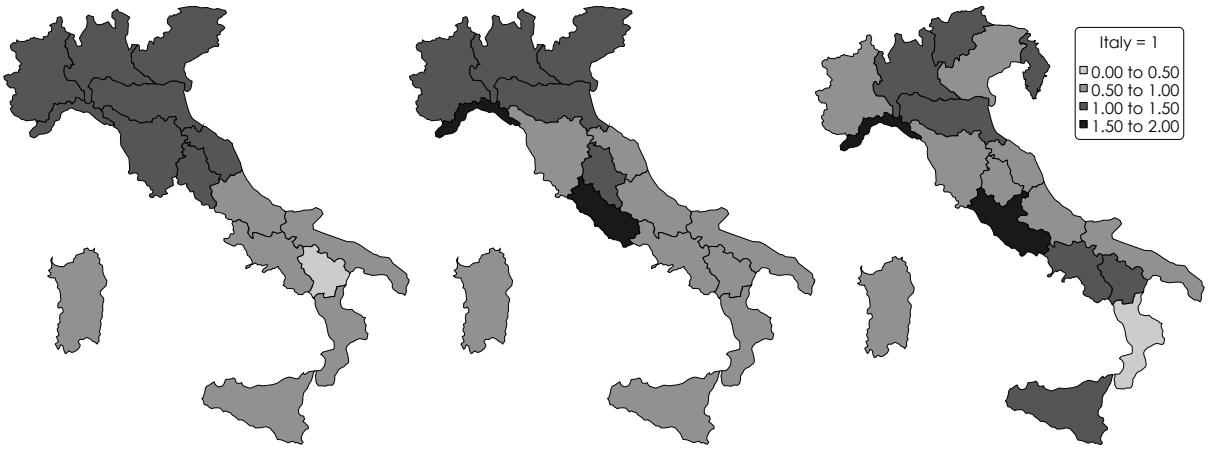

Figure 6: Expenditure on education per child aged 6 – 10 in 1870, 1895 and 1928 (Italy = 1).
Sources: see Figure 4. Note: the region of Lazio was not part of the Kingdom of Italy in 1870.

Tables

Table 1: Average and minimum annual salary of primary-school teachers in Italy (1869 – 70) compared to wages in other sectors (1871). Source: Ministero della Pubblica Istruzione (1873). Figures on wages in other sectors are kindly provided by Felice (mimeo). The minimum wage is obtained from Vigo, 1971.
Notes: the average salary in each province is obtained by dividing the wage bill by the number of teachers reported (The datum for Italy is a weighted average based on 69 provinces, in current Lire). The province of Rome (Lazio) was not part of the Kingdom of Italy in 1869 – 70, therefore it is excluded.

Textile	Commerce	Construction	Primary School Teachers (Mean)	Primary School Teachers (Minimum, 1863)
274	414	453	492	238

Table 2: Summary statistics, 1863 – 1936. Sources: see text.

Variable	Min	Max	Mean	SD	CV
Teachers per 1,000 children (Public Schools)	3.16633	37.37455	17.26328	6.843871	0.396441
Gross Enrolment Ratio (Public Schools)	0.112842	1.428216	0.758849	0.312385	0.411657
Fiscal Capacity (per capita, at 1938 Prices)	0.161104	2.995647	0.974966	0.545674	0.559685
Ratio: Land Surtaxes on Consumption Surtaxes	0.109787	3.623405	1.098206	0.740707	0.67447
Share of LF in Agriculture	26.88571	85.62825	60.60565	11.57737	0.191028
Population Density	25.32	271.09	115.6202	54.03476	0.467347
Share of Children 6 - 10 in Private Schools	0.003922	0.141821	0.039767	0.030269	0.761151
Charity Expenditure % Municipal Budget	0.001304	0.189673	0.047402	0.035879	0.756905

Table 3: Indices of dispersion around the mean for two measures of schooling, 1877 – 1935. Source: see text.

Index / Year	**1877**	**1885**	**1895**	**1907**	**1921**	**1928**	**1930**	**1935**
Child-teacher	0.372	0.306	0.339	0.452	0.248	0.226	0.191	0.195
GER	0.454	0.395	0.344	0.236	0.305	0.139	0.115	0.117

Table 4: Panel-data analysis, 1862 – 1836. Notes: robust p-values in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

Variables (1 unit increase in X = 100* β increase in Y)	(1) Teacher per 1,000 Children (Log)	(2) GER (Log)	(3) Teacher per 1,000 Children (Log)	(4) GER (Log)	(5) Teacher per 1,000 Children (Log)	(6) GER (Log)
Fiscal Capacity (at 1938 Prices)	0.2438***	0.2365***	1.1826***	1.4524***	0.9367***	1.0923***
	(0.001)	(0.009)	(0.000)	(0.000)	(0.000)	(0.000)
Post-1911 Dummy	0.1528**	0.2716***	0.6116***	0.8694***	0.4442***	0.5416***
	(0.024)	(0.003)	(0.000)	(0.000)	(0.008)	(0.007)
Fiscal Capacity x Post-1911 Dummy	-0.1966***	-0.3932***	-0.9857***	-1.4217***	-0.6932**	-0.8482***
	(0.003)	(0.000)	(0.000)	(0.000)	(0.011)	(0.008)
Fiscal Capacity Squared			-0.3847***	-0.4979***	-0.2957***	-0.3665***
			(0.000)	(0.000)	(0.002)	(0.000)
Fiscal Capacity Squared x Post-1911 Dummy			0.3339***	0.4348***	0.2513**	0.2649**
			(0.000)	(0.000)	(0.010)	(0.022)
Ratio: Land Surtaxes on Consumption Surtaxes					0.0617	0.0579
					(0.153)	(0.258)
Share of LF in Agriculture					-0.0089	-0.0092
					(0.209)	(0.193)
Population Density					-0.0025	0.0028
					(0.180)	(0.325)
Share of Children 6 - 10 in Private Schools					0.1622	0.7479
					(0.882)	(0.416)
Charity Expenditure % Municipal Budget					-0.8267*	-2.0038***
					(0.090)	(0.001)
Cohort Born during Great War					-0.0307	-0.1846***
					(0.200)	(0.000)
Regional FE	Y	Y	Y	Y	Y	Y
Regional Trends	Y	Y	Y	Y	Y	Y
Nonlinear Effect of Fiscal Capacity	N	N	Y	Y	Y	Y
Control Variables	N	N	N	N	Y	Y
Observations	182	184	182	184	182	182
Adjusted R-squared	0.998	0.938	0.998	0.951	0.998	0.959

[i] GER is defined as the total number of pupils enrolled as a share of pupils aged six to ten (it does not account for actual attendance).

[ii] The picture does not change when actual attendance (normally monitored in May) is taken into account).

[iii] In regions like Tuscany the grain-harvesting during summer months was augmented by grape-harvesting, olive-harvesting and chestnuts collection during the whole of autumn. This basically left only a few months for schooling.

[iv] The individual method consisted of face-to-face interaction between the teacher and each student within the class. Mutual teaching meant the teacher instructed a group of students whom, in turn, would be able to teach the rest of the class.

[v] Buonazia was an Italian pedagogue, who took charge of state inquiries on schooling under the Ministry of Public Education during the 1860s and 1870s.

[vi] Non-qualified teachers were defined as those who had not attended normal schools and had not acquired a formal degree.

[vii] Secondary education was indeed centralized and funded by the state – which was connected to the elitist view of the Right (1861 – 1876) that the state had to support those who would rule the country in the future, while the education of the masses was a minor concern for the central government. Furthermore, the Right sought to invest in national railways and focused on a tight control of the state budget, which further reduced the amount of resources that could be allotted to primary schooling.

[viii] According to the report, this happened mainly because limited state control on classes taught by the clergy, with its focus on catechism.

[ix] Edoardo Daneo and Luigi Credaro were ministers of education in 1909-1910 and 1910-1914 respectively.

[x] Fiscal capacity (tax revenues) was recorded yearly and known by the municipalities. Therefore, it was likely to affect schooling rapidly, because teachers could be hired quickly and schools could be easily opened by using and renting existing buildings. By contrast, the potential effect that primary schooling had on fiscal capacity (if any) would take years to unfold, and depended on the influence of – and interaction with – a variety of demand-side factors.

[xi] Although private education played some role in the early stage of Italy's development, its share declined quickly over time. Additionally, private schooling was marginally affected by the major reforms that led to centralization – hence it will be taken into account only as a covariate in the econometric analysis.

[xii] It has been assumed that the fiscal capacity of Veneto compared with its peer regions was constant between 1863 and 1870. First, the value of Veneto in 1870 was divided by the simple, un-weighted mean of its peers' fiscal capacity: the regions chosen were those of the Centre of Italy, Lazio excluded. This has been used to estimate the value of Veneto's fiscal capacity in 1863. The same procedure has been used to reconstruct the value of Lazio's fiscal capacity in 1863 and 1870, starting from the ratio between Lazio and the regions of the Centre (Veneto included) in 1877.

[xiii] Ordinary revenues included property rents, taxes from various sources, surtaxes on land and consumption and other minor items.

[xiv] See Williamson, J. (1965). Regional Inequalities and the Process of National Development: a Description of the Pattern. *Economic Development and Cultural Change* 13, 3-84. and Felice, E. and Vasta, M. (2015). Passive Modernization? The New Human Development Index and Its Components in Italy's Regions. *European Review of Economic History* 19. The index is calculated as: $\vartheta = \sqrt{\sum_{i=1}^{n}\left({}^{y_i}/_{y_m} - 1\right)^2 * {}^{p_i}/_{p_m}}$ where y denotes the index concerned and p the population for a given region (i) and for Italy (m). The index is basically a weighted coefficient of variation.

[xv] A considerable convergence in enrolments took place between 1895 and 1907. Although the education system was still largely decentralized, the round of interventions brought about by the special laws of the years 1903-1906 might have had an important short-term impact, which was subsequently shattered by WWI. By contrast, the sigma-convergence in enrolments after 1921 proved to be long lasting.

[xvi] The joint significance of the coefficients of interest (fiscal capacity, the reform dummy and their interaction) is tested through an F-test, and holds in all specifications at 1% or 5% level. The same is true for more comprehensive specifications, where the quadratic term of fiscal capacity is added (see text).

[xvii] The marginal effect of the reform is close to null at the mean of fiscal capacity at 1938 prices, which is equal to 0.975 Lire).