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# Italy's regional inequality over the long run (1891-2001): linking indirect estimates with official figures, and implications

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## Introduction

The aim of this paper is to present and discuss the pattern of regional inequality in Italy, from the end of the nineteenth century until our days. Value added estimates for the Italian regions, in benchmark years from 1891 until 1951, are linked to those from official figures available from 1971, in order to offer a long-term picture. It is worth anticipating that the 1891-951 estimates are not entirely satisfactory, but at the present stage of research they are comparable to those available or upcoming for other countries.[1] Further refinements can hardly be produced in the short run, while it seems reasonable to think that they would not change significantly the overall pattern. At present, these estimates allow us to set the Italian case within the international context and to draw the basic lines of a long-term picture.

Different theoretical models share the belief that over the long run regional inequality is somehow self-correcting, although for various reasons the pace of convergence can proceed more slowly than expected. The first motive of interest in studying the Italian case arises from the fact that the north-south divide is persisting over the long run. And yet this assertion must be supported by quantitative evidence, qualified by data. As we are going to see, the problem of the south (*questione meridionale*) was debated in Italy since the end of the nineteenth cen-

[1] A research team coordinated by Joan R. Rosés and Nikolaus Wolf and funded by the European Science Foundation – ESF is at work in order to produce regional Gdp estimates for the European regions at Nuts II, in benchmark years approximately from the end of the nineteenth century. Present estimates follow similar methods and assumptions, and rely upon a highly detailed sectoral breakdown.

tury, and over time different views have been held about the historical pattern of regional inequality in Italy – at least for the period spanning from Unification (1861) to the economic boom following Second World War, when regional figures are lacking or controversial. New historical value added estimates can therefore be precious in order to make a net addition to this century-long discussion.

During the second half of the twentieth century, at least two more arguments have emerged making the study of the Italian case more appealing – and demanding. The first one is the failure of state intervention: over forty years from the early 1950s to the early 1990s (but with precedents in the pre-First World War period and remnants up to our days), a massive regional policy was pursued in the South, which rendered the lack of convergence even more remarkable, and full of implications well beyond the field of economic history, e.g. for policy makers. Historical figures of regional value added give us the basic elements to properly evaluate Italy's regional policies over the long run, allowing us to analyse and compare economic conditions and the pattern of regional inequality before, during, and after state intervention.

The other motive of interest is related to social capital. From the re-known Banfield's argument about amoral familism in the 1950s,[2] down to Putnam[3] and Leonardi,[4] Italy has been identified as a country paradigmatic of regional differences in social capital and culture, in the sense of values and attitudes. These have been increasingly regarded as a major determinant of differences in economic outcome: as David Landes puts it, when concluding his breathtaking volume *The Wealth and Poverty of Nations*, 'If we learn anything from the history of economic development, it is that culture makes *all* the difference' (italics are mine); but he also adds, a few lines after, that culture 'frightens scholars. It has a sulphuric odor of race and inheritance, an air of immutability.'[5] Was it the case also for southern Italy, did social capital make the difference and was this true over the long-run? Was the *Mezzogiorno* doomed to be backward? Although to review the role of social capital is far from our scope, the article may be useful to lay the ground for further research in this direction. If some consensus has been reached over the negative effects of low social capital and of organized crime in the south

[2] Banfield, *The moral basis*.

[3] *Making democracy work*.

[4] E.g. *Convergence, cohesion and integration*

[5] Landes, *The Wealthy and Poverty*, p. 516.

during the last decades (all the more when compared to the outstanding economic performance of some central and north-eastern regions, which instead could rely upon unusually high levels of social capital and trust), from a historical perspective this statement is far more problematic, mainly because of possible endogeneity (the causation link) between low social capital and depressed economic conditions: to properly formulate the endogeneity problem should be regarded as a priority for further research, and historical estimates of economic conditions are indispensable for this purpose.

The article proceeds as follows. Section one introduces the estimates of value added per capita, whereas sections two-four presents the regional figures of productivity and labour force, as a total and by sectors, in order to provide the backbone for further analyses (sources and methods are discussed in the final appendix). The rest of the paper turns to the questions raised in the introduction, moving from post-Unification Italy until our days. Section five is devoted to critically review the debate about the origins and extent of the north-south divide, whereas section six makes profit of the new estimates in order to reinterpret the contributions of migration and of regional policy, which in the twentieth century can be regarded as the main determinants of convergence. Section seven extends implications to the literature about regional convergence and to the role of social capital.

## 1. New estimates and official figures: a long-term picture

Table 1 presents estimates of regional value added in Italy, in benchmark years from the end of the nineteenth century. Before we discuss the results, just a few notes on the choice of benchmarks (and thus on sources and methods) are warranted. The first four – 1891, 1911, 1938 ad 1951 – are the only ones, over the century after Unification, where new and reliable value added national estimates are available:[6] from these new regional estimates have been

[6] To understand the problems with the previous Istat-Fuà series, see Fenoaltea, 'The reconstruction'. For a synthesis of his alternative results (not definitive yet) and implications, see idem, *L'economia italiana*. New value added national estimates for benchmark years have been produced by Federico for agriculture, by Fenoaltea and Bardini for industry, by Zamagni and Battilani for services: Rey, ed., *I conti economici 2* and *I conti economici 3*. This is the main reason why previous regional estimates are no longer satisfactory and by now can be considered outdated.

produced, by Federico for agriculture[7] and by Felice for services and industry;[8] the latter have here been improved by incorporating, for 1891 and 1911, the 'second generation' estimates by Ciccarelli and Fenoaltea, which at the present cover about half of the industrial sectors[9] (for further details on sources and methods and a critical review of the results, see the appendix). From 1971 official figures are available,[10] on a yearly basis, but to report the entire series would have been uneconomical: the option was again for benchmark years, with a split in 1981 in order to point out that the south's convergence was reversed in the 1970s; from 1981 to 2001, there was no other significant discontinuity in the overall trend.[11]

Table 1. *Regional valued added per capita in Italy, 1891-2001 (Italy=1)*

| | 1891 | 1911 | 1938 | 1951 | 1971 | 1981 | 2001 |
|---|---|---|---|---|---|---|---|
| Piedmont | 1.08 | 1.15 | 1.39 | 1.47 | 1.21 | 1.17 | 1.15 |
| Aosta Valley | | | | 1.58 | 1.35 | 1.25 | 1.24 |
| Liguria | 1.44 | 1.54 | 1.68 | 1.62 | 1.16 | 1.09 | 1.09 |
| Lombardy | 1.15 | 1.19 | 1.39 | 1.53 | 1.34 | 1.30 | 1.30 |
| *North-west* | *1.16* | *1.22* | *1.43* | *1.52* | *1.28* | *1.23* | *1.24* |
| Trentino-Alto A. | - | - | 0.95 | 1.06 | 1.01 | 1.12 | 1.29 |
| Veneto | 0.80 | 0.86 | 0.84 | 0.98 | 0.99 | 1.08 | 1.13 |
| Friuli-V. Giulia | - | - | 1.19 | 1.11 | 1.00 | 1.09 | 1.12 |
| Emilia | 1.06 | 1.08 | 1.04 | 1.12 | 1.14 | 1.29 | 1.23 |
| Tuscany | 1.03 | 0.97 | 1.01 | 1.05 | 1.05 | 1.10 | 1.09 |
| The Marches | 0.88 | 0.81 | 0.79 | 0.86 | 0.91 | 1.05 | 0.99 |
| Umbria | 1.02 | 0.92 | 0.96 | 0.90 | 0.93 | 0.98 | 0.96 |
| Latium | 1.57 | 1.49 | 1.19 | 1.08 | 1.07 | 1.04 | 1.13 |
| *Center/north-east* | *1.01* | *1.00* | *0.99* | *1.04* | *1.04* | *1.11* | *1.13* |
| Abruzzi | 0.66 | 0.68 | 0.58 | 0.58 | 0.80 | 0.84 | 0.84 |
| Campania | 0.97 | 0.94 | 0.82 | 0.69 | 0.71 | 0.67 | 0.65 |
| Abulia | 1.02 | 0.85 | 0.72 | 0.65 | 0.75 | 0.72 | 0.67 |
| Lucania | 0.74 | 0.73 | 0.57 | 0.47 | 0.75 | 0.68 | 0.73 |
| Calabria | 0.67 | 0.70 | 0.49 | 0.47 | 0.67 | 0.64 | 0.64 |
| Sicily | 0.93 | 0.85 | 0.72 | 0.58 | 0.70 | 0.68 | 0.66 |
| Sardinia | 0.94 | 0.92 | 0.83 | 0.63 | 0.85 | 0.71 | 0.76 |

[7] 'L'agricoltura italiana' and 'Le nuove stime'.

[8] 'Il reddito delle regioni' and 'Il valore aggiunto'.

[9] Fenoaltea, 'Textile'. Ciccarelli and Fenoaltea, 'Mining', 'Chemicals', 'Utilities', 'Construction', 'Metalmaking', 'Shipbuilding', as well as some still unpublished (quarries, non-metallic mineral products, clothing and white goods, hat industry), of which I am deeply grateful to the authors.

[10] Svimez, *I conti del Mezzogiorno*; Istat, *Conti economici*; idem, 'Sistema di indicatori'.

[11] It must be added that all estimates do not allow for possible regional disparities in the cost of living: my prime impression is that the resulting overestimate of the north-south divide could be limited to the second half of the twentieth century. However, the production of a reliable regional price index for the years before the 1970s should be regarded as a major task for further research.

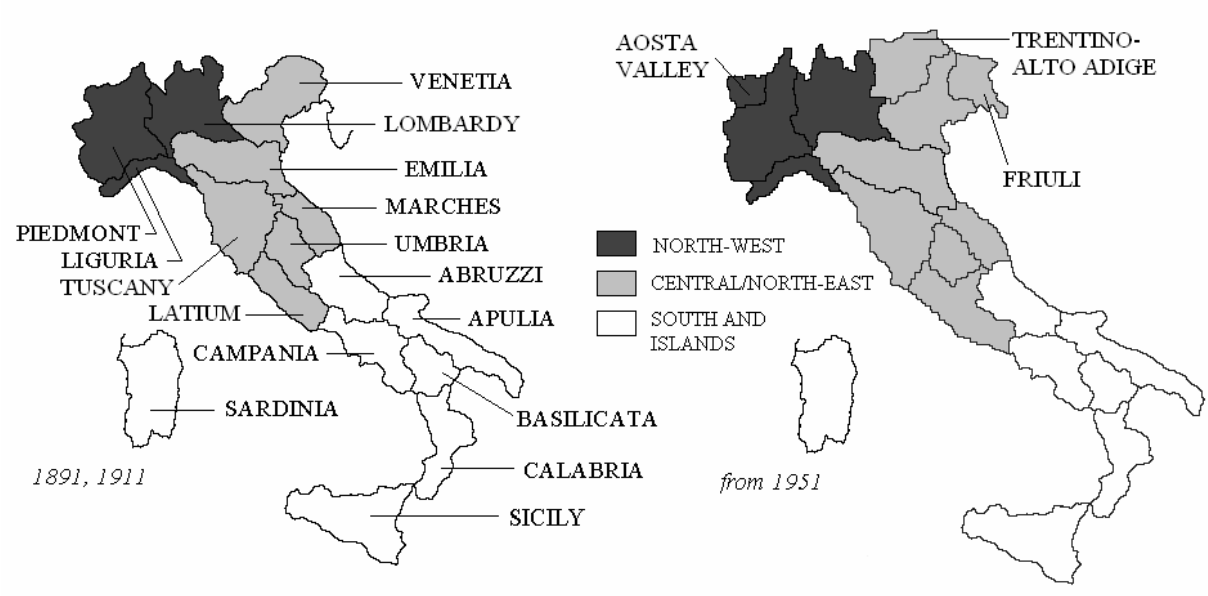
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *South and islands* | *0.88* | *0.84* | *0.70* | *0.61* | *0.73* | *0.70* | *0.68* |
| Italy (2001 euros) | 1,313 | 2,064 | 2,596 | 2,940 | 10,027 | 13,199 | 19,928 |
| *Yearly growth rate (%)* | - | *2.29* | *0.85* | *0.96* | *6.33* | *2.79* | *2.08* |

*Notes*: at the borders of the time and on current population.

*Sources*: see text.

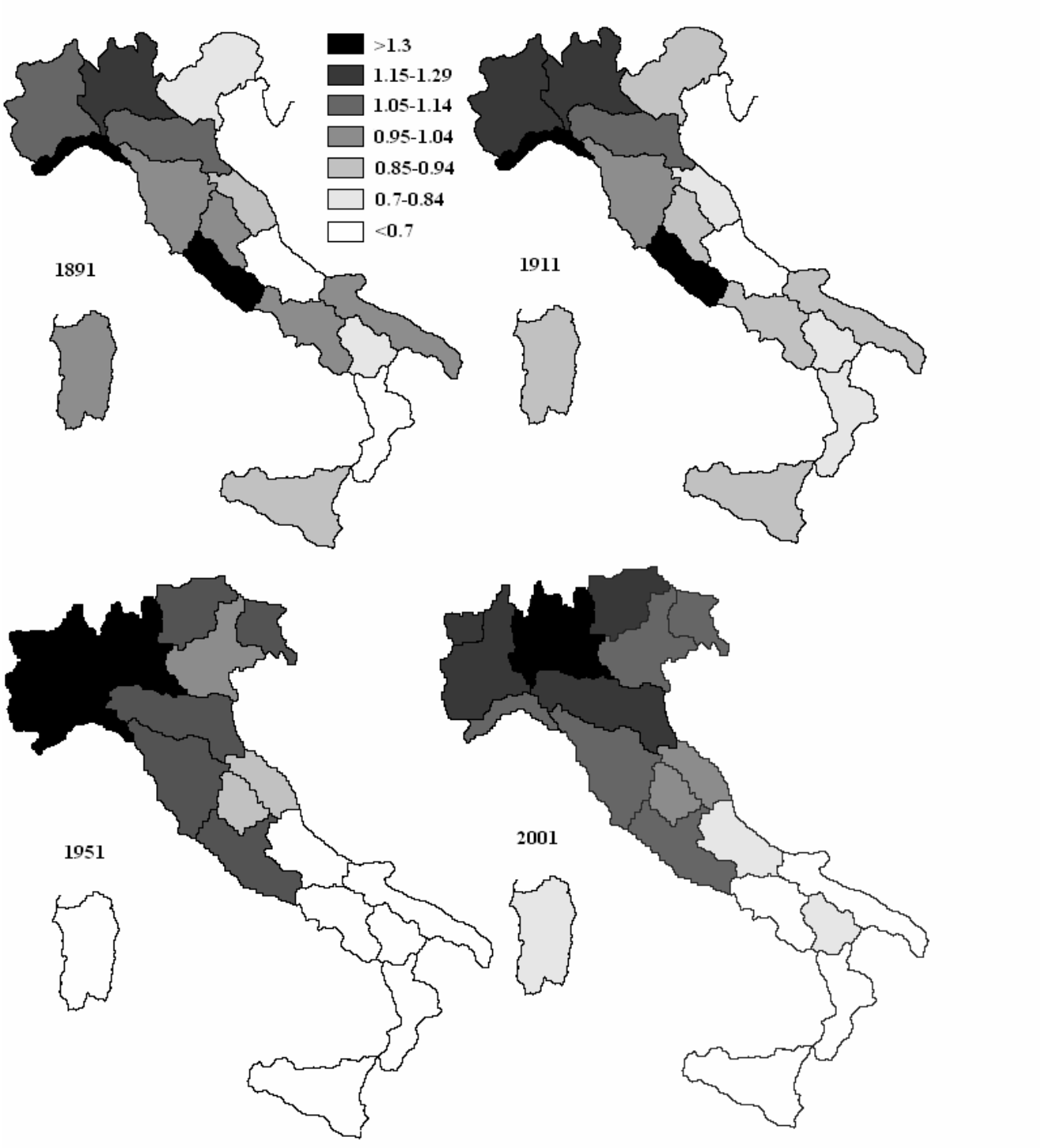
Before we enter the narrative, again, figure 1 aims to give to the reader the basic information about the Italian regions, as well as to illustrate the border changes which took place from First World War to Second World War: at the regional level, these affected Latium, Umbria, Abruzzi, Campania, Veneto, but also to a minor degree Lombardy, Piedmont, Emilia, Tuscany; and of course they involved the annexation after First World War – at a huge cost – of two new regions, Trentino-Alto Adige and Friuli (with Istria, lost after Second World War). Figure 1 also incorporates the usual economic and social (not administrative) classification into macro-areas: north-west (the traditional industrial triangle), center/north-east (hereafter Nec), and south and islands (the Italian *Mezzogiorno*). Figure 2 shows the regional rankings in per capita value added from 1891 to 2001, as from table 1, thus introducing the narrative.

Figure 1. *Italy's regions*




*Notes*: Molise, one more region very small, was created in 1963 from Abruzzi (its southernmost part); to have uniformity in the long run, here it was not reported. I am grateful to Stefano Fenoaltea for the '1891, 1911' map.

Figure 2. *The map of regional inequality in Italy, 1891-2001 (per capita value added, Italy=1)*




*Sources and notes*: see table 1.

The main findings can be summarized in a few sentences. The starting point was not one of great divergence, i.e. the north-south divide was not particularly pronounced in 1891 and even in 1911. In the first half of the twentieth century differences increased. The north-west pulled ahead first, and reached its peak by the mid of the twentieth century. The central and north-eastern regions caught-up successfully since 1938 until our days, by 2001 ending up short below the north-west. The Mezzogiorno fell back mostly during the interwar years, from 1911 to 1951; it started to converge during the economic boom (1951–71), but then fell back again, although slightly, since the 1970s.

The figures also suggest (something implicit in the above outline) that in order to analyse the pattern of regional inequality, Italy is better divided into three rather than two areas. Within both the Nec and the Mezzogiorno regional differences were considerable high in 1891 and 1911: one region of center/north-east, Latium, with the national capital, ranked first, together with Liguria in the north-west; in the south, at 1891 Campania, Apulia, Sicily, and Sardinia were around or short below the Italian average. The three-fold classification took shape only in the interwar years, when, in contrast to increasing divergence at the national level, a process of convergence *within* the three macro-areas took place: the interwar years marked the sharp decline of Latium in the center/north-east, of Campania, Apulia, and Sicily in the *Mezzogiorno*. Other significant internal movements took place in the second half of the twentieth century. In the north-west, Liguria declined in the years of the economic boom. In the *Mezzogiorno*, the less populated regions, Abruzzi, Basilicata, and Sardinia, continued slightly to converge also in the last decades of the twentieth century, unlike the rest of the south: as a result, some of the regions which in 1891 were the most backward, one century after ranked as the most rich (or the less backward) in the *Mezzogiorno*.

Previous regional estimates, such as the one by Zamagni for 1911,[12] by Esposto for 1891 and 1911,[13] by Tagliacarne for 1951,[14] a part from relying upon the now outdated Istat-Fuà national accounts, differed significantly for sources and methods, and thus it would be hard (and essentially incorrect) to extract from them a long-term pattern of regional inequality. If

[12] *Industrializzazione e squilibri*.

[13] 'Estimating'.

[14] 'Calcolo del reddito'.

any picture emerged, however, this was considerably different from the one sketched above: southern Italy was much more uniformly backward in the liberal age, and the north-south divide would have remained more or less unchanged until the 1950s.[15] Thus present data change significantly our knowledge about the pattern of regional inequality in Italy, and the rest of the article is devoted to detail the estimates and to discuss their implications.

To begin, we can ask if there was convergence in the long run. A first answer is offered in table 2, which reports estimates of regional inequality following the index proposed by Jeffrey Williamson.[16] This index has a rationale similar to the variance or the standard deviation, and thus it can be taken as a measure of sigma convergence (the decrease of dispersion), but should be regarded as more appropriate for analysis of regional convergence in value added per capita, since it weights deviations with the share of population (small regions have a minor impact),[17] according to the formula:

$$D = \sqrt{\sum_{i=1}^{n} \left( \frac{y_i}{y_m} - 1 \right)^2 \cdot \frac{p_i}{p_m}} \qquad (1)$$

where $y$ is income per capita, $p$ is population, and $i$ and $m$ refer to the $i$-region and to the national (or macro-regional) total respectively. Results confirm the narrative presented above: convergence took place *within* the three macro-areas, but not within Italy as a whole, that is not *between* the south and the rest of the country. Limitedly to the national index, it should be added that the slight convergence of the last three decades is the result of two distinct processes: on the one side divergence of the southern regions, on the other convergence of the Nec regions towards the north-west.

[15] For a comprehensive comparison, see Felice, 'Il reddito delle regioni' and 'Il valore aggiunto'.

[16] 'Regional inequality'.

[17] The index is insensitive to changes in the number of regions, thanks to population weights and because the new regions do not score values significantly different from the average. Two of the three new regions, Trentino-Alto Adige and Friuli, when included are not outliers, whereas Aosta Valley is, but its weight is marginal. Without Trentino and Friuli, the national index amounts to 0.306 in 1938, the center/north-east's one to 0.133; without Aosta Valley, the national index is 0.361 in 1951, the north-west's one again 0.031.

Table 2. *Index of regional inequality, 1891-2001*

| | 1891 | 1911 | 1938 | 1951 | 1971 | 1981 | 2001 |
|---|---|---|---|---|---|---|---|
| Italy | 0.194 | 0.208 | 0.302 | 0.362 | 0.226 | 0.240 | 0.250 |
| North-west | 0.094 | 0.101 | 0.070 | 0.031 | 0.057 | 0.064 | 0.067 |
| Center/north-east | 0.214 | 0.193 | 0.136 | 0.074 | 0.063 | 0.082 | 0.067 |
| South and islands | 0.149 | 0.108 | 0.156 | 0.118 | 0.066 | 0.069 | 0.082 |

*Sources*: see text.

Although regional rankings changed, over the long-run we may conclude that there was not sigma convergence, i.e. there was not a decrease of dispersion. This evidence does not invalidate the possibility of beta convergence, i.e. that the most backward regions grew faster than the most advanced ones: beta convergence is a necessary condition of sigma convergence, not viceversa. In table 3 beta convergence has been tested via two different models: the first one (random effects), assumes that possible unknown determinants of convergence randomly distribute across regions and periods, whereas the second model (fixed effects) tests convergence under the hypothesis that unknown explanatory variables vary across regions but do not change over time within each region (and thus their fixed effects can be eliminated in a sequence of observations). The first model can be taken as a measure of unconditional convergence, the second one as a measure of conditional convergence (although the possible conditioning variables remain unknown). Results exclude divergence, but they do not even support unconditional convergence: in the random model, the negative coefficient of the explanatory variable is negative, but insignificant with the robust option, i.e. once heteroskedasticity is controlled for. If we pass to the fixed-effect model the coefficient becomes significant, even after allowing for heteroskedasticity: something, a persistent negative conditioning variable (such as geographical position, culture, social capital, or even a mix of these factors), could have prevented the poorest regions to converge. In both cases, the evidence that the average growth rate is not correlated with its lag (columns 3 and 5) comforts us about the statistical validity of the model.[18] For what regards the random-effects model, it is worth reminding that the inconclusiveness is due to the different paths between the Nec's regions and some of the poorest southern regions (which converged), and the rest of the south (which did not).

[18] In panel models, autocorrelation between growth rates tends to bias the correlation between growth rates and value added.

Table 3. *Convergence in value added per capita (panel data)*

| | Random-effects GLS regression | | | |
|---|---|---|---|---|
| | Normal | | Robust | |
| Lag VA per cap | -.0054 | -.0037 | -.0054 | -.0037 |
| Standard Error | .0028* | .0032 | .0033 | .0035 |
| Lag av_growth | | -.0939 | | -.0939 |
| Standard Error | | .1076 | | .1075 |
| Constant | .0048 | .0031 | .0048 | .0031 |
| Standard Error | .0029 | .0032 | .0036 | .0038 |
| R-squared | 0.026 | 0.031 | 0.026 | 0.031 |
| Number of obs. | 107 | 88 | 107 | 88 |
| | Fixed-effects (within) regression | | | |
| | Normal | | Robust | |
| Lag VA per cap | -.0226 | -.0245 | -.0226 | -.0245 |
| Standard Error | .0056*** | .0085*** | .0056*** | .0073*** |
| Lag av_growth | | -.1614 | | -.1614 |
| Standard Error | | .1283 | | .1343 |
| Constant | .0215 | .0231 | .0215 | .0231 |
| Standard Error | .0055*** | .0082*** | .0055*** | .0070*** |
| R-squared | 0.026 | 0.027 | 0.026 | 0.027 |
| Number of obs. | 107 | 88 | 107 | 88 |

Dependent variable: average growth rate of value added per capita. Both the dependent variable and the explanatory variable (value added per capita) are expressed relatively to the Italian average – i.e to the mean weighted with the size (population) of each observation (region).

* = Significant at the 10% level *** = Significant at the 1% level.

## 2. Labour force

Value added per capita can be decomposed in two components: value added per worker and activity rate (the labour force as a share of total population). As from the equation:

$$Y/P = Y/L*L/P, \quad (2)$$

where Y is value added, P is population, and L is labour. On this approach I follow Vittorio Daniele and Paolo Malanima,[19] who have already estimated the contribution of value added per worker and activity rates to the North-South divide, i.e. limitedly to the Center-North and the *Mezzogiorno*, on a yearly basis from 1861 to 2004.

Regional differences in activity rates are shown in table 4. First of all a comment on absolute (Italian) figures, last row, which decreased through almost all the period, with the exception of the 1970: because of demographical and social reasons – urbanization, demographic transition, the spread of mass education and of social security systems – which more than offset changes in the opposite direction – mainly the rise of female employment. At 1891 southern Italy scored the lowest activity rate and this gap was bound to increase through most of the twentieth century, with the exception of the 1938–51 years and the 1970s. At a first glance, this decline looks as one of the main culprits for the south's lack of convergence; yet the Mezzogiorno lost positions also in its years of convergence, the 1950s and 1960s.

Table 4. *Activity rates, 1891-2001 (Italy=1)*

| | 1891 | 1911 | 1938 | 1951 | 1971 | 1981 | 2001 |
|---|---|---|---|---|---|---|---|
| Piedmont | 1.12 | 1.17 | 1.22 | 1.19 | 1.13 | 1.11 | 1.13 |
| Aosta Valley | | | | 1.42 | 1.28 | 1.30 | 1.22 |
| Liguria | 0.99 | 1.03 | 1.04 | 0.98 | 0.99 | 1.00 | 0.99 |
| Lombardy | 1.10 | 1.06 | 1.10 | 1.12 | 1.14 | 1.11 | 1.18 |
| *North-west* | *1.09* | *1.10* | *1.13* | *1.12* | *1.12* | *1.10* | *1.15* |
| Trentino-Alto A. | - | - | 1.09 | 1.06 | 1.11 | 1.24 | 1.20 |
| Veneto | 0.99 | 1.00 | 1.00 | 1.02 | 1.02 | 1.10 | 1.17 |
| Friuli-V. Giulia | - | - | 1.06 | 1.05 | 1.04 | 1.08 | 1.14 |
| Emilia | 0.99 | 1.03 | 1.09 | 1.03 | 1.09 | 1.18 | 1.19 |
| Tuscany | 0.82 | 1.01 | 1.03 | 1.05 | 1.03 | 1.10 | 1.09 |
| The Marches | 1.08 | 1.05 | 1.10 | 1.08 | 1.07 | 1.17 | 1.12 |
| Umbria | 1.60 | 1.01 | 1.05 | 1.02 | 0.98 | 1.03 | 1.03 |
| Latium | 1.05 | 0.96 | 0.98 | 0.99 | 0.95 | 0.94 | 0.99 |
| *Center/north-east* | *0.99* | *1.01* | *1.04* | *1.03* | *1.02* | *1.08* | *1.11* |
| Abruzzi | 1.06 | 1.02 | 0.99 | 0.98 | 0.99 | 0.96 | 0.97 |
| Campania | 0.97 | 0.98 | 0.87 | 0.84 | 0.80 | 0.83 | 0.71 |
| Apulia | 0.92 | 0.91 | 0.85 | 0.92 | 0.94 | 0.84 | 0.81 |
| Lucania | 1.08 | 1.06 | 1.00 | 1.12 | 0.98 | 0.89 | 0.89 |
| Calabria | 1.01 | 1.05 | 0.91 | 1.01 | 0.92 | 0.83 | 0.75 |

[19] 'Il prodotto delle regioni'.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sicily | 0.84 | 0.81 | 0.79 | 0.79 | 0.82 | 0.78 | 0.72 |
| Sardinia | 0.82 | 0.82 | 0.85 | 0.89 | 0.88 | 0.83 | 0.88 |
| *South and islands* | *0.94* | *0.92* | *0.87* | *0.89* | *0.87* | *0.83* | *0.77* |
| Italy (%) | 50.4 | 47.3 | 43.4 | 42.1 | 37.1 | 39.2 | 36.8 |

*Sources*: for 1891, 1911, 1938, and 1951 workforce is from Vitali, *Aspetti dello sviluppo*; data for 1891 are obtained through interpolation between 1881 and 1901, but 1881 textile employment was re-estimated from Ellena, 'La statistica di alcune industrie', following Zamagni, 'A century of change', p. 38. The procedure is not inconsistent with Fenoaltea's new estimates of textile value added (Fenoaltea, 'Textile'), as long as this reduces the share of the southern regions (see appendix for further details).

To be fully understood and explained, data from table 4 must be jointly read with those from table 5, which displays the distribution of labour force by sectors – agriculture, industry, and services.[20] The population censuses included underemployment which, with some remarkable exceptions,[21] was more frequent in agriculture than in the rest of the economy. This can explain why in southern Italy the activity rate sharply declined from 1951 to 1971, when the share of agricultural employment dramatically fell. On the other hand, the finding that in the Mezzogiorno the activity rate was always lower than the Italian average even when the share of agricultural employment was relatively higher (particularly in 1951) should not come as a surprise, given the shortness in the South's labour demand well documented throughout this period by qualitative literature: it was mitigated by the great emigration of the liberal age

[20] Some caveats are warranted: particularly in the early population censuses, often rural women were counted in the labour force, as 'farm-wives', whereas in industry and services urban women were not, as 'house-wives': thus the size of the primary sector tended to affect positively, but artificially, the activity rate, while reducing value added per worker. However, the sector where most of the southern rural women were counted was textiles – where in our case alternative sources are used to estimate labour force – and this distortion became much less important from the 1901 population census onwards. According to the population censuses, in fact, in Italy the share of female agricultural employment, out of the total agricultural employment, passed from 36% in 1881 to 33% in 1901 and 1911, to 27% in 1936, and 25% in 1951; in the *Mezzogiorno*, it declined from 32% in 1881 to 29/30% in 1901 and 1911, down to 25/26 in 1938 and 1951. In industry and services, in Italy the share of female employment was 40% in 1881, 32% in 1901, and 30% in 1938; whereas in the *Mezzogiorno* it topped 47% in 1881, but had fallen to 30% in 1901, and down to 23% in 1938; the impressive 1881 share was due to the miscounting of southern rural women in the textile sector, yet the distortion had disappeared by 1901, without a resulting rise of agricultural female employment (which instead slightly decreased). Elaborations from Vitali, *Aspetti dello sviluppo*; see also Zamagni, 'A century of change'.

[21] The early population censuses, see the previous footnote.

(of which it was one major economic cause), while increasing in the interwar period, when emigration came to a halt for political reasons.

It is worth noticing that still in 1951 southern regions scored, as a whole, the same percentage of workers in agriculture as in 1891 or 1911, and indeed in Apulia and Sicily this share had increased: even when considered alone, this datum could account for the falling back of *Mezzogiorno* during the first half of the twentieth century.

Table 5. *Regional labour force by sectors, 1891-2001 (%)*

| | Agriculture | | | | | | Industry | | | | | | Services | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1891 | 1911 | 1938 | 1951 | 1971 | 2001 | 1891 | 1911 | 1938 | 1951 | 1971 | 2001 | 1891 | 1911 | 1938 | 1951 | 1971 | 2001 |
| Piedmont | 62.7 | 55.4 | 42.5 | 34.8 | 13.8 | 3.7 | 21.5 | 27.4 | 34.6 | 39.1 | 50.4 | 38.2 | 15.8 | 17.3 | 22.8 | 26.1 | 35.8 | 58.1 |
| Aosta Valley | | | | 55.0 | 22.6 | 5.7 | | | | 27.2 | 34.5 | 22.9 | | | | 17.9 | 42.9 | 71.4 |
| Liguria | 45.6 | 35.1 | 25.3 | 25.8 | 10.8 | 3.5 | 25.2 | 32.3 | 35.5 | 29.9 | 32.4 | 23.1 | 29.1 | 32.6 | 39.2 | 44.3 | 56.8 | 73.4 |
| Lombardy | 52.6 | 43.3 | 28.5 | 23.2 | 6.4 | 1.9 | 30.1 | 37.6 | 45.5 | 46.3 | 54.7 | 39.9 | 17.3 | 19.1 | 26.0 | 30.5 | 39.0 | 58.2 |
| *North-west* | *55.9* | *47.0* | *33.0* | *27.6* | *9.2* | *2.6* | *26.1* | *33.0* | *40.4* | *41.9* | *50.8* | *37.8* | *18.0* | *20.0* | *26.6* | *30.6* | *40.0* | *59.7* |
| Trentino-Alt. A. | n.a. | (66.5) | 50.2 | 49.3 | 19.7 | 8.3 | n.a. | (15.5) | 22.2 | 21.6 | 29.1 | 26.7 | n.a. | (18.0) | 27.7 | 29.1 | 51.2 | 65.0 |
| Veneto | 62.5 | 61.1 | 53.0 | 48.6 | 17.1 | 4.2 | 20.4 | 21.5 | 25.7 | 25.5 | 42.6 | 40.7 | 17.1 | 17.5 | 21.3 | 25.9 | 40.4 | 55.1 |
| Friuli-V. Giulia | n.a. | (51.9) | 37.9 | 39.0 | 14.5 | 3.2 | n.a. | (25.2) | 28.1 | 28.7 | 37.7 | 32.5 | n.a. | (22.9) | 34.0 | 32.3 | 47.9 | 64.3 |
| Emilia | 61.8 | 58.3 | 58.6 | 47.7 | 18.7 | 5.6 | 20.3 | 24.2 | 21.0 | 24.1 | 39.0 | 35.9 | 17.9 | 17.5 | 20.5 | 28.1 | 42.3 | 58.4 |
| Tuscany | 56.6 | 50.9 | 47.5 | 41.0 | 13.0 | 3.9 | 24.6 | 30.8 | 28.6 | 30.8 | 43.0 | 34.1 | 18.8 | 18.4 | 24.0 | 28.3 | 44.0 | 62.1 |
| The Marches | 68.8 | 67.4 | 66.5 | 55.9 | 26.8 | 4.0 | 17.6 | 19.2 | 18.1 | 21.9 | 35.2 | 40.8 | 13.6 | 13.4 | 15.4 | 22.2 | 38.1 | 55.2 |
| Umbria | 73.0 | 69.5 | 64.5 | 55.6 | 23.4 | 4.7 | 14.4 | 17.5 | 19.6 | 21.6 | 36.1 | 32.8 | 12.6 | 13.0 | 15.8 | 22.8 | 40.5 | 62.5 |
| Latium | 52.6 | 44.9 | 41.6 | 32.8 | 10.0 | 3.6 | 19.1 | 23.0 | 22.4 | 20.5 | 26.3 | 19.7 | 28.3 | 32.1 | 36.1 | 46.6 | 63.7 | 76.7 |
| *Center/north-east.* | *61.3* | *57.5* | *52.0* | *44.5* | *16.0* | *4.5* | *20.5* | *23.9* | *23.8* | *24.9* | *36.8* | *32.8* | *18.2* | *18.6* | *24.2* | *30.7* | *47.2* | *62.7* |
| Abruzzi | 76.0 | 77.2 | 74.3 | 69.3 | 36.4 | 6.8 | 14.6 | 13.0 | 12.5 | 13.1 | 26.0 | 32.6 | 9.5 | 9.9 | 13.2 | 17.7 | 37.6 | 60.6 |
| Campania | 54.3 | 53.4 | 48.0 | 46.6 | 25.7 | 6.9 | 23.0 | 23.3 | 24.1 | 20.9 | 29.6 | 24.4 | 22.8 | 23.3 | 27.9 | 32.5 | 44.7 | 68.8 |
| Apulia | 63.9 | 63.0 | 52.9 | 64.7 | 39.9 | 11.7 | 19.3 | 20.1 | 25.7 | 13.4 | 24.1 | 26.1 | 16.8 | 16.9 | 21.4 | 21.9 | 36.0 | 62.2 |
| Lucania | 76.6 | 76.7 | 75.2 | 75.2 | 43.7 | 10.8 | 12.8 | 12.8 | 12.9 | 11.0 | 23.8 | 34.6 | 10.6 | 10.5 | 11.9 | 13.8 | 32.5 | 54.7 |
| Calabria | 64.4 | 67.3 | 67.6 | 66.4 | 38.8 | 12.0 | 22.0 | 20.6 | 15.9 | 15.3 | 25.6 | 19.4 | 13.5 | 12.1 | 16.5 | 18.3 | 35.7 | 68.5 |
| Sicily | 53.9 | 52.7 | 51.0 | 56.4 | 30.3 | 9.6 | 23.5 | 22.8 | 21.8 | 16.9 | 26.1 | 19.9 | 22.6 | 24.5 | 27.2 | 26.7 | 43.7 | 70.5 |
| Sardinia | 61.3 | 59.0 | 56.4 | 56.5 | 27.0 | 8.5 | 18.7 | 20.9 | 20.0 | 17.5 | 26.9 | 23.0 | 20.0 | 20.1 | 23.6 | 26.0 | 46.1 | 68.5 |
| *South and islands* | *61.0* | *60.5* | *56.7* | *59.2* | *32.8* | *9.2* | *20.7* | *20.6* | *20.7* | *16.3* | *26.5* | *24.3* | *18.4* | *19.0* | *22.6* | *24.5* | *40.8* | *66.5* |
| Italy | 59.6 | 55.4 | 48.0 | 44.6 | 18.9 | 5.2 | 22.3 | 25.5 | 27.6 | 26.8 | 38.1 | 32.0 | 18.2 | 19.1 | 24.4 | 28.6 | 43.1 | 62.8 |

*Sources*: Felice, *Divari regionali*, p. 137; for 1891 and 1938 see table 4.

In Italy as a whole industrialization was a long-term process, which unfolded through 'waves' from the nineteenth century until the 1970s. Moreover, it took place at different times across the Italian regions, and thus it gets of crucial importance in order to understand regional differences in both value added per worker and activity rate. In the north-west, the share of workers in industry rose until the 1970s: the industrial triangle emerged in the Giolitti's age, but it was in the interwar years that divide with the rest of the country increased dramatically, in line with value added per capita. Conversely, in the south the share of industrial workers remained below the national average throughout the twentieth century, also in the decades of convergence: industrialization made some progress, but stopped well before than elsewhere; the premature halt left higher shares of workers in agriculture and services, as well as (at least according to the official figures) lower activity rates. At the same time, the rise of the central/north-east was mainly referable to industry: indeed the percentage of indus-

trial workers decreased here too in the last decades, yet much less than in the rest of the country.

### 3. Value added per worker

The estimates of value added per worker are shown in the following tables, as a total (table 6) and separately for agriculture, industry, and services (table 7); these latter should be taken with more caveats, as no more than orienting figures.

At 1891, value added per worker was in the *Mezzogiorno* just a few points below the centre-north. But the divide widened until 1951: quite slowly at first, during the Giolitti's age, then at a more speedy pace. Conversely, it decreased during the years of convergence, 1951-71, but also at a very slow rate in the last two decades (1981-2001). For what concerns the rest of the country, the north-west forged ahead until 1951, then it lost some points but maintained its lead. Nec regions have always been hovering around the Italian average, with two limited advances, in the years around Second World War and in the 1970s: not by chance, these were also the periods of more intense catching-up in value added per capita. Within the three macro-areas, convergence in per worker productivity took place throughout the period: as with value added, also in this case the threefold classification must be regarded as an ex-post construction.

Table 6. *Value added per worker, 1891-2001 (Italy=1)*

| | 1891 | 1911 | 1938 | 1951 | 1971 | 1981 | 2001 |
|---|---|---|---|---|---|---|---|
| Piedmont | 0.96 | 0.99 | 1.14 | 1.23 | 1.06 | 1.05 | 1.02 |
| Aosta Valley | | | | 1.12 | 1.05 | 0.97 | 1.02 |
| Liguria | 1.45 | 1.50 | 1.61 | 1.66 | 1.17 | 1.09 | 1.11 |
| Lombardy | 1.05 | 1.13 | 1.26 | 1.37 | 1.17 | 1.16 | 1.10 |
| *North-west* | *1.06* | *1.11* | *1.26* | *1.35* | *1.14* | *1.12* | *1.08* |
| Trentino-Alto A. | - | - | 0.87 | 1.00 | 0.90 | 0.90 | 1.08 |
| Veneto | 0.81 | 0.87 | 0.84 | 0.96 | 0.97 | 0.99 | 0.96 |
| Friuli-V. Giulia | - | - | 1.12 | 1.06 | 0.96 | 1.00 | 0.98 |
| Emilia | 1.08 | 1.05 | 0.96 | 1.08 | 1.05 | 1.10 | 1.03 |
| Tuscany | 1.25 | 0.96 | 0.98 | 1.01 | 1.02 | 1.01 | 1.00 |
| The Marches | 0.81 | 0.78 | 0.72 | 0.80 | 0.85 | 0.90 | 0.88 |
| Umbria | 0.64 | 0.91 | 0.92 | 0.88 | 0.94 | 0.95 | 0.94 |
| Latium | 1.50 | 1.55 | 1.21 | 1.09 | 1.13 | 1.10 | 1.14 |
| *Center/north-east* | *1.02* | *0.99* | *0.96* | *1.01* | *1.01* | *1.03* | *1.02* |
| Abruzzi | 0.62 | 0.66 | 0.58 | 0.59 | 0.82 | 0.87 | 0.87 |
| Campania | 0.99 | 0.97 | 0.94 | 0.83 | 0.88 | 0.81 | 0.92 |
| Apulia | 1.12 | 0.94 | 0.85 | 0.71 | 0.80 | 0.85 | 0.83 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Lucania | 0.68 | 0.69 | 0.57 | 0.42 | 0.77 | 0.77 | 0.82 |
| Calabria | 0.66 | 0.67 | 0.54 | 0.47 | 0.72 | 0.77 | 0.85 |
| Sicily | 1.10 | 1.05 | 0.92 | 0.74 | 0.85 | 0.88 | 0.92 |
| Sardinia | 1.15 | 1.12 | 0.98 | 0.71 | 0.96 | 0.85 | 0.86 |
| *South and islands* | *0.94* | *0.91* | *0.81* | *0.69* | *0.84* | *0.84* | *0.88* |
| Italy (2001 euros) | 2,607 | 4,358 | 5,984 | 6,986 | 27,043 | 33,704 | 54,211 |
| *Yearly growth rate (%)* | - | *2.60* | *1.92* | *1.20* | *7.00* | *2.23* | *2.40* |

*Sources*: see text and table 4.

Table 7. *Value added per worker in agriculture, industry, and services, 1891-2001 (Italy=1)*

| | Agriculture | | | | | | Industry | | | | | | Services | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1891 | 1911 | 1938 | 1951 | 1971 | 2001 | 1891 | 1911 | 1938 | 1951 | 1971 | 2001 | 1891 | 1911 | 1938 | 1951 | 1971 | 2001 |
| Piedmont | 0.80 | 0.86 | 0.99 | 1.34 | 0.85 | 1.14 | 1.36 | 1.09 | 1.28 | 1.16 | 1.07 | 1.03 | 0.98 | 1.08 | 1.03 | 1.03 | 1.05 | 1.03 |
| Aosta Valley | | | | 0.98 | 0.42 | 0.48 | | | | 1.76 | 1.51 | 0.95 | | | | 0.98 | 0.91 | 1.03 |
| Liguria | 0.71 | 1.05 | 0.98 | 1.11 | 1.21 | 1.16 | 2.02 | 1.50 | 1.46 | 1.56 | 1.14 | 1.13 | 1.22 | 1.23 | 1.34 | 1.46 | 1.05 | 1.06 |
| Lombardy | 0.74 | 0.91 | 1.23 | 1.36 | 1.48 | 1.81 | 1.14 | 1.09 | 1.13 | 1.18 | 1.10 | 1.09 | 1.27 | 1.21 | 1.09 | 1.11 | 1.08 | 1.09 |
| *North-west* | *0.76* | *0.90* | *1.10* | *1.31* | *1.14* | *1.43* | *1.31* | *1.13* | *1.21* | *1.21* | *1.10* | *1.08* | *1.16* | *1.17* | *1.12* | *1.15* | *1.07* | *1.07* |
| Trentino-Alt. A. | - | - | 0.68 | 0.94 | 0.73 | 0.85 | - | - | 1.04 | 1.11 | 1.14 | 1.16 | - | - | 0.88 | 1.05 | 0.80 | 1.08 |
| Veneto | 0.71 | 0.88 | 0.89 | 0.97 | 1.21 | 1.24 | 1.03 | 1.04 | 0.83 | 1.02 | 0.88 | 0.93 | 0.89 | 0.87 | 0.90 | 0.99 | 1.01 | 1.00 |
| Friuli-V. Giulia | - | - | 0.64 | 0.68 | 0.76 | 1.42 | - | - | 1.15 | 1.03 | 0.99 | 0.95 | - | - | 1.08 | 1.18 | 0.90 | 0.98 |
| Emilia | 1.18 | 1.24 | 1.19 | 1.39 | 1.49 | 1.24 | 1.08 | 1.04 | 1.00 | 0.99 | 1.00 | 1.11 | 0.91 | 0.91 | 0.92 | 1.02 | 1.02 | 1.01 |
| Tuscany | 1.03 | 0.93 | 0.97 | 1.01 | 1.03 | 0.88 | 1.24 | 0.94 | 1.00 | 0.93 | 0.96 | 0.98 | 1.01 | 0.99 | 0.99 | 1.00 | 1.00 | 1.00 |
| The Marches | 0.93 | 0.91 | 0.91 | 1.19 | 0.71 | 1.19 | 0.73 | 0.80 | 0.65 | 0.61 | 0.81 | 0.78 | 0.83 | 0.78 | 0.87 | 0.80 | 1.01 | 0.96 |
| Umbria | 1.26 | 1.07 | 1.14 | 1.13 | 0.81 | 1.11 | 0.56 | 1.17 | 1.15 | 0.97 | 1.06 | 0.93 | 0.89 | 0.84 | 0.88 | 0.79 | 0.95 | 0.93 |
| Latium | 1.27 | 1.50 | 0.93 | 1.02 | 1.33 | 0.86 | 1.33 | 1.36 | 1.06 | 0.91 | 0.97 | 1.18 | 1.47 | 1.24 | 1.19 | 1.02 | 1.03 | 1.09 |
| *Center/north-east* | *1.00* | *1.04* | *0.97* | *1.08* | *1.13* | *1.09* | *1.05* | *1.03* | *0.96* | *0.95* | *0.95* | *1.01* | *1.01* | *0.97* | *1.00* | *1.01* | *1.00* | *1.02* |
| Abruzzi | 0.78 | 0.75 | 0.74 | 0.74 | 0.78 | 0.97 | 0.40 | 0.75 | 0.62 | 0.65 | 0.97 | 0.88 | 0.84 | 0.93 | 0.78 | 0.76 | 0.94 | 0.87 |
| Campania | 0.88 | 0.83 | 0.86 | 0.83 | 0.94 | 0.84 | 0.93 | 0.90 | 0.86 | 0.74 | 0.90 | 0.90 | 1.03 | 1.00 | 0.98 | 0.91 | 0.92 | 0.92 |
| Apulia | 1.62 | 1.10 | 1.19 | 0.82 | 0.81 | 0.72 | 0.47 | 0.72 | 0.47 | 0.72 | 0.93 | 0.77 | 0.88 | 0.96 | 0.95 | 0.94 | 0.96 | 0.88 |
| Lucania | 0.83 | 0.79 | 0.81 | 0.59 | 0.66 | 0.80 | 0.68 | 0.89 | 0.49 | 0.33 | 0.99 | 0.76 | 0.80 | 0.86 | 0.74 | 0.63 | 1.01 | 0.91 |
| Calabria | 0.91 | 0.83 | 0.64 | 0.62 | 0.67 | 0.83 | 0.38 | 0.50 | 0.54 | 0.37 | 0.68 | 0.82 | 0.64 | 0.78 | 0.69 | 0.61 | 0.98 | 0.87 |
| Sicily | 1.66 | 1.40 | 1.29 | 0.95 | 1.00 | 0.76 | 0.62 | 0.79 | 0.63 | 0.55 | 0.80 | 0.90 | 0.75 | 0.77 | 0.83 | 0.85 | 0.94 | 0.94 |
| Sardinia | 1.59 | 1.62 | 1.29 | 0.86 | 1.14 | 0.89 | 0.85 | 0.93 | 0.99 | 0.81 | 1.18 | 0.86 | 0.78 | 0.71 | 0.82 | 0.69 | 0.89 | 0.87 |
| *South and islands* | *1.18* | *1.03* | *0.98* | *0.80* | *0.87* | *0.80* | *0.65* | *0.79* | *0.67* | *0.64* | *0.89* | *0.85* | *0.86* | *0.88* | *0.88* | *0.83* | *0.94* | *0.90* |
| Italy | | | | | | 28,33 | | | | | 39,68 | 46,63 | | | | | 35,06 | 60,20 |
| (2001 euros) | 1,900 | 2,677 | 3,479 | 3,972 | 6,852 | 4 | 2,628 | 3,718 | 6,725 | 9,359 | 0 | 4 | 4,884 | 7,661 | 9,236 | 9,443 | 4 | 1 |

*Sources*: Felice, *Divari regionali*, p. 132; for 1891 and 1938 see table 4 and the text.

In agriculture, during the liberal age southern Italy could boast higher per worker production. This primacy is the ultimate reason of the south's relatively good ranking in value added per capita in 1891 and 1911. In terms of total factor productivity, however, in agriculture the centre-north and the *Mezzogiorno* were approximately at the same level;[22] that is, the former scored higher *per hectare* productivity than the south already by 1891.[23] In the first half of the twentieth century, the north-west scored an impressive rise in per worker productivity as well:[24] together with industrialization, this improvement was one of the reasons behind the north's rise in total per worker productivity in the same period.

[22] Federico, 'Ma l'agricoltura meridionale'.

[23] Felice, *Divari regionali*, p. 133.

[24] Since the previous per hectare primacy of the north-west was due not only to natural fertility but also to technology and agricultural infrastructure, we may suppose that a cumulative process of capital accumulation did

Unlike agriculture, at 1891 in industry north-south productivity difference was remarkable: manufacturing, still small, in part of the north-west was modern, in the rest of Italy traditional, in some regions of the south very backward. The north-south gap decreased in the following two decades, and it increased at a very slow rate from First World War to Second World War. But these were the very years when the north-western lead was progressively consolidated, also in terms of value added per worker. This means that, also by this regard, primacy must be attributed primarily to the rising share of labour force in industry and services, rather than to increasing productivity differences across industries. In the early stages, it was industrialization that mattered, following the established arguments by Simon Kuznets[25] and Edward Denison.[26] During the 1950s and 1960s, in industry regional productivity differences were partly overcome, and this is the most impressive movement from 1891 to 2001.

In services, until Second World War productivity differences were approximately in between those in agriculture and industry. By 1951, however, this had become the sector where regional disparities were less pronounced. The growth of public administration – as well as of other branches of services – played an important role in this result: here, in fact, both estimates in benchmark years and the official figures available from 1971 do not consider 'real' productivity, since they rely upon employees' wages; furthermore, in this sector, *ceteris paribus*, wages tended to be more equal across the Italian regions, than in the cases of industry and of market services (where instead, from the end of Second World War until the early 1970s, there were even official 'wage cages'). For this reason, the growing role of the public sector tended to reduce productivity disparities.

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take place: that is, higher per hectare productivity (partly due to capital accumulation) favoured higher returns to land investments and expenditures (in machinery, vehicles, and fertilizers) and thus capital accumulation and technological progress – and a further advancement in per hectare productivity, which resulted in per worker improvement as well (the increasing returns may be explained by the presence, here as elsewhere, of different 'waves' of capital investments over the long run, following technological change, which caused an upward shift of the production function, or even modified the shape of the function). However, at present this is only an interpretative hypothesis, which needs to be verified: it is worth noticing that higher capital accumulation often was accompanied with a stronger predisposition to investments and technological upgrading (cfr. Felice, *La Società*, particularly pp. 13–20), but the direction of causation has to be investigated.

[25] *Modern Economic Growth.*

[26] *Why growth rates differ.*

## 4. Comparing productivity and activity rates

The contribution of productivity and activity rates to the regional trends of value added per capita, in benchmark years, can be calculated from equation [2] via log transformation.[27] Results are shown in table 8, limitedly to value added per worker (productivity) and to the three macro-areas.

Table 8. *Percentage of value added per capita increase/decrease (on Italian average) due to productivity*

| | 1891-911 | 1911-38 | 1938-51 | 1951-71 | 1971-81 | 1981-2001 |
|---|---|---|---|---|---|---|
| North-west | 89.1 | 78.6 | All | *All* | *45.9* | None |
| Center/north-east | *All* | *All* | All | None | 20.6 | None |
| South and islands | *65.3* | *64.6* | *All* | All | *None* | *None* |

*Legend*: decrease in *italics*.

*Sources*: elaboration from tables 1, 4, 6.

During the liberal age and most of the interwar years, the south's divergence was due for two-thirds to value added per worker, for only one third to enlarging differences in activity rates. The south's convergence of the 1950s and 1960s was entirely referable to productivity, whereas in the last three decades of the twentieth century all the south's divergence must be attributed to decline in activity rates. On the whole, productivity played a pre-eminent role until the 1950s, but it was of minor importance in the rise of the Nec regions in the second half of the twentieth century, and for Italy as a whole since the 1970s.[28]

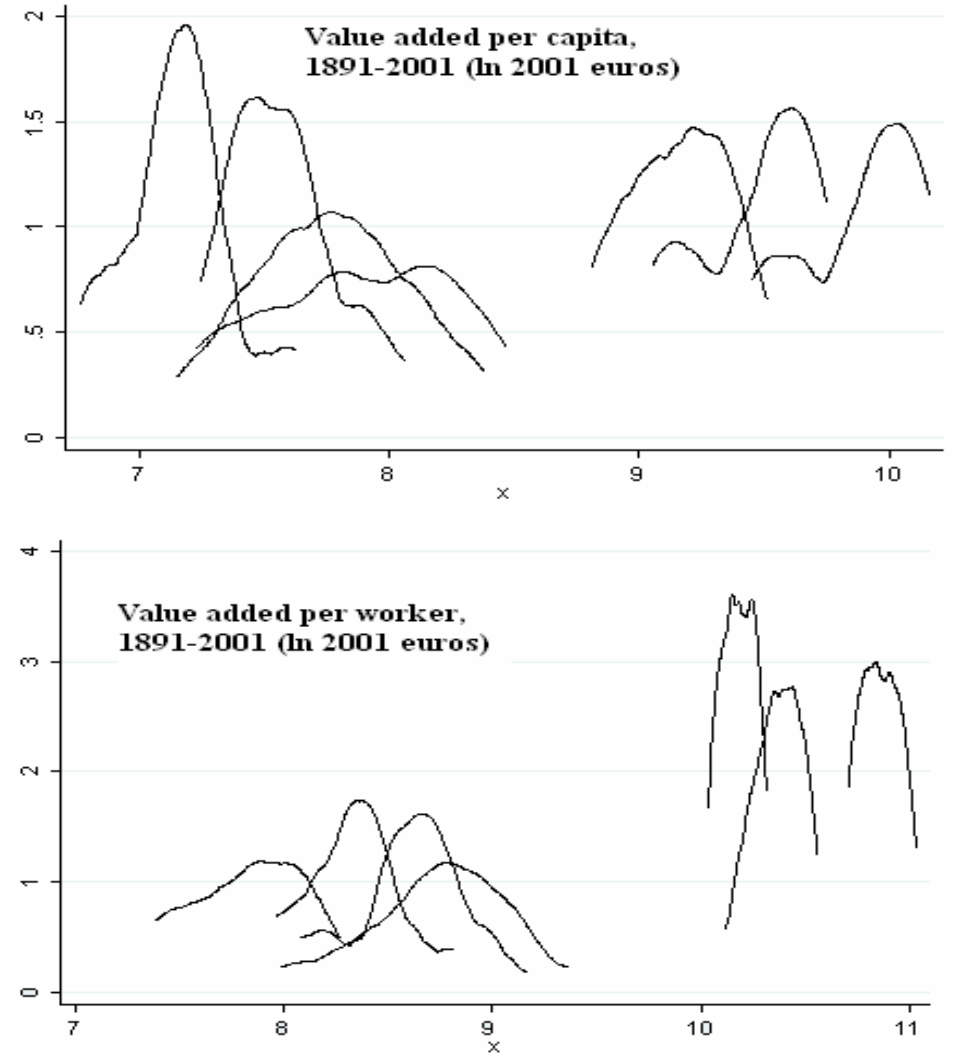
A comparison of Kernel densities, as from figure 3, gives us further confirmation. For value added per capita, this measure synthesizes the evidence of paragraph 1: from 1891 to 1951 dispersion increased, whereas differences within the three macro-areas were reduced, so much so that by 1951 three bell-shaped curves are visible, corresponding to North-West, Nec and *Mezzogiorno*. During the next two decades there was some convergence, but from the

[27] Again, following Daniele and Malanima (2007).

[28] Daniele and Malanima ('Il prodotto delle regioni') had already estimated the contribution of value added per worker and activity rates to the north-south divide, on a yearly basis from 1861 to 2004, limitedly to the centre-north and the *Mezzogiorno*. Although their results should be taken with some caveats since yearly value added estimates are not reliable until the 1970s, these support the view that productivity was the main determinant, from Unification until the 1970s; but not in the last decades.

1970s this process continued only for some regions. Others, the small bell-shaped curve in the left tail, were left behind: from Kernel densities, in value added per capita the 1970s truly stand as a watershed, since in the following years things remained more or less unchanged. Yet for productivity the story is different. In this case, the watershed must be located in the 1950 and 1960s: in the following decades, in fact, the left tail grouping the most backward regions did not form.

Figure 3. *Kernel densities of value added per capita and value added per worker, 1891-2001*




*Legend*: x is the logarithm of value added (at constant prices) in benchmark years, from 1891 in the left to 2001 in the right.

Over the long run, sigma convergence in productivity – as well as beta convergence, which is its precondition[29] – is confirmed by the Williamson index of dispersion for per worker value added, as from table 9. Conversely, in activity rates there was divergence: con-

[29] In a random-effects GLS regression analogous to the one in table 3, with value added per worker in place of value added per capita, the coefficient of the explanatory variable is negative (-0.0119), significant at the 1% level; the robust option leaves results unchanged, and the average growth rate is not correlated with its lag. We observe convergence also in the fixed-effects model. Full tables have been omitted for reasons of space.

cerning the whole period, the second half of the twentieth century, and the last two decades. Whereas until Second World War the movements of the two indices are synchronic, in the second half of the twentieth century they follow opposite directions: when there is convergence in per worker productivity, we record divergence in activity rates, and viceversa. Value added per worker and activity rates counterbalanced each other also (and even more) at the regional level:[30] with few exceptions, those regions which gained in the former, lost in the latter, and viceversa, so that the picture in terms of value added per capita remained more or less stable – but the fundamentals did not.

Table 9. *Indices of regional inequality in per worker productivity and activity rates, 1891-2001*

| | 1891 | 1911 | 1938 | 1951 | 1971 | 1981 | 2001 |
|---|---|---|---|---|---|---|---|
| Per worker productivity | | | | | | | |
| Italy | 0.210 | 0.194 | 0.227 | 0.281 | 0.136 | 0.127 | 0.099 |
| North-west | 0.141 | 0.142 | 0.116 | 0.099 | 0.045 | 0.044 | 0.034 |
| Center/north-east | 0.244 | 0.211 | 0.147 | 0.082 | 0.080 | 0.066 | 0.075 |
| South and islands | 0.208 | 0.170 | 0.197 | 0.175 | 0.071 | 0.044 | 0.045 |
| Activity rates | | | | | | | |
| Italy | 0.131 | 0.094 | 0.120 | 0.115 | 0.115 | 0.140 | 0.184 |
| North-west | 0.037 | 0.052 | 0.115 | 0.062 | 0.045 | 0.033 | 0.050 |
| Center/north-east | 0.175 | 0.023 | 0.092 | 0.025 | 0.051 | 0.085 | 0.068 |
| South and islands | 0.088 | 0.100 | 0.104 | 0.098 | 0.078 | 0.054 | 0.104 |

*Sources*: see text. The inclusion of additional regions in 1938 and 1951 do not alter the trend: without Trentino and Friuli, in 1938 the national index is 0.231 for per worker productivity, 0.122 for activity rates, and the center/north-east's index amounts to 0.147 and 0.088 respectively; without Aosta Valley, in 1951 the national index is 0.281 and 0.113 respectively, the north-west's index is 0.098 and 0.057 respectively.

[30] The Pearson correlations between changes in value added per capita and changes in activity rates are the following: –0.752** in 1891-911; 0.442 in 1911-38; –0.516* in 1938-51; –0.830** in 1951-71; –0.469* in 1971-81; –0.593** in 1981-2001 (* correlation is significant at the 5% level; ** correlation is significant at the 1% level). The negative correlation between the two variables is stronger in the second half of the twentieth century, and during the liberal age.

## 5. The origins of the North-South divide

As mentioned in the introduction, value added estimates can be helpful in order to reconsider the origins and extent of the north-south divide, which have been subject of debate since the late nineteenth century, when the *questione meridionale* was first raised by the press, historians, and economists.

So far, broadly speaking three different views have emerged. The first one, prevailing up to the 1990s, held that the at the time of Unification in 1861 the north-center regions, and in particular the north-western ones, were already more advanced: the argument is in line with the thesis proposed by Giustino Fortunato[31] at the turn of the previous century, who emphasized the 'natural poverty' of the south, due to dry climate, to the shortness of natural resources and in particular of hydraulic power, to the low levels of (what today we would call) human and social capital, to the feudal heritage in the land system. By contrast, the north-west was a natural candidate for industrialization, because of a better geographical position, more favourable natural endowments and more advanced human and social capital endowments. Moreover, in the mid nineteenth century it was undisputedly better off in terms of transport infrastructure, in the credit sector, as well as in some crucial manufactures such as the silk industry.[32] Luciano Cafagna[33] added to this argument that the north-western take-off occurred without pressure over the south's resources, because the two systems were truly separate, not complementary: in terms of trade, of labour market, of capital investments.

The opposite view has also been held, according to which the south was exploited by the north, in line with the dependency theory or the core-periphery approach. It echoed the arguments by Nitti,[34] who pointed out that southern Italy had larger monetary resources in 1860, which were redirected by the new Italian state in favour of northern infrastructures and indus-

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[31] *Il Mezzogiorno e lo stato.*

[32] For an overview, see Felice, *Divari regionali*, pp. 27-32, 168-70. In some cases, north-south economic differences have been dated back to the late medieval times (Abufalia, *The two Italies*), if not before, even to the Hannibalic wars (Toynbee, *Hannibal's legacy*): but a discussion on the most profound roots of the north-south divide is too far from the reach of this paper.

[33] 'Intorno alle origini'; *Dualismo e sviluppo*.

[34] *Scritti sulla questione meridionale*.

trialization (something never proved).[35] Marxist scholars,[36] following Antonio Gramsci,[37] focused on the land regime and on the mechanisms of accumulation, stigmatizing the alliance between big landowners in the south and industrialists in the north (*blocco agrario-industriale*), which maintained the *Mezzogiorno* locked in agrarian backwardness well up into the twentieth century. Rosario Romeo,[38] a pre-eminent liberal historian, did not reject this interpretative framework, although in his opinion the exploitation of the south was some sort of necessary or minor evil.[39] The corollary of this narrative is that the north-south divide emerged mostly in the first decades following Unification or, at least, that the north-west was not a natural candidate for industrialization; this approach also tended to regard the south as a sort of monolithic block, if not at the time of Unification (exceptions could be made for Campania), at least in the following decades.

The third and most recent approach looks more articulated. Stemming from the scholars grouped around the 'Istituto meridionale di storia e scienze sociali' (Imes), founded in 1986, and its review 'Meridiana', it argued, with the avail of some brilliant case studies,[40] that in the second half of the nineteenth century it was misleading to consider southern Italy as an uniform and backward area. As a whole the south may have ranked a bit below the centre-north, but the divide was relatively small. Above all, generalizations are to be considered wrong: some areas in the *Mezzogiorno* displayed important signs of modernity and dynamism, and often succeeded in making profit of the first globalization era via exporting primary products (Sicilia, Apulia) or even, when more backward, thanks to massive overseas emigration (Abruzzi, Calabria).

Of these three approaches, the last one seems more in line with present estimates, but these could be reconciled also with the first approach, not necessarily alternative. For 1891 and 1911, our data indicate a modest north-south divide, in contrast to sharp disparities within

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[35] Nitti considered only metallic currency, thus overestimating the wealth of the former southern kingdom. Furthermore, Nitti's method to calculate tax burden and state expenditures was convincingly criticized by Gini (*L'ammontare e la composizione*, pp. 268–77), whose alternative estimates indicate that the northern regions paid to the state more than they received.

[36] E.g. Villari, ed., *Il Sud nella storia d'Italia.*

[37] *La questione meridionale*.

[38] *Risorgimento e capitalismo.*

[39] This view has been re-proposed by Guido Pescosolido (*Unità nazionale*).

[40] E.g. Lupo, *Il giardino degli aranci*.

the Mezzogiorno. Of course we miss thirty years from Unification (1861), a period we don't know well yet. The debate is open. Recently Daniele and Malanima[41] have suggested that at the time of Unification the south was approximately at the same level of the north, but their figures are probably up-ward biased for the south, as the authors themselves recognize[42]. Early calculations, based on a variety of different sources of the time,[43] show instead that in 1861 and 1871 the divide was already present and, what is maybe more important, the opinion of coeval analysts and policy makers quite consistently did too.[44] If even we took for good the optimistic figures for 1861, these would not change the main finding that most of the divide took shape in the interwar years: the second approach could be accepted only if it would focus mostly on the interwar period, rather than on the liberal age as it does.

The significant disparities within the *Mezzogiorno*, which are revealed (or confirmed) by 1891 and 1911 estimates, may also suggest that some areas of the south had a potential for industrialization, not only the north-west – a finding in contrast with the first approach. Yet probably such a deduction would be incorrect. In the south, in fact, already at the time of Unification and quite uniformly (with only minor exceptions), literacy was dramatically low,[45] infrastructures lacking and natural resources too. In a prevailingly agrarian society, when estimates of value added per capita crucially depend on the amount of land and on population density, this indicator alone is not enough to tell us whether a region would be able to embark upon industrialization, and thus to discriminate between the first and the third approach.

It is worth adding that, on the long run, estimates do not justify some of the most recent arguments from the third approach: those which deny the historical category of *Mezzogiorno* and even its relative backwardness; and which, probably unwillingly, have paved the way to the recent overturn in the political debate, marked by the emergence of a 'northern problem', or *questione settentrionale*. On the contrary, a long-term approach confirms, for example, the worries and criticism by Galasso,[46] who keeps on regarding, correctly, southern Italy as an

[41] 'Il prodotto delle regioni', pp. 273–4.

[42] Malanima and Zamagni, '150 Years', pp. 8 and 20. Daniele and Malanima's estimate is obtained by extrapolating 1891 present estimates for services and agriculture, and by computing Fenoaltea's first generation ('Peeking backward') 'optimistic' estimates for 1871.

[43] Eckaus, 'The North-South Differential'; Esposto, 'Estimating'.

[44] E.g. Sella, *Discorsi parlamentari*.

[45] Felice, 'I divari regionali in Italia'.

[46] *Il Mezzogiorno da 'questione' a 'problema'*.

unresolved problem and warns against overlooking its economic and social specificity. In my view, differences and advances in the southern regions must be considered, sometimes emphasized, but not exaggerated. If during the twentieth century the south converged in terms of life expectancy and (with more caveats) human capital,[47] that is in crucial social indicators, it did not in social capital.[48] Above all, the north-south economic divide widened and, from (at least) the early twentieth century until our days, in value added per capita *all* the southern regions have been ranking permanently below the national average. Convergence occurred within the southern regions: indeed, it was during the twentieth century that the *Mezzogiorno* imposed itself as an economic category.

### 6. Migration and regional policies

Together with value added per capita, figures on productivity and activity rates may help to shed some light on the determinants of convergence. Of these, migration is an obvious candidate: in the regions of origin, it should favour a rise in value added per worker, since the wages of those who remain tend to increase and, less obviously, because those who emigrate are usually from less productive jobs.[49] However, as long as migration involves predomi-

[47] Idem, *Divari regionali*, pp. 108–17, 139–55.

[48] Nuzzo, 'Un secolo di statistiche sociali'; Cartocci, *Mappe del tesoro.*

[49] At least, this was the rule during both the first globalization and the golden age. The evidence that southern emigrants were somehow better than those who remained (i.e. positively selected, for example with higher human capital) is very weak, at least for what regards the Mezzogiorno. Between 1899 and 1910, 53.9% of the immigrants from the *Mezzogiorno* to the United States were illiterate, against only 11.5% of those emigrating from the rest of the country (Ciuffoletti and Degl'Innocenti, *L'emigrazione*, p. 442). For a comparison, consider that in 1901 the share of illiterate people out of the male population was 70% in the south (but 62% in the male population, where most of the immigrants came from), 35% in the centre-north (30% in the male population); in 1911, the share of illiterate people had decreased to 59% in the South, 25% in the rest of the country (my elaborations from Vasta, 'Capitale umano', pp. 1052-3). Although elaborations are missing, probably southern emigrants did not embody higher human capital neither in the 1950s and 1960s, since they came mostly from the shrinking agricultural sector; conversely, they probably are positively selected in the last and smaller south-north emigration, which has begun in the mid 1990s and is still going on. There is some – but very specific – evidence that during the liberal age emigrants had a higher civicness than those who remained (see Galtung, *Members of Two Worlds*, pp. 190–1), but the corollary of a worsening social capital in the south is, at best, highly controver-

nantly (male) workers, as it is usually the case, in the home regions the rise in value added per worker may be partly offset by a decline in activity rates. Broadly speaking, the stronger is the rise in per worker productivity as compared to the decline in labour force participation (which may indicate that emigrants are indeed a rational response to an exceeding labour supply, or to a scarce labour demand), the more beneficial is emigration for the home country.

During the liberal age a massive international emigration (*grande emigrazione*) took place, with growing numbers from the southern regions and in particular from the poorest ones, Abruzzi, Lucania, Calabria; but it also heavily involved important areas of the Nec, Veneto above all.[50] Estimates tell us that from 1891 to 1911 southern Italy as a whole declined in terms of value added per capita, but at a very slow rate. Indeed, outside the industrial triangle Abruzzi, Lucania, Calabria and Veneto rank among the five best performing regions in 1891-911 – the other is Emilia – which either converged towards the north-west (Abruzzi, Calabria, Veneto), or diverged less (Lucania).[51] All these four regions improved in terms of value added per worker (Abruzzi, Calabria, and Lucania were the only ones in the south), whereas their decline in activity rates was relatively modest.

Since the early twentieth century, the positive consequences of emigration on some of the poorest southern regions were recognized by coeval Italian scholars.[52] At the international level, a well-established literature has recognized and emphasized the positive impact of the great emigration on the home regions.[53] Present estimates for 1891 and 1911 support this lit-

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sial (see the recent estimates by Nuzzo, 'Un secolo di statistiche sociali', as well as Putnam, *Making democracy work*, and the discussion in the following section).

[50] For figures, see Felice, *Divari regionali*, p. 46. Out of 14 millions of Italian emigrants from 1876 to 1914, 3.22 came from Veneto, 1.51 from Piedmont, 1.46 from Campania, 1.34 from Sicily, 1.32 from Lombardy, 1 million from the Abruzzi, 0.87 from Calabria; 5.5 from all of the *Mezzogiorno*. Compared to population, the regions with most emigrants were Veneto (with an annual gross migration rate of 2.7%), Basilicata (2.0), Calabria (1.7), Abruzzi (1.5), Campania (1.2); in the south, the annual gross migration rate was about 1.1 for all the period, 1.4 if we consider only the 1886-1914 years, when emigration was more intense. The figures above do not consider return migration, most probably higher in the centre-north since there European destinations were preferred there to transoceanic ones, unlike in the south.

[51] Yet correlation tests suffer from the limited number of cases, and from the fact that the north-western regions, which improved in per capita Gdp, scored a migration rate below the national average; Campania fell behind, although its migration rate was slightly above the national average.

[52] E.g. Croce, *Storia*, p. 207.

[53] E.g. Williamson, 'Globalization'.

erature but, given the lack of other crucial indicators at a regional level (namely regional wages before the great emigration began),[54] an attempt to calibrate the contribution of globalization on the pattern of the single regions or macro-regions – rather than on Italy as a whole, as Taylor and Williamson did –[55] is too far from the reach of this article. Rather, here it is worth warning against misjudging what figures and indicators (value added per capita) actually mean: we must consider that the emigration cumulative impact on population was huge[56] – particularly in Abruzzi, Calabria, and Lucania. In other words, the living conditions of those who remained in the home regions were probably improved as compared to the rest of the country, but the total economic product of Abruzzi, Calabria, and Lucania was not: in absolute terms, the poorest southern regions declined during the liberal age, their percentage of value added (out of the national total) going down from 3 to 2.8 in the Abruzzi, form 1.2 to 1 in Lucania, from 2.9 to 2.8 in Calabria. In Veneto the story was different: although here the cumulative impact on population was at least as dramatic as in the south, the regional share of value added increased from 7.8 to 8.8.[57] This finding may indicate that in the south the benefits per emigrant were lower than in the rest of the country. In turn, this could be due to a number of reasons (lower education, preference towards far-away lands with less returns and per capita remittances) all referable to the fact that the southern regions were still too backward and peripheral to benefit from emigration, as did other areas closer to the core.[58]

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[54] The pioneering work by Ercole Sori reports wages only from 1905, and moreover is inconclusive about their correlation with migration (*L'emigrazione italiana*, p. 171).

[55] 'Convergence'.

[56] From 1891 to 1911, in the south the gross cumulative impact was about 36%, peaking to almost 60% in Abruzzi, Lucania, and Calabria. In Veneto, it was around 90%. Elaborations from Felice, *Divari regionali*, p. 46, and population censuses. Again, it is worth reminding that these figures do not consider return migration.

[57] On the whole, the share of value added declined from 34.8 to 32.2 in the Mezzogiorno, whereas it increased from 34.2 to 34.7 in the Centre North, where the cumulative impact (without considering return migration) was indeed a bit higher (39%, against 36 in the south).

[58] O'Rourke and Williamson ('Around the European Perihpery'), stigmatized that the performance of Italy was disappointing as compared to other European countries: given its huge emigration, it could have done better in terms of convergence in per capita and per worker Gdp. This conclusion would probably be different if we could split the south from the rest of the country.

In the interwar years international emigration came to a halt, whereas internal south-north movements emerged not before the late 1930s.[59] Since from 1911 to 1951 the south's falling back was mostly due to value added per worker, the lack of migration could have been a major determinant: regional inequality increased, not by chance, during the years of international isolation. Also the expansive demographical policy of the fascist regime may have had a negative impact,[60] as long as it raised the birth-rates of the poorest in the south and thus indirectly favoured the decrease of both value added per worker and activity rates.

After Second World War a huge emigration outflow was restored, mostly from the southern regions, which lasted approximately until the 1970s: it was now directed not only to foreign countries, but also towards the north-west – thus possibly 'doubling' its impact on regional convergence, being on both sides.[61] Value added estimates indicate that in this case the benefits from emigration were more substantial: for example, in terms of productivity the south improved visibly in all the three sectors, agriculture, industry, and services. As a consequence, it may be argued that massive emigration had a minor positive impact when *Mezzogiorno* and Italy as a whole were more backward, i.e. in the first globalization era. This finding would be consistent with the well-established view that international (and interregional) openness can promote convergence only after a certain threshold is overcome.

And yet there is something more. Table 7 told us that from 1951 to 1971 the big leap forward was made within the industrial sector (from 0.64 to 0.89); the rise in the south's industrial productivity (+25 percentage points) more than doubled that in the tertiary sector (+11), and was between three and four times more the one in agriculture (+7), where most of the unskilled southern emigrants came from. Of course, emigrants ended up in the northern industrial factories and thus, it may be argued, they contributed to lower industrial productivity in

[59] During the 1920s and 1930s there were significant migration movements toward Latium, the capital region, although here too immigration increased remarkably only after the Second World War (the total net migration passed from 117 thousands in 1931-36 to 251 thousands in 1951-61; in Lombardy the net migration was -9 thousands in 1931-36, but increased to 508 thousands in 1951-61). For regional figures, see Treves, *Le migrazioni*, pp. 176–9.

[60] E.g. Bevilacqua, *Breve storia dell'Italia meridionale*, pp. 172–9.

[61] From 1951 to 1971, out of about 4 million migrants from the southern regions, about half directed toward the centre-north. The north-west received about 2 millions immigrants from other Italian regions (not all from the south), Latium about 500 thousands. Elaborations from Acquaviva and Santuccio, *Social Structure*, p. 33; Cao-Pinna, 'Quadro generale', p. 42; Termote, Golini, and Cantalini, *Migration*, p. 49.

the north. But this can hardly explain such a high speed of convergence in industrial productivity. All the more because, and here we come to the core of the second reason, at the same time in the south the industrial labour force increased as well, as never before (nor later).

The rise of productivity and labour force in industry during 1951-71, i.e. the main determinant of the south's convergence, should thus be attributed also to something else. The obvious candidate is policy, i.e. the massive regional policies pursued by the state through the public agency 'Cassa per il Mezzogiorno', created in 1952. This was probably the largest regional policy set up by a western-European country, at least in terms of total amount of funds, throughout the cold war.[62] The *Cassa* carried out a wide range of infrastructural works – roads, aqueducts, and others – with crucial benefits especially in the first two decades;[63] during the 1960s it concentrated on the industrial sector, where it largely supported heavy industries with high capital/labour ratios. From the reports of the *Cassa*, which record the projects financed and the expected employment, the total industrial labour force prompted by public subsides can be estimated (with some cautiousness) at around 250-300 thousands units,[64] amounting to about one fifth of the south's industrial employment in 1971: this had increased by around half a million from 1951 to 1971, which means that around 50-60% of this rise was financed by the *Cassa*. As mentioned, these funds were overwhelmingly directed towards highly capital-intensive sectors, namely engineering and chemicals which totalized 34% of the state subsidies in 1951-61, 62% in 1962-68.[65] Given this premise, the south's convergence in industrial productivity, as well as its industrialization, does not come as a surprise. The joint effect of emigration and regional policy resulted into unprecedented catching-up, all the more outstanding since it took place during the economic boom of the Italian economy, when also the centre-north grew at a remarkable speed.

In the 1950s and 1960s, however, regional policy did not create the conditions for autonomous development. The very choice of supporting capital intensive activities, in an area so rich in labour as the *Mezzogiorno* was, instead for example of promoting tourism,

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[62] Felice, 'Le politiche regionali'.

[63] D'Antone, '"Straordinarietà" e Stato ordinario'; for Abruzzi, see Felice, 'The "Cassa per il Mezzogiorno" in the Abruzzi'.

[64] Around three/fourths of the expected increase in employment (350 thousands, a half of which only from 1966 to 1970). Elaborations from Cassa per il Mezzogiorno, *Bilancio 1970* (p. 73), *Bilancio 1966* (p. 63), *Bilancio 1964-'65* (p. 208).

[65] Felice, *Divari regionali*, p. 90.

would have turned out to be a short-sighted policy – a mistake probably due to the economic milieu of the time.[66] These faults became clear during the 1970s crisis, which involved the collapse of large part of the new heavy industries in the south: having failed the top-down strategy, and without a new and consistent approach, regional policy redirected towards unproductive expenditures, in such a way that it probably even favoured the enforcement of organized crime and the decline of social capital.[67] In the 'agony' of regional policies, as Cafiero wrote,[68] a sort of 'vicious circle' came into being. It is worth noticing that, in terms of total expenditures, regional policies reached their peak in 1975 (1.23% as a share of Italy's Gdp), but were still high by the mid 1980s (around 0.5% of Italy's Gdp), after the *Cassa* had been substituted by the short-lived Agensud (1984-1992).[69] The evidence that they continued to be important for many years, but ineffective, discredited them before the public opinion. Yet a pondered assessment should separate the early period (1950s and 1960s) from the following one of progressive deterioration and even distinguish, in the early period, substantial although short-term benefits from interventions that proved mistaken.

## 7. The Italian case and the role of social capital

How does the Italian case rank in the light of the literature on regional convergence and of the evidence for other countries? Cross-country convergence research is very abundant, but for what concerns regional analysis, particularly in the long run, data are still few and the interpretative framework not very elaborate. Almost half a century ago, a pioneering work by Jeffrey Williamson[70] laid the basic mathematics of a model. The author proposed to extend the Kuznets' inverted U-shaped function to the relationship between per capita value added and regional inequalities: rising divergence during the early stages of industrialization, then

[66] Fenoaltea, 'I due fallimenti'.

[67] This line of causation was first stigmatized by Trigilia, *Sviluppo senza autonomia*, and since then remarked by many authors (e.g. Bevilacqua, *Breve storia dell'Italia meridionale*, pp. 126–32).

[68] Cafiero, *Storia dell'intervento straordinario.*

[69] To have a comparison, in the United Kingdom regional policies went barely above 0.5 of total Gdp even at their peak (1968-1976), and usually remained well below this threshold (around 0.2-0.3% in the 1980s). See Felice, 'Le politiche regionali', pp. 188–9 and 222.

[70] 'Regional inequality'.

convergence after industrialization spread. This simple suggestion proved to be adequate to account for the pattern of regional inequality in the US economy: evidence confirms divergence from the late nineteenth to the early twentieth century, as industrialization increased in the north-east and then expanded to the north-center regions; during the second half of the twentieth century, southern and western economies industrialized as well and thus converged.[71] In Europe, a similar pattern can be observed in Spain: although estimates of regional Gdp are still preliminary, they point towards rising divergence in the early stages of industrialization until approximately 1960, then convergence from the 1960s.[72] For Britain, apparently evidence is discordant: estimates by Crafts[73] indicate that regional inequality was rising during the first globalization era, declined from the First World War to the 1970s, and then rose again in the second globalization; but Britain undertook industrialization well before Italy and Spain, and so convergence can be attributed to the subsequent spread of industrialization, whereas the recent divergence belongs to a different story, that of deindustrialization. From purely theoretical grounds, both the cumulative approach of the new economic geography,[74] and the neo-classical school with broadly-defined capital and a limited role for diminishing returns,[75] can be easily reconciled with the inverted U-shaped function: the former emphasizes the economies of scale in the phase of divergence and the costs of congestions in the following convergence, the latter relies upon decreasing returns to capital in the production function (to explain convergence), which at the early stages may be prevented by conditioning variables such as inadequate human or social capital.

The Italian case seems to fit quite badly in this framework. In Italy industrialization was relatively slow, also in the most advanced areas: it took place through different 'waves', the most intense of which came late, in the economic boom of the 1950s and 1960s. At the early stages of industrialization, during the Giolitti's years when the industrial triangle took shape, regional imbalances in per capita value added remained more or less unchanged, probably

[71] Barro and Sala-i-Martin, 'Economic growth'. See also Kim, 'Economic integration'.

[72] Carreras, 'Fuentes y datos'. New estimates by Martínez-Galarraga ('New estimates') indicate stronger divergence in the first globalization era, a finding in line with the work by Rosés ('Why Isn't') about industrial location from the new economic geography perspective.

[73] 'Regional GDP'.

[74] Krugman, 'Increasing returns'.

[75] E.g. Barro and Sala-i-Martin, 'Convergence'.

mitigated by the great migration;[76] they increased in the interwar years, an intermediate age which was neither take-off nor intense economic growth; and surprisingly they decreased during the economic boom, notwithstanding the most industrialized regions grew at their fastest speed. In short, in Italy regional inequality increased in years of hardships, tended to decrease when the economy boomed. Like in cross-country comparisons, within Italy a 'differential of contemporaneousness'[77] was probably at work, i.e. negative shocks struck more heavily the weakest regions. But the common institutional framework and the national state did play some role: convergence during the economic boom was exceptional as long as it was due to interregional migration, which was allowed to be free across the Italian regions, and to the massive regional policies pursued by the public agency 'Cassa per il Mezzogiorno'. The migration exodus from the south was such as to cause the observed convergence to take place in per head output more than in total output, whereas the public intervention made it temporary: top-down industrialization in the south was prompted and even forced by state intervention – and this could not be accounted for by models based on concurrence and market rules – but probably for this very reason it was also more exposed to subsequent downturn.

But even after allowing for migration and regional policies, something more must be said in order to reconcile the Italian case with international models. In fact, and here we come to a second discrepancy, southern Italy was expected to converge also, or at least, during the last decades. The fact that this did not happen is by far the main anomaly of the Italian case. Neoclassical cross-country models would search for an explanation in the role of conditioning variables, such as low levels of social capital or institutional failure. But models about regional convergence are badly equipped to deal with conditioning variables, since they usually assume – as normally is the case – that these have a limited role across the regions of a same country over the long run, characterized by a common institutional framework and by many similar social and cultural features. The main difficulty in reconciling the Italian case with international models lies in this assumption, which may be simply untrue for the Italian regions, especially with reference to social capital. In fact, if we limited the analysis to a comparison between north-west and Nec, where we could reasonably assume that conditioning variables

[76] Which instead was almost absent in Spain; for a cross-country comparison, see Taylor and Williamson, 'Convergence', p. 29

[77] Pollard, *Peaceful conquest*.

or fixed effects were not at stake, we would have a pattern approximately in line with predictions by international literature.

By and large, our historical picture seems to support what is today the most popular explanation for the persistent backwardness of the south, i.e. lower social capital, and the somehow correlated institutional failure and pervasiveness of organized crime; not by chance, the southern regions free from organized crime (Abruzzi and Molise, Lucania, Sardinia) are the only ones to have (slowly) converged in the last decades. However, until the 1980s only a few scholars had warned against overlooking the problems of southern society,[78] since it was commonly believed that economic development would have favoured as well cultural and social change. But Banfield's original argument about amoral familism[79] has been revived in the last two decades,[80] after the disappointing results of regional policies had become apparent, and gained a vast international echo.

According to Robert Putnam,[81] north-south differences in social capital and thus in institutional performance may date back to medieval times.[82] More recently, Giorgio Nuzzo has presented a measure of social capital at the regional level in benchmark years since 1900 until our days, which confirms the existence of a sharp and persistent north-south divide: with moderate convergence in the years of economic boom, but divergence again since the 1970s.[83] Some analyses have been proposed to explain as well the south's backwardness in the nineteenth century, for example for what regards the role of social capital in textile activities[84] or cooperative banks,[85] with an approach sensitive to micro-foundations, but on this the literature is at the present inconclusive, due to the possible endogeneity between social capital and economic conditions.[86] For the last decades of the twentieth century research is much more abun-

[78] Zamagni, *Industrializzazione e squilibri*, p. 216.

[79] Banfield, *The moral basis*.

[80] The latest example is Alesina and Ichino (*L'Italia*, pp. 6–14), who even extended it to the all of Italy.

[81] Putnam, *Making democracy work*.

[82] See also Tabellini, 'Culture and Institutions'.

[83] Throughout the period from 1901 to 1961, in the south social capital was around 50-65% of the national average. By 1971 it had increased to 74%, but in 1981 had fallen to 65%. Nuzzo, 'Un secolo di statistiche sociali'.

[84] A'Hearn, 'Institutions, externalities, and economic growth'

[85] Idem, 'Could southern Italians cooperate?'.

[86] Galassi, 'Measuring social capital'.

dant, and a number of studies,[87] usually at the macro level and via econometric tests, by now agree in assigning to low social capital, institutional failure and organized crime a pre-eminent part in the south's falling back.

From the perspective of this essay, it would make little sense to replicate those efforts, which moreover are usually based on yearly – not benchmark – estimates. Rather, it is worth adding that our evidence, pointing to the fact that the recent south's divergence is due to decreasing activity rates, gives more strength to the social capital explanation, at least for two reasons. First, a backward society relying upon (amoral) familism, as southern Italy supposedly is, tends to maintain lower employment rates, *in primis* of female workers; all the more if it is no longer an agricultural economy, where rural house-wives may be counted in the labour force. Second, workers in illegal activities, which expanded in the south during the last decades for the rise of criminal organizations (*Mafia* in Sicily*, Camorra* in Campania*, 'Ndrangheta* in Calabria*, Sacra Corona Unita* in Apulia), as well as for a widespread moral and social attitude to escape state control, are often not considered in the official accounts, with the consequence of unreal lower rates of activity rates.

Maybe more importantly, historical estimates can be useful to re-discuss the role of social capital over the long run and to reformulate the endogeneity problem. If we accept both the ideas that the south's backwardness in social capital dates back to medieval times, and that this has always negatively affected economic performance, then we should find a *Mezzogiorno* always – and more or less uniformly – backward as compared to the centre-north. Conversely, our estimates indicate that in the second half of the nineteenth century this was not the case, with some important regions (Campania, Apulia, even Sicily) probably not so behind the rest of the country: maybe they were not so backward in social capital, or this was not the prime determinant of economic performance at that time – or both. Since the most recent estimates (those by Nuzzo) confirm that a sharp north-south divide was already present, we should opt for the latter: social capital may well have grown in importance during the course of twentieth century, so much so that at a certain point it hampered the further convergence of the south. The causation link, at least at the macro level and in economic – not statistical – terms, seems to go from social capital to economic conditions, rather than viceversa (although this latter was also present): more properly, low levels of social capital in the south hindered the take off towards modernity – in the 'western' sense of the word, including market rules

[87] E.g. Lyon, 'Making capitalism work'.

and impersonal business relations – i.e. the passage from an advanced agricultural economy to an advanced industrial (and later tertiary) one. This is the story broadly consistent with the available regional estimates of value added and social capital spanning from the late nineteenth century until our days, pending a further refinement of social capital estimates, where there is still much work to do (and of course, value added estimates at the time of Unification are also needed).

At the present, the available estimates allow us to draw a simple econometric test, following the neo-classical approach. For this purpose, we can avail the cited work by Giorgio Nuzzo,[88] who adopts a definition similar to that of Putnam and offers a reconstruction of social capital for the Italian regions from 1901 to 2001, in benchmark years. Nuzzo's index is a simple mean of social participation, political participation and trust: the first is measured by the average of the densities of different no profit institutions; political participation is measured by the average of the densities of political no profit institutions, of the shares of voters out of total population at different elections, and of an informal indicator based on polls drawn from 1993 to 2003 about political engagement; trust is measured by the inverse of an average of estimates of violent criminality, of court proceedings, as well as of the share of perceived criminality as resulting from polls conducted in 1995 and 2003. To my knowledge, up to now this is the only work which gives a century-long view of social capital for the Italian regions through a coherent methodology, although still many qualifications could be made to the estimates. In order to render them comparable with the figures on value added and human capital, I have reconstructed two more benchmarks, 1871 and 1891, through a methodology which directly associates my results to the Nuzzo's ones.[89] The estimates of social capital for Italys' regions are shown in table 10.

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[88] 'Un secolo di statistiche sociali'.

[89] More precisely, social participation is estimated via the total members of friendly societies, as a ratio of population: first, data for 1904, 1895 and 1873 have been used to create 1871, 1891 and 1901 benchmarks, via linear interpolation with the continuous compounding yearly rate; secondly, for 1901 the linear correlation between the number of members and the Nuzzo's index of social participation (the dependent variable) has been tested, resulting very high ($R^2$ 0.706, F 33.671 and significant at the 0.001 level, beta coefficient of the number of members 0.892 and significant at the 0.001 level); thirdly, 1891 figures have been estimated by maintaining for every region the 1901 ratio social participation / number of members, then re-proportioning figures with the regional population; lastly, this procedure has been repeated for 1871, using the 1891 new estimate of social participation; the number of friendly societies and the total amount of deposits of the *banche popolari* have been tested too,

Table 10. *Regional inequality in social capital, 1871-2001 (Italy=1)*

| | 1871 | 1891 | 1911 | 1938 | 1951 | 1971 | 1981 | 2001 |
|---|---|---|---|---|---|---|---|---|
| Piedmont | 1.163 | 1.405 | 1.451 | 1.229 | 1.210 | 1.098 | 1.128 | 1.048 |
| Aosta Valley | - | - | - | - | 1.668 | 1.763 | 1.514 | 1.493 |
| Liguria | 1.337 | 1.306 | 1.189 | 1.091 | 1.040 | 1.022 | 1.091 | 1.050 |
| Lombardy | 1.313 | 1.449 | 1.364 | 1.196 | 1.179 | 1.087 | 1.067 | 1.096 |
| *North-west* | *1.255* | *1.414* | *1.373* | *1.195* | *1.174* | *1.087* | *1.091* | *1.081* |
| Trentino-Alto Ad. | - | - | - | 4.519 | 3.979 | 3.626 | 3.134 | 2.057 |
| Veneto | 0.725 | 0.971 | 1.113 | 1.055 | 1.055 | 1.128 | 1.257 | 1.255 |
| Friuli | - | - | - | 1.285 | 1.288 | 1.384 | 1.552 | 1.349 |
| Emilia | 1.239 | 1.120 | 1.231 | 1.131 | 1.206 | 1.093 | 1.297 | 1.272 |
| Tuscany | 1.669 | 1.437 | 1.359 | 1.309 | 1.334 | 1.169 | 1.303 | 1.247 |
| The Marches | 0.626 | 0.687 | 0.834 | 0.997 | 1.125 | 1.051 | 1.205 | 1.239 |
| Umbria | 1.292 | 1.166 | 1.198 | 1.115 | 1.112 | 1.125 | 1.331 | 1.366 |
| Latium | 1.627 | 1.306 | 0.919 | 0.798 | 0.812 | 0.867 | 0.796 | 0.804 |
| *Center/north-east* | *1.169* | *1.130* | *1.152* | *1.228* | *1.231* | *1.181* | *1.260* | *1.193* |
| Abruzzi | 0.417 | 0.621 | 0.629 | 0.665 | 0.661 | 0.726 | 0.887 | 1.131 |
| Campania | 0.560 | 0.476 | 0.505 | 0.514 | 0.542 | 0.659 | 0.374 | 0.430 |
| Apulia | 0.846 | 0.734 | 0.586 | 0.650 | 0.682 | 0.711 | 0.548 | 0.748 |
| Lucania | 0.454 | 0.596 | 0.697 | 0.573 | 0.557 | 0.789 | 0.785 | 0.830 |
| Calabria | 0.421 | 0.351 | 0.483 | 0.548 | 0.541 | 0.738 | 0.817 | 0.654 |
| Sicily | 0.982 | 0.741 | 0.722 | 0.680 | 0.669 | 0.806 | 0.733 | 0.823 |
| Sardinia | 0.695 | 0.669 | 0.510 | 0.632 | 0.799 | 0.914 | 1.045 | 1.095 |
| *South and islands* | *0.673* | *0.605* | *0.596* | *0.613* | *0.630* | *0.743* | *0.646* | *0.728* |

*Source:* elaborations from Nuzzo (2006). For 1871 and 1891, see the text. 1938 figures are linearly interpolated between 1921 and 1951 with the continuous compounding yearly rate.

alone or in combination (also with the number of members), but resulted uncorrelated with Nuzzo's figures. Political participation is estimated via the number of political newspapers published in 1880, 1891, 1895 and 1905, which, as a ratio of population, have been used to create 1871, 1891 and 1901 benchmarks (for 1901, my benchmark is weakly correlated with the Nuzzo's index of political participation, the dependent variable: $R^2$ 0.327, F 6.311 and significant at the 0.05 level, beta coefficient of the number of political newspapers 0.219 and significant at the 0.05 level; excluding Sardinia which was an outlier in Nuzzo's figures); the estimating procedure is analogous to that used for social participation, and of course in this case data are correlated with the Nuzzo's index of political participation. Trust is approximated through the inverse of an average of criminal and civil court proceedings in 1901-04, 1891 and (only criminal) 1871 (for 1901, my benchmark was highly correlated with the Nuzzo's index of trust: $R^2$ 0.819, F 58.757 and significant at the 0.001 level, beta coefficient of our indicator 0.845 and significant at the 0.001 level; excluding the Marches which was an outlier in Nuzzo's figures); the estimation procedure is analogous to that used for the other two dimensions, in this case the data being correlated with the Nuzzo's index of trust; since for 1871 only criminal statistics were available, these were in turn correlated with criminal statistics in 1891. All data are from Ministero di agricoltura, industria e commercio (1878; 1881; 1893; 1900; 1908).

The results of the growth regressions, which incorporate social capital as a conditioning variable, are shown in table 11. Social capital may have acted as a conditioning variable during the interwar years and the last decades, whereas it did not contribute to the convergence of the 1950s and 1960s. Of course, social capital could be just a redundant variable, for example after human capital (or viceversa): indeed, the results of the growth regressions with human capital as a conditioning variable (table 12) are very similar.

In these models, we have too few observations to draw firm conclusions from the results. With this caveat, at the first instance the problem of multiplicity of regressors can be investigated by running together human and social capital in the growth regressions. The results suggest that social capital is the redundant variable for all the 1891-1951 period. But in the last two decades the redundant variable is human capital. In short, we have a first and longer phase (1891-1951) when human capital was more correlated with value added growth, followed by a second one (1951-1971) when both human and social capital are uncorrelated with economic growth, and a final phase (the last decades) when is social capital more correlated (from these premises, unsurprisingly the results of the dynamic panel are inconclusive). Once again, cautiousness is warranted in all the regression models, because the independent variables are highly correlated and thus the results very sensitive to small changes in the observations. Imperfect and questionable as they are, however, these results are in line with the hypothesis of a growing role of social capital over the course of the twentieth century.

Table 11. *Conditional convergence of the Italian regions (1891-2001): adding social capital*

| | Cross-section linear regressions | | | | | | DPD, linear regression (robust) | |
|---|---|---|---|---|---|---|---|---|
| | 1891-1911 | 1911-1938 | 1938-1951 | 1951-1971 | 1971-1981 | 1981-2001 | Fixed effects | GMM |
| Constant | 0.027 | 0.021 | 0.070 | 0.131 | 0.027 | 0.029 | 0.0025 | -0.0328 |
| Standard error | 0.036 | 0.040 | 0.056 | 0.008*** | 0.069 | 0.018 | 0.0102 | 0.0621 |
| $B_1$ | -0.001 | -0.004 | -0.012 | -0.011 | -0.001 | -0.001 | 0.0017 | -0.0611 |
| $B_1$ standard error | 0.005 | 0.006 | 0.008 | 0.001*** | 0.008 | 0.002 | 0.0011 | 0.1223 |
| $B_2$ | 1.61E-005 | 0.014 | 0.035 | 5.66E-005 | 0.004 | 0.002 | 0.0031 | 0.0483 |
| $B_2$ standard error | 0.004 | 0.004*** | 0.010*** | 0.001 | 0.003 | 0.001** | 0.0018* | 0.0635 |
| $R^2$ | 0.011 | 0.593 | 0.529 | 0.892 | 0.162 | 0.295 | 0.039 | 0.58(1) |
| N | 16 | 16 | 18 | 19 | 19 | 19 | 107 | 104 |

Dependent variable: Ln value added growth rates by sub-period ($t_1 - t_0$). (1) Wald Chi2.

Independent variables: Ln value added ($B_1$) and social capital ($B_2$) in $t_0$.

In the GMM DPD, the independent variables are the Ln of value added growth rates by sub-period ($t_0 - t_{-1}$), instrumented using Ln value added in $t_{-1}$, and social capital in $t_1$; the robust option was preferred because GMM two-step standard errors are biased, indicating heteroschedasticity.

In all the regressions social capital is instrumented using its lag (OLS method).

* Significant at the 0.1 level. ** Significant at the 0.05 level. *** Significant at the 0.01 level.

*Source*: elaborations from tables 1 and 10.

Table 12. *Conditional convergence of the Italian regions (1891-2001): adding human capital*

| | Cross-section linear regressions | | | | | | DPD, linear regression (robust) | |
|---|---|---|---|---|---|---|---|---|
| | 1891-1911 | 1911-1938 | 1938-1951 | 1951-1971 | 1971-1981 | 1981-2001 | Fixed effects | GMM |
| Constant | 0.059 | 0.018 | 0.130 | 0.131 | 0.198 | 0.040 | -0.0018 | -0.4277 |
| Standard error | 0.018*** | 0.037 | 0.052** | 0.012*** | 0.097* | 0.022* | 0.0125 | 0.1303*** |
| $B_1$ | -0.006 | -0.004 | -0.032 | -0.011 | -0.030 | -0.006 | 0.0016 | -0.2659 |
| $B_1$ standard error | 0.003** | 0.005 | 0.009*** | 0.002*** | 0.014* | 0.004 | 0.0015 | 0.1527* |
| $B_2$ | 0.006 | 0.016 | 0.127 | 0.000 | 0.103 | 0.034 | 0.0082 | 0.4587 |
| $B_2$ standard error | 0.002*** | 0.005*** | 0.026*** | 0.006 | 0.038** | 0.016* | 0.0069 | 0.1276*** |
| $R^2$ | 0.486 | 0.631 | 0.682 | 0.892 | 0.329 | 0.225 | 0.334 | 15.28(1) |
| N | 16 | 16 | 18 | 19 | 19 | 19 | 107 | 104 |

Dependent variable: Ln value added growth rates by sub-period ($t_1 - t_0$). (1) Wald Chi2.

Independent variables: Ln value added ($B_1$) and human capital ($B_2$) in $t_0$.

In the GMM DPD, the independent variables are the Ln of value added growth rates by sub-period ($t_0 - t_{-1}$), instrumented using Ln value added in $t_{-1}$, and human capital in $t_1$; the robust option was preferred because GMM two-step standard errors are biased, indicating heteroschedasticity.

In all the regressions human capital is instrumented using its lag (OLS method).

* Significant at the 0.1 level. ** Significant at the 0.05 level. *** Significant at the 0.01 level.

*Source*: elaborations from tables 1; for human capital estimates, see Felice, Divari regionali, pp. 144-50.

Table 13. *Conditional convergence of the Italian regions: adding human and social capital (1891-2001)*

| | Cross-section linear regressions | | | | | | DPD, linear regression (robust) | |
|---|---|---|---|---|---|---|---|---|
| | 1891-1911 | 1911-1938 | 1938-1951 | 1951-1971 | 1971-1981 | 1981-2001 | Fixed effects | GMM |
| Constant | 0.041 | 0.043 | 0.147 | .0131 | 0.188 | 0.048 | 0.0003 | -0.4273 |
| Standard error | 0.026 | 0.037 | 0.050 | 0.014*** | 0.101* | 0.020** | 0.0110 | 0.3407 |
| $B_1$ | -0.004 | -0.007 | -0.032 | -0.011 | -0.028 | -0.006 | 0.0014 | -0.2570 |
| $B_1$ standard error | 0.004 | 0.005 | 0.009*** | 0.003*** | 0.015* | 0.003* | 0.0010 | 0.1658 |
| $B_2$ | 0.006 | 0.011 | 0.097 | 0.000 | 0.091 | 0.026 | 0.0049 | 0.4547 |
| $B_2$ standard error | 0.002*** | 0.005* | 0.031*** | 0.009 | 0.045* | 0.015 | 0.0049 | 0.3643 |
| $B_3$ | -0.003 | 0.008 | 0.017 | 6.79E-005 | 0.001 | 0.002 | 0.0025 | 0.0020 |
| $B_3$ standard error | 0.003 | 0.005 | 0.010 | 0.001 | 0.003 | 0.001** | 0.0019 | 0.0395 |
| $R^2$ | 0.522 | 0.701 | 0.741 | 0.892 | 0.341 | 0.413 | 0.043 | 6.77(1) |
| N | 16 | 16 | 18 | 19 | 19 | 19 | 107 | 104 |

*Notes and source*: see tables 11 and 12. $B_2$ is human capital, $B_3$ social capital.

## 8. Conclusions

The region is among the main stage-sets of economic history, but it is not an easy subject, due to the widespread lack of data and in particular of official value added figures for the period before the Second World War. Bypassing value added estimates can be a possible solution, trying for instance to make the best use of information about sectoral labour force, which in most of the Western countries is available on a regional basis already since the second half of the nineteenth century. The other solution is to estimate regional value added through indirect procedures, based on employment and wage data as well as on a wide array of other available sources, such as production, equipment, or taxation. This paper has chosen the latter approach, but the results have been integrated with information on the labour force.

The estimates here presented offer a long-term pattern of regional inequality in Italy, which is different from those previously available under three main aspects.

First, estimates of regional value added suggest that, at the end of the nineteenth century, the north-south Italian divide was relatively modest: within southern Italy regional disparities were remarkable, but on average this area was not far below the rest of the country. However, this finding is at odds with our information about literacy, life expectancy, transport infrastructures and the credit sector, which instead points towards a clear gap in favour of the north. According to the available data, per worker productivity in agriculture had a remarkable role in determining the south's relatively good ranking in value added; on the contrary, at 1891 the north was already better off in industry and services.

Secondly, the north-south divide formed mostly during the 1911–51 years, the rise in productivity being its major determinant. This finding supports the (not so abundant) literature on regional development for this period: in the north First World War may have helped the industrial triangle to forge ahead, later the demographic, agrarian, anti-migratory, and autarchic policies of the fascist regime may have further hampered the prospects of economic change in the south. Up to the present, however, the interwar period has been relatively neglected by scholars: it probably deserves more attention, given its relevance for the pattern of regional inequality in Italy.

When linked to the 1971 official figures, and here we come to the third acquisition, our estimates for 1951 indicate that the south converged in the 1950s and 1960s, mainly thanks to

productivity. Conversely, it fell back in the last three decades (1971–2001), due to the decreasing share of (official) activity rates. It must be added that instead the center/north-east, which too was highly diversified in the decades following unification, converged towards the north-west throughout the second half of the twentieth century, and particularly in the 1970s. Here the relative increase in activity rates played the major part, whereas relative improvement in industrial productivity was less important.

In short, over the long run the exception to convergence was the *Mezzogiorno*. The evidence that from 1951 to 1971 this area advanced thanks to value added per worker, particularly in the industrial sector, supports the view that massive regional policy, focused on top-down industrial plants, at that time (and for a time) had a positive impact; the other determinant was massive migration, which also may have exerted some (probably minor) role in the liberal age.

## Appendix. Notes on the 1891-1951 value added estimates: sources, methods, and a critical assessment

For industry and services (in 1891, 1911, 1938, and 1951), Felice's methodology is analogous to the one formalized by Geary and Stark.[90] As a first step, national value added is allocated through regional labour force, then – as a second step – the results (VA 1) are refined through estimates of female and children wages (VA 2): to an adult female is given a wage approximately between 40 and 50% of an adult male, to a child (9-15 years old) a wage approximately between 20 and 35%.[91] The labour force is drawn from both the Census of population (CP) and the Census of industry and services (CI), considering the CP's exceeding workers as underemployment or homework (for each sector or sub-sector, each CP's exceeding worker is weighted a half than a CI's worker). As a third step, VA 2 figures are in turn corrected to account for regional productivity differences within the same specific sector or industry, using wages from the Censuses of Industry and Commerce for 1951 and 1938 (highly detailed and to be considered quite reliable),[92] wages from Zamagni[93] for 1911, different sources and some assumptions for those sectors where wages were not available in 1891 and 1911.[94] Estimating productivity proved to be particularly problematic in the cases of 1891 and (partly) 1911, when statistical information was lacking. Thus some hypotheses had to be introduced: for the industrial sectors in 1891, the solution proposed is based on the comparison between Fenoaltea's new textile estimates[95] and his previous ones,[96] which allocated (new) industrial production through regional employment and, within a same specific activity, did not allow for productivity differences across regions: the hypothesis is that in 1891 pro-

[90] 'Examining Ireland'.

[91] But these shares can change according to the years and specific sectors: see Felice, 'Il reddito delle regioni' and 'Il valore aggiunto' for further details.

[92] With the exception of commerce in 1938, for which an alternative dataset has been used. Cfr. Felice, 'Il reddito delle regioni', pp. 11–2 and 29, for further details on the problems with Commerce in the 1938 Census.

[93] *Industrializzazione e squilibri*.

[94] For example for urban public transports, police, cleaning and funeral services, private employees, credits and insurance, construction, where various coeval sources have been employed; see Felice, 'Il valore aggiunto', pp. 116–24.

[95] 'Textile'.

[96] 'Peeking backward'.

ductivity regional differences in each industrial sector scored with productivity regional differences in textiles the same ratio as in 1911; in the case of services the methodology is analogous, yet using credits and insurance for qualified workers and high income services, constructions for most of the unskilled activities.[97] The sectoral breakdown of VA 1 and VA 2 is at the highest level of detail allowed by the census sources and by the new national value added estimates (for industry, 54 sectors in 1891, 81 in 1911; for services, 74 sectors in 1891, 82 in 1911), that of the final estimates, VA 3, is lower in 1891 and 1911 (for industry, 17 sectors in 1891, 16 in 1911; for services, 13 in 1891, 18 in 1911); for 1938 we have approximately four hundred activities for both VA 1 and VA 3, for 1951 about one hundred.

For industry (in 1891 and 1911), the new estimates by Ciccarelli and Fenoaltea cover 64% of national industrial value added in 1911, 44% in 1891. They can be classified in two groups: those which reconstruct regional total 'directly' from local production ('bottom-up'), and those which allocate the national product in proportion to a number of regional indicators, such as workforce, horsepower, wages, etc. ('top-down') – thus similarly to Felice's estimates, but making use also of information on horsepower. The 'bottom-up' methodology is preferable to the 'top-down' one, but of course the former is not always available; the latter is of more reliable, as more the sector and/or the indicator breakdown is detailed. On the whole, the results by Ciccarelli and Fenoaltea stand out as a monumental work, probably with no parallel in any other country. All the available Ciccarelli and Fenoaltea new series (published and unpublished) are here utilized, whereas for the uncovered sectors Felice's figures are maintained: needless to say, the use of these new series significantly reduces the possible distortion coming from the arbitrariness of the productivity estimate methods sketched above.

For agriculture (in 1891, 1911, 1938, and 1951), Federico's estimates refer to gross saleable production, which is reconstructed directly from local data on production and prices whenever available ('bottom-up'), otherwise obtained by reallocating the estimated national series according to the regional production as resulting from official statistics, or from other information ('top-down').[98] The gross saleable production estimated by Federico has been transformed into value added under the hypothesis of three different shares of costs, depending on the agricultural regime prevailing in each Italian region:[99] 9% for intensive production,

[97] See again Felice, 'Il valore aggiunto', for further and full details.

[98] Federico, 'Le nuove stime', pp. 372, 376.

[99] As from Tassinari, *La distribuzione*.

7% for sharecropping, 4% for extensive production; these regional shares have been re-proportioned over the national costs estimated by Federico.

By and large, Federico's figures follow an approach consistent with Fenoaltea's second generation estimates, but not with the Geary and Stark methodology and thus with Felice's approach for services and (part of) industry – since they do not make use of labour force and wages to allocate national production. However, possible problems may regard intersectoral consistency, not diachronic one. Diachronic problems of coherence may arise with the shift from Ciccarelli and Fenoaltea to Felice between 1911 and 1938 (limitedly to part of industry), and then with the shift from Felice to the official figures between 1951 and 1971.

These problems are probably not as serious as to invalidate the overall picture. For 1891 and 1911, a comparison of estimates, from Fenoaltea 2003 (which as mentioned did not allow for regional productivity disparities within each specific sector), through Felice 2005, until the present ones points towards a substantial concordance of results between Ciccarelli and Fenoaltea's approach on the one side, and Felice's one on the other (tables A.1 and A.2). More in particular, after Felice 2005 estimates are improved by incorporating Ciccarelli and Fenaoltea second generation estimates for construction, these tend to 'stabilize', so much so that further refinements, via incorporating all the other second generation estimates by Ciccarelli and Fenoaltea, involve only marginal improvements. In other words, the picture changes significantly when passing from Fenoaltea 2003 to Felice 2005 and also, to a minor degree, when this latter is refined with the new estimates for construction, especially in the case of 1891; however, when finally we move from Felice revised to present estimates, regional differences remain practically the same.

Table A.1. *Comparison of 1891 different estimates*

| | VA per worker in industry | | | | Total VA per worker | | | | Total per capita VA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Fenoa. 2003 | Felice 2005b | Felice rev. (1) | Present ones | Fenoa. 2003[a] | Felice 2005b | Felice rev. (1) | Present ones | Fenoa. 2003[a] | Felice 2005 | Felice rev. (1) | Present ones |
| Piedmont | 1.04 | 1.65 | 1.38 | 1.36 | 0.90 | 0.98 | 0.96 | 0.96 | 1.02 | 1.10 | 1.08 | 1.08 |
| Liguria | 1.14 | 2.46 | 2.19 | 2.02 | 1.23 | 1.50 | 1.46 | 1.45 | 1.22 | 1.49 | 1.45 | 1.44 |
| Lombardy | 0.99 | 1.28 | 1.14 | 1.14 | 1.01 | 1.06 | 1.05 | 1.05 | 1.11 | 1.16 | 1.15 | 1.15 |
| *North-west* | *1.03* | *1.52* | *1.33* | *1.31* | *0.99* | *1.08* | *1.06* | *1.06* | *1.09* | *1.18* | *1.16* | *1.16* |
| Veneto | 1.05 | 1.18 | 1.01 | 1.03 | 0.82 | 0.81 | 0.81 | 0.81 | 0.81 | 0.80 | 0.80 | 0.80 |
| Emilia | 0.98 | 1.20 | 1.08 | 1.08 | 1.06 | 1.10 | 1.08 | 1.08 | 1.04 | 1.08 | 1.06 | 1.06 |
| Tuscany | 1.12 | 1.22 | 1.18 | 1.24 | 1.22 | 1.24 | 1.23 | 1.24 | 1.00 | 1.02 | 1.02 | 1.03 |
| The Marches | 0.87 | 0.68 | 0.66 | 0.73 | 0.83 | 0.80 | 0.79 | 0.81 | 0.89 | 0.86 | 0.86 | 0.88 |
| Umbria | 0.65 | 0.48 | 0.53 | 0.56 | 0.64 | 0.63 | 0.64 | 0.64 | 1.02 | 1.01 | 1.02 | 1.02 |
| Latium | 1.17 | 1.27 | 1.31 | 1.33 | 1.45 | 1.45 | 1.49 | 1.50 | 1.52 | 1.52 | 1.56 | 1.57 |
| *North-east-c.* | *1.01* | *1.11* | *1.02* | *1.05* | *1.00* | *1.01* | *1.01* | *1.02* | *1.00* | *1.01* | *1.00* | *1.01* |
| Abruzzi | 0.80 | 0.17 | 0.32 | 0.40 | 0.68 | 0.60 | 0.62 | 0.62 | 0.71 | 0.63 | 0.65 | 0.66 |
| Campania | 1.05 | 0.89 | 0.93 | 0.93 | 1.02 | 0.99 | 1.00 | 0.99 | 1.00 | 0.97 | 0.97 | 0.97 |
| Apulia | 0.97 | 0.25 | 0.44 | 0.47 | 1.20 | 1.09 | 1.12 | 1.12 | 1.10 | 1.00 | 1.02 | 1.02 |
| Lucania | 1.00 | 0.26 | 0.60 | 0.68 | 0.72 | 0.64 | 0.68 | 0.68 | 0.77 | 0.69 | 0.73 | 0.74 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Calabria | 0.65 | 0.17 | 0.34 | 0.38 | 0.72 | 0.64 | 0.65 | 0.66 | 0.72 | 0.64 | 0.66 | 0.67 |
| Sicily | 1.09 | 0.54 | 0.69 | 0.62 | 1.21 | 1.10 | 1.12 | 1.10 | 1.02 | 0.93 | 0.94 | 0.93 |
| Sardinia | 1.08 | 0.98 | 0.96 | 0.85 | 1.19 | 1.17 | 1.17 | 1.15 | 0.97 | 0.95 | 0.95 | 0.94 |
| *South and islands* | *0.97* | *0.50* | *0.65* | *0.65* | *1.00* | *0.93* | *0.94* | *0.94* | *0.94* | *0.87* | *0.89* | *0.88* |

*Notes*: Felice rev. (1) = Felice 2005 estimates with Ciccarelli and Fenoaltea 2008 for construction.

[a] With Felice 2005 for agriculture and services.

*Sources*: see text.

Table A.2. *Comparison of 1911 different estimates*

| | VA per worker in industry | | | | Total VA per worker | | | | Total per capita VA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Fenoa. 2003 | Felice 2005b | Felice rev. (1) | Present ones | Fenoa. 2003* | Felice 2005b | Felice rev. (1) | Present ones | Fenoa. 2003* | Felice 2005 | Felice rev. (1) | Present ones |
| Piedmont | 1.01 | 1.16 | 1.15 | 1.09 | 0.97 | 1.01 | 1.00 | 0.99 | 1.14 | 1.18 | 1.17 | 1.15 |
| Liguria | 1.18 | 1.48 | 1.51 | 1.50 | 1.41 | 1.49 | 1.50 | 1.50 | 1.44 | 1.53 | 1.54 | 1.54 |
| Lombardy | 1.02 | 1.13 | 1.12 | 1.09 | 1.12 | 1.15 | 1.13 | 1.13 | 1.19 | 1.22 | 1.20 | 1.19 |
| *North-west* | *1.03* | *1.18* | *1.17* | *1.13* | *1.09* | *1.13* | *1.12* | *1.11* | *1.20* | *1.24* | *1.23* | *1.22* |
| Veneto | 1.00 | 0.98 | 1.04 | 1.04 | 0.86 | 0.85 | 0.86 | 0.87 | 0.85 | 0.84 | 0.86 | 0.86 |
| Emilia | 1.04 | 1.04 | 1.03 | 1.04 | 1.05 | 1.05 | 1.05 | 1.05 | 1.08 | 1.08 | 1.08 | 1.08 |
| Tuscany | 0.89 | 0.88 | 0.89 | 0.94 | 0.95 | 0.94 | 0.95 | 0.96 | 0.97 | 0.96 | 0.96 | 0.97 |
| The Marches | 0.87 | 0.78 | 0.79 | 0.80 | 0.79 | 0.77 | 0.77 | 0.78 | 0.82 | 0.81 | 0.81 | 0.81 |
| Umbria | 0.99 | 0.99 | 1.06 | 1.17 | 0.87 | 0.87 | 0.89 | 0.91 | 0.88 | 0.88 | 0.90 | 0.92 |
| Latium | 1.04 | 1.32 | 1.34 | 1.36 | 1.46 | 1.54 | 1.54 | 1.55 | 1.40 | 1.48 | 1.48 | 1.49 |
| *North-east-c.* | *0.96* | *0.98* | *1.00* | *1.03* | *0.98* | *0.98* | *0.99* | *0.99* | *0.99* | *0.99* | *1.00* | *1.00* |
| Abruzzi | 0.89 | 0.74 | 0.74 | 0.75 | 0.67 | 0.66 | 0.66 | 0.66 | 0.68 | 0.67 | 0.68 | 0.68 |
| Campania | 1.05 | 0.90 | 0.87 | 0.90 | 1.00 | 0.97 | 0.96 | 0.97 | 0.97 | 0.94 | 0.94 | 0.94 |
| Apulia | 1.03 | 0.73 | 0.72 | 0.72 | 1.00 | 0.95 | 0.94 | 0.94 | 0.90 | 0.86 | 0.85 | 0.85 |
| Lucania | 0.93 | 0.72 | 0.82 | 0.89 | 0.69 | 0.67 | 0.68 | 0.69 | 0.72 | 0.70 | 0.72 | 0.73 |
| Calabria | 0.67 | 0.49 | 0.50 | 0.50 | 0.70 | 0.67 | 0.67 | 0.67 | 0.73 | 0.70 | 0.70 | 0.70 |
| Sicily | 1.08 | 0.76 | 0.76 | 0.79 | 1.11 | 1.05 | 1.05 | 1.05 | 0.90 | 0.85 | 0.85 | 0.85 |
| Sardinia | 1.09 | 0.82 | 0.89 | 0.93 | 1.14 | 1.09 | 1.11 | 1.11 | 0.93 | 0.90 | 0.91 | 0.92 |
| *South and islands* | *1.00* | *0.77* | *0.76* | *0.79* | *0.95* | *0.91* | *0.91* | *0.91* | *0.87* | *0.84* | *0.84* | *0.84* |

*Notes and sources*: as above.

This finding should comforts us on the hope that, in some future, possible new sectoral estimates are not going to modify the overall pattern in a significant way. It is also a point in favour of the assumptions of the 'Geary and Stark' methodology, analogous to Felice's one, which estimates regional value added through the labour force, revised with wages to account for productivity.[100] In Felice 2005 estimates, in fact, labour force figures for construction were unsound because of the workers' high seasonality; moreover, the 1891 labour force was interpolated between 1881 and 1901 and thus it couldn't trace the construction bubble of the beginning of the 1890s. These faults can explain the remarkable changes introduced for this sector by Ciccarelli and Fenoaltea second generation estimates, in 1891. For the other three benchmarks (1911, but also 1938 and 1951), labour force figures are more reliable and drawn

[100] A further confirmation comes from a recent work by Di Vaio ('Economic growth'), which for industry in 1911 has tested the hypothesis of an elasticity of substitution between capital and labour different from 1 (i.e., different from perfect substitution which is the basic assumption behind Geary and Stark methodology), confirming by and large Felice's results.

on the basis of a highly detailed sub-sectoral breakdown, where both the Census of population and the Census of industry and services are used. Furthermore, high seasonality typically affected construction much more than the rest of industry – and of course it regarded agriculture, where in our case labour force figures are not used to estimate value added.

For 1911, changes are marginal and on the whole unimportant. If we credit Ciccarelli and Fenoaltea's figures, we can conclude that Felice's estimates tend to slightly exaggerate regional differences, but this possible bias appears to be so modest (0.01 per cent in terms of total value added per worker) that it can hardly impact upon the impressive falling back of southern Italy in the interwar years – which is also confirmed by the trend of other basic economic indicators, such as activity rates and, above all, the allocation of regional labour force by sectors. Indeed, such slight changes should be taken as an evidence that the results are by and large solid, and the overall pattern quite reliable.

A mirror-problem arises when we move from 1951 to 1971, switching from Felice's estimates to the official figures, which are based on production data: in industry, the catching-up in per worker productivity is impressive (from 0.64 to 0.89), and it could be partly due to a shift of methods. However, if we look at data on horsepower, we have by and large a confirmation of the estimates based on employment and wages. As we can see from table A.3, the rise in value added per worker between 1951 and 1971 broadly corresponds to the rise in horsepower per worker. The gap between the two measures (HP/L and VA/L) sharply falls at a certain point, but this point is between 1938 and 1951, i.e. it is not related to a shift in methods; in 1971, the relation between the two measures is very similar to the one observed in 1951 which relies upon indirect estimates of value added. All considered, 1951 estimates can still be downward biased for the south (of course, all estimates are always questionable), but the possible bias can hardly change the main results.

Table A.3. *Industry: horsepower/employment and per worker productivity in the* Mezzogiorno*, 1911–71 (Italy=1)*

| | HP/L | | VA/L | |
|---|---|---|---|---|
| | CP | CI | CP | CI |
| 1911 | 0.66 | 0.90 | 0.77 | 1.04 |

| | | | | |
|---|---|---|---|---|
| 1938 | 0.57 | 0.69 | 0.67 | 0.80 |
| 1951 | 0.63 | 0.69 | 0.64 | 0.69 |
| 1971 | 0.87 | 1.20 | 0.89 | 1.23 |

Horsepower is always from the industrial census, the employment is either from the population census (CP) or from the industrial census (CI).

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