PAPER

Title:
Investigating Regional Disparities in Italy's well-being since Unification (1871-2011)

Authors and e-mails of them:
Barbara Ermini - Università Politecnica delle Marche (b.ermini@univpm.it)
Gallegati Mauro - Università Politecnica delle Marche (mauro.gallegati@univpm.it)
Gentili Andrea – Università degli Studi Internazionali di Roma (andrea.gentili@unint.eu)
Francesco Maria Chelli - Università Politecnica delle Marche (f.chelli@univpm.it)

Department:
Department of Social Science and Economics

University:
Università Politecnica delle Marche

Subject area: *(please, indicate the subject area which corresponds to the paper)*
Growth, convergence and regional and urban development

Abstract
This contribution offers a new lecture of the Italian great divide among territories. By means of long- run, multidimensional well-being analysis across Italian regions over 140 years we examine 6 different domains of wellbeing and the regional process of convergence or divergence. Over the period and selected sub-periods, we study both σ- and β- convergence and we shed new light into the North-South divide in Italy. We show that while Economic convergence is far from being reached, much better results were obtained in other relevant wellbeing domains. We also observe that in periods in which there is higher economic growth and economic convergence among regions, the speed of convergence in other domains appears to be enhanced. Finally, despite the relative convergence, the South had never been able to overcome the North and/or the Centre.
Keywords: *Italian economic history; well-being; Adjusted Mazziotta-Pareto Index; Equitable and sustainable wellbeing.*

JEL codes: N93, N94, R11, Q01

1. Introduction

In the last two decades the focus of economic research extended its boundaries to the analysis of the society in a broader sense, trying to address a general question: which is the nexus between economic growth and well-being? Moreover, is economic growth sufficient to ensure sustainable and equitable well-being? According to regional and cross-country convergence analysis, significant differences persist between and within countries not only in per capita GDP (Meliciani and Peracchi, 2006) but also in other relevant spheres of economic and social life, such as health conditions (Iammarino et al., 2019) and literacy levels (Johnson and Papageorgiou, 2020). Following the debate after the *Beyond the GDP* initiative and motivated by the increasing interest both in regional (OECD, 2014) and time (Van Zanden et al., 2014) well-being dimensions, this paper contributes to this growing body of literature by investigating the long-run well-being in the Italian regions (NUTS II level) over 140 years (1871-2011) by adopting a multidimensional approach.

Italy, indeed, represents a great candidate to study both the issues of multidimensional well- being and long-run convergence. On the one hand, the country was unified in 1861 and data collection for a relatively large set of variables at the regional level is considered reliable since the 1871 census, which is a necessary condition to undertake a multidimensional analysis. For instance, Felice (2012) deals with estimates of some aspect of well-being, namely human and social capital, from 1891 to 2011 at the regional level, while Ciommi et al. (2017a) analyse the Italian well-being from 1861 to 2011 at the national level.

On the other hand, Italy is the country in Europe presenting the highest level of economic inequality among territories, being the northern regions competitive with the core of Europe (namely Germany) while the southern regions are in line with Greece (Eurostat, 2019). According to the mainstream literature, a certain degree of convergence was expected given that the Italian regions shared the same institutional set for more than 150 years, enjoyed the same cultural background (religion, language, civil law) and did not present significant differences in natural resources endowment (but water). The work of Felice (2012) investigated this discrepancy by performing a convergence analysis at the regional level on Human Development Index (HDI) and its components. However, a multidimensional approach to wellbeing seems more appropriate to have a clearer development picture (Van Zanden et al., 2014), and

moreover, the heterogeneity of Italy may arise from a multiplicity of factors such as quality of schooling and family background (Brunello and Checchi, 2005), infrastructures (Carlucci et al., 2017; Bonfatti et al., 2021), institution quality (Ferrara and Nisticò, 2019) and trust and social capital (Bigoni et al, 2016).

This study contributes to the literature in several respects. First, it represents the first attempt to analyse converge among Italian regional by conceiving national development as a multidimensional concept of wellbeing in line with the suggestions of the "going beyond GDP" approach. We expand the dimensions of relevant aspects of the quality of life and welfare to be considered for an overall development of a country. Usually, the literature focused on solely HDI's three dimensions (Felice, 2012), if not GDP only (Felice, 2019). On the contrary, this paper focus on six dimensions (: domains) of life: health, education, work, economic well-being, political participation, and environment. These domains have been elaborated by Ciommi et al. (2017a), following Italian Institute of Statistics (hereafter, ISTAT) and National Council of Economy and Labour (hereafter, CNEL) "Equitable and Sustainable Well-being" project (hereafter, BES). This original data base provides a representative composite index for any domain and any region. These indices have been computed through a non- compensatory approach (Adjusted Mazziotta-Pareto Index; hereafter, AMPI; Mazziotta and Pareto, 2018) aimed to summarize the informative content of 22 selected indicators over a long-time span.

Secondly, the convergence analysis is developed over 140 years, starting from 1871 till 2011. We then consider the long run development of Italy a decade after the Unification until recent years for which temporal time series and comparable regional data have been available. To our knowledge, there are no paper adopting such a long-time span for the analysis of growth convergence across Italian regions in so many different aspects of quality of life. Doubtless the work of Vecchi (2017) as well as the contributions of Felice (2013, 2019) provides, among others, a carefully review (from an economic perspective) of the dual route of Italian development; nonetheless the work of Vecchi (2017) is based on a series of single dimension analysis, while Felice (2013, 2019) mainly focus on HDI and structural component of the economy while other dimensions of wellbeing are left aside. In addition, and accordingly with those notable contributions, we consider several main sub-periods to consider the presence of peculiar phases of the Italian economic history.

Thirdly, we add to the literature on the existence of a North-South divide in Italy over time by exploring the extend of the gap along several dimensions of the development, revealing a more articulated picture of the long run growth patterns characterizing these areas in different periods.

Our main results are rooted in providing evidence of long-run regional convergence (β and σ- convergence) for some domains (and divergence for others). Moreover, we show that while regions from the Centre of Italy shows a robust convergence with Northern regions, the South shows significative convergence only with regard a few domains and/or periods. This result is strengthened by the analysis of the relative position of regions in a national ranking. Only in the Education domain we observe a crossover of southern with northern regions, while in the remaining domains, only regions from the Centre improve their ranking eventually overcoming Northern regions. Nonetheless, we show that economic convergence happened only in the post WWII period which is the so called "golden age" of Italian economy, that is the period of strongest national economic growth. While economic convergence seems to be not a necessary condition for convergence in other domains, in periods of sustained economic growth the convergence in all other domains (but environment) was faster; nevertheless, regions of the South were generally not able to climb the rank in wellbeing domains.

The rest of the paper is organized as follow. Section 2 introduces the main literature evidencing the presence of a regional disparity concern and the importance of undertaking growth converge analysis in Italy. Section 3 presents data and methodology, followed by a review of the statistical and econometric techniques used in the context of convergence analysis. In section 4 we present the main findings about the different definition of convergence assumed, also with regard to the spatial pattern of growth over time of different domains. Finally, section 5 provides a discussion of results.

2. The "Questione Meridionale"

The issue of convergence among regions moves its first steps with the seminal work of Williamson (1965) who, extending the Kuznets curve idea, proposed an inverted U-shaped relation between per capita value-added and regional inequality. According to this view, while industrialization takes over, territorial inequality within and between

countries increases, while it decreases as industrialization spreads.[1]1 The neoclassical theory supports this "natural" convergence path since Solow (1956) and Swan (1956) models. The diminishing return to scale hypothesis *de facto* implies that output, and therefore income, grows faster in regions with a lower endowment of capital. In richer territories, adding one unit of capital stock implies a lower return than in poorer territories, because of lower productivity. Thus, territories must converge in the long run; if industrial takeover does not happen, it is only due to lack of capital that can be provided through loans. Evidence shows that loans and/or public interventions, bringing capital where not available, produced considerably positive results only in specific areas and countries whereas in many others, among which Italy, it did not work (Felice, 2011). To realize economic convergence as proposed in Solow and Swan models, in fact, not only the diminishing return to scale hypothesis must be satisfied, but territories must also have the same technology, propensity to save and population growth. These conditions are doubtless too strict to be fulfilled by different countries.

Moreover, as largely debated in economic literature, the concept of technology is not confined to the production techniques field, which however were particularly different and difficult to spread among counties and territories in the 19th century (Baldwin, 2019), but it must be intended in a broader sense. It embraces different branches of the national and local organization as institutions (Acemoglu, 2005), education (Frank, 1960), justice enforcement (Haggard and Tiede, 2011), taxation (Sorens, 2014), infrastructures (Crescenzi and Rodríguez-Pose, 2012) and land property rights (Besley and Ghatak, 2010). It follows that at the cross-country level, there is no support to the idea that technology may be the same among countries, but we may expect that within countries these fundamentals tend to converge at least in the medium- and long run.

It is doubtless that, at the time of unification, countries like Italy and Germany, which for centuries were fractioned in several local reigns and independent states, may have faced different technological conditions within the newly unified borders. Education levels, GDP per capita, urbanization and (land) property laws were particularly different in the pre-unification states in Italy. Nonetheless, common sense suggests that a

[1] Lutz (1962) and Fuà (1978) propose well-founded alternative explanations for the Italian Dualism based on economic structure and labour migration; Lutz (1962) focused particularly on the economic dualism and on labour migration arguing that South-North migration would have relieved population pressure and therefore raised individual agricultural income making the south attractive also for industrialization.

country[2] should overcome several of these differences over more than 150 years. This, indeed, should be mirrored in the expected long-run convergence proposed by Williamson (1965).

Notwithstanding the unification occurred in 1861 (completed in 1871 - see Figure 1) and the approval of several national laws on education, a land property reform, the adoption of pre-and post-war national infrastructural plan, and the massive national intervention (after WWII) in the economy of the southern part of the country with the purpose of evening the system among territories, Italy is doubtless the most economically unequal country in Europe. The *Questione Meridionale* (the problem of the South – QM henceforth) was largely debated since Antonio Billia in 1873 named this way the dramatic economic backwardness of the South of the recently formed Reign of Italy. Several possible explanations had been raised in a century since Nitti and Gramsci charged the northern part of the country of being exploiting the southern as colonist countries did to overseas territories. While this vision cyclically finds relevant supporters both in academy and politics, it seems not supported by data (Felice, 2013).

Figure 1. Italian regions – 1871 – 1921 – 2011. Source: shapefiles from ISTAT[3]. In red the North, in white the Centre and green the South.

Scholars (Fenoaltea, 2003; Missaia, 2019; Di Martino et al., 2020) focused their attention on the role of natural resources endowment. The South was far from central

[2] In this paper we make use of the term countries to identify unified territories under a unique government sharing common language, laws, and historical background. With this definition we avoid the complexity and potentially misleading etymological debate of the difference between country, state, and nation.
[3] Istat: https://www.istat.it/it/archivio/231601 ; credits to Marco Montanari for the graphical representation.

and northern European markets and poor in water endowment, while industrialization in the 19th century required important water supplies. However, the North-Western part of the country, where the take-off started earlier, does not seem to be the perfect place for fast industrialization. Urbanization, which is considered a pre-condition to growth in agglomeration theories, was not higher than in the South and well below those of the UK and France. Notwithstanding water, there is no natural endowment of coal and iron which were the core of the second industrial revolution. Transportation costs, being the access to the seaside and more advanced neighbour countries limited by mountains, not lower than in the South. Moreover, in the last 150 years, dominant technologies changed several times and doubtless water availability, even though still important in some production, is not a key resource in dominant production nowadays.

A third important line of thought trying to explain the *QM* identifies in the pre-condition to unification the main candidate to southern backwardness (Ekaus, 1961). On the one hand, there is no evidence of such dramatic economic backwardness of the South as estimated by Daniele and Malanima (2011) on regional GDP and Ciccarelli and Fenoaltea (2013) on provincial industrial value- added. However, authors' results may be due to the complexity in dealing with poor quality data in favour of the South, in particular concerning agriculture which corresponds to more than 70% of the GDP at unification. Nonetheless, historical evidence supports the idea that the South, on average, was relatively worse off. Indeed, some territories (the provinces of Naples and Palermo among others) were in line with those of the North and, often, better off than those of the Centre by which they were overtaken in few decades. Fuà (1978), however, points out that it was not the industrial development itself to be the major candidate for the Italian dualism, rather the number of industries that were too small to be able to enhance growth. The small dimension of enterprises is known to be even nowadays a constrain to Italian economic growth, by limiting R&D investments (Cusmano et al., 2009).

However, as pointed out by Felice (2013), more than to the economic conditions at unification in quantitative terms (which may be misleading) we should look at the socioeconomic pre-conditions left by Bourbonic Reign. The South was dramatically late in education and human capital accumulation (A'Hearn et al., 2011)[4] due to the failure

[4] See Gentili (2021) for a broad history of Italian education system.

of Bourbons in modernizing the country. The riots against grain taxation made them unable to structure an adequate army and to provide public education and a law enforcement system[5]. After the unification, this lack of institutions took generations to be solved[6] by the newly formed Reign of Italy also because of the parasitical behaviour of southern elites, which were rent-seekers, more than profit-seekers (Felice, 2013). As for education and human capital, health conditions in the South were worse than those in the North with shorter life expectancy and higher infant mortality (Atella et al., 2011). However, while economic convergence seems far from being reached, over one and a half-century, backwardness in education and life expectancy decreased (Felice and Vasta, 2015). Thus, the unification of Italy, while unable to overcome economic inequality among territories, seems to have been able to provide a convergence in two out of three components of the HDI and to the whole index (Felice, 2012).

This perspective is the key issue driving this paper. As Robert Kennedy said: "GDP measures everything except that which makes life worthwhile". Extending the concept to economical and statistical measurements, quality of life, therefore population well-being, needs a multidimensional perspective that cannot be captured only from GDP or income measures (Stiglitz, Sen and Fitoussi, 2009). Even HDI, proposed in 1990 by Mahbub ul Haq, which was a major improvement in development studies, is not sufficient to evaluate wellbeing (Van Zanden et al., 2014). Both GDP and HDI, for example, ignore the environmental disruption which is proved to be harmful both for the well-being of present and future generations and for the long-run sustainability of economic growth. More in general, while focusing on GDP and GDP derived measures, whatever has no market price is not captured. Besides, GDP has been proved to be scarcely able to capture improvement in quality of goods and services. The price in real terms of a present-day television is not that different from the one of television of the 1980s, however, the utility it may generate is doubtless larger; the market price of one year more of life expectancy is even more controversial to be computed, differing according to the age and the health condition of individuals (de facto making the willingness to pay a poor approach). Moreover, GDP completely forgets about distributional issues, and the contribution to the well-being of security, freedom, and

[5] This led to the need for local security which later become Mafia while the story of other crime organizations like Camorra and Ndrangheta (from Campania and Calabria) are more recent and related to other mechanisms

[6] It may be even argued that it was never fully solved.

democracy. “The measurement of well-being is not a purely technical problem, but rather it reflects the values and preferences of a society and its citizens” (Ciommi et al., 2017a, p. 475).

Nonetheless, going beyond GDP implies overcoming market prices logic. In doing this, two major approaches had been identified. On the one hand, the use of a dashboard of indicators, as the Better Life Index of OECD, is largely informative and provide a detailed picture, but it lacks parsimoniousness making regional and cross-country comparison complex (Durand, 2015). On the other hand, a more parsimonious way to represent the information is through composite indicators. To this aim, a large body of literature was developed particularly focused on the aggregation and weighting method (see among others OECD, 2008 and Terzi et al., 2021). Each method, in fact, as well as the choice of underlying variables, may affect results. Although the variety of measures and underlying potential variables is still heavily debated in the literature, less attention was devoted to the convergence path of well-being (Morrison, 2014). However, as pointed out, nothing is ensuring economic convergence in presence of different technologies, therefore we may expect that at least some domains of well-being may be not correlated to economic growth or, eventually, that economic convergence is not observed while well-being is.

From the Italian perspective it may be that while failing in economic convergence, unified Italy had been able to provide convergence over some domain of wellbeing which is at least important as income like health, education, labour conditions, freedom?

3. Data and Methodology

3.1 Data and AMPI

The data used in this study come from a survey work on historical data first implemented at the national level by Ciommi et al. (2017a) and then extended at a regional scale as illustrated in Chelli et al. (2018). To analyse the convergence among Italian regions since unification we adopt a multidimensional well-being approach on 22 indicators that are grouped into six domains of well-being: health, labour, education, economic well-being, political participation, and environment[7]

[7] The data set reflects data availability from official sources and most recognized works of literature, at regional level and over time. For more details and methodological issues see Chelli et al., 2018 and, more in general for the choice of domains, Ciommi et al., 2017a.

Table 1: Indicators and domains of Italian well-being. Source: authors' computations.

(1)	(2)	(3)	(4)	(5)	(6)
Wellbeing Domain	**AMPI 1871**	**AMPI Year Max**	**Indicators**	1871	2011
Economic wellbeing	56.26 1.87	2001	GDP pc at 2011 prices[1] in Euro	1990.94 406.30	25432.00 6098.07
			GDP pc Agricolture at 2011 prices[1] in Euro	4901.55 1026.68	29457.21 6613.59
			GDP pc Industry at 2011 prices[1] in Euro	7781.83 4498.15	58090.12 7484.95
			GDP pc Services at 2011 prices[1] in Euro	8708.16 3080.40	67398.24 4883.85
Labour	69.98 3.83	2011	Child labour share[2,*] males %	85.711 12.70	0.00[#] .
			Child labour share[2,*] females %	49.53 17.90	0.00[#] .
			Activity rate[3] %	70.08 6.91	50.84 3.81
			GDP per worker, 1871-2011 euro at 2011 prices[1] in Euro	6133.94 1068.61	62894.14 6289.83
			Workers on active population[1] %	44.94 3.31	39.96 6.60
			Employment rate in Industry[1] %	18.10 3.96	24.91 5.84
			Employment rate in Services[1] %	25.20 6.24	68.73 5.58
Health	50.20 2.82	2001	Average height of compulsory military service[2,**] cm.	162.73 1.73	174.87 1.65
			Expected life at birth[2] years	32.70 2.63	81.72 0.53
			Infant mortality[2] ‰	225.52 17.60	3.55 0.90
Education	55.80 7.59	2011	Literacy rate (15+ population) [2] %	27.27 14.28	98.30 1.41
			Enrolment rate primary school 6 -10 yearsold[2] %	52.41 23.85	101.33^ 1.55
			Expected years of schooling, 1871-2007[4] years	1.60 0.70	16.41 1.20
Political Participation	n.d.	n.d.	Voter turnout (closer year to the census) [5]	58606.17 119704.40	4551286 1.01e+07
			Voter participation (closer year to the census) [5] %	52.21 10.10	79.86 4.23
			First-second party distance (closer year to the census) [5] %	9.87 34.78	3.44 11.28
Environment	99.51 0.08	1871	CO2 emissions[5] ktons Carbon	0.03 0.01	2.12 0.21
			Overbuilding[6] m per unit of total regional area	18.19631 72.78591	3862.98 16635.96

[1] Sources: Felice (2019), [2] Vecchi (2011), [3] ISTAT (2018), [4] Felice & Vasta (2015), [5] Corbetta & Piretti (2009) and MinInt (2019) for 2011, [5] authors computations from Van Zanden et al. (2014), [6] authors computations from Baffigi (2011) – for computation methodology see Ciommi et al. (2017b).

*Number of 10–14 years old working children on the total population 10-14 years old.

** Values span from 1855–1980 then we used data from the National Health System (see Chelli et al., 2018 for details).

[#] The official value is 0 for each region.

^ The value larger than 100 is due to immigration of non-registered children and to students repeating the year.

This large data availability was allowed by the effort of ISTAT, Bank of Italy and researchers following the 150th anniversary of Italian unification (Baffigi, 2011). This work mainly relies on the contribution of Vecchi (2011), Corbetta and Piretti (2009) and Felice (2011). Reliable regional data in Italy are available since 1871, generally at

census years therefore our time sample is based on decades. Table 1 reports, in columns 1 and 4-6, descriptive statistics of the selected indicators for each domain both at the initial and final year of analysis.

As pointed out, several efforts have been devoted to statistically summarize a multidimensional framework into a single metric that makes it easier to compute the progress/decline in domains or global well-being over time and space. In this work, to allow comparison with previous literature on the topic, normalization, and aggregation of the individual indicators into a composite index have been conducted through the AMPI methodology. Beyond being internationally recognized among aggregation methods (Casadio Tarabusi and Guarini, 2013; Greco et al., 2019), it is widely adopted in the context of Italian BES (Istat, 2015; Mazziotta and Pareto, 2016; Ciommi et al., 2017b; Bacchini et al., 2020).

Following Mazziotta and Pareto (2014, p. 129), to compute the AMPI index given a matrix of variables $X = [x_{ij}]$ first compute the matrix $R = [r_{ij}]$ such that:

$$r_{ij} = \frac{\left(x_{ij} - Min_{x_j}\right)}{\left(Max_{x_j} - Min_{x_j}\right)} 60 + 70 \quad (1)$$

where Max_{x_j} and Min_{x_j} are the so-called "goalpost" for indicator j and x_{ij} is the value of unit i of the indicator j. To provide an easier interpretation we settled the goalposts such that the indicator takes the value of 100 for Italy in 2011. This seemed to be the natural choice since it is the last year for which census information is available and GDP related variables are all discounted at 2011 prices[8]. In the case the indicator *j* negatively contributes to the wellbeing (i.e., instead of increasing the wellbeing it reduces it as for CO^2 emission to environmental domain), the r_{ij} takes the value of the complement to 200 of (1).

Defining M_{r_i} and S_{r_i} the mean and the standard deviation of r_{ij}, AMPI takes the form:

$$AMPI_i^{+/-} = M_{r_i} \pm S_{r_i} cv_i \quad (2)$$

[8] See Mazzotta and Pareto (2014, p. 129) on how to settle properly Goalpost.

where $\boxed{cv_i = S_{r_i}/M_{r_i}}$; the sign depends on the kind of the phenomenon (see De Muro et al., 2011).

Considering our data context, Table 1 includes the computed 1871 mean and standard deviation of AMPI for each domain. We also report the value of the index at unification and the year it reached its maximum value for Italy. Figure 2 plots the AMPI value over time for each domain in each region in Italy. Regions are reported in geographical order, that is, the first line (Valle d'Aosta to Liguria) conveys regions' plot from the North-East of the country, the second line from the North-East, the third line from the Centre, the remaining are the South, and the Islands. To improve the readability of the graph we included a line corresponding to the value of 100 that is the value for Italy in 2011 for every domain[9].

Political participation is not presented for methodological and theoretical motivations. While voter turnout is unquestionably positive being a measure of democratic openness, both political participation and distance among the first and second parties, which should capture the participation, competition, and contestability of results in voting, are controversial in their contribution to wellbeing. By way of example, during fascism, participation was compulsory therefore it is not suitable for capturing voluntary participation and contestability, while the distance between the first and second party is likely to capture the (negative) dictatorship effect. On the contrary, a very high distance between the first and second parties may signal the tutelage of minorities in several regions by local parties which are generally considered a positive factor in democratic studies.

[9] AMPI generally fluctuates between 70 to 130, however in literature (see, among others, Alaimo and Maggino, 2020), as in this paper, there are several examples showing that when dealing with regional data over time the results may fall outside those boundaries. This is the case for Environment in this paper. By setting environment in Italy equal to 100 in 2011, it caused the average value in 1871 to fluctuate around the value of 300. For sake of representation in Graph 1 values for environment are divided by 3 to fit the same scale being of interest the regional dynamic and not the absolute value of the indicator.

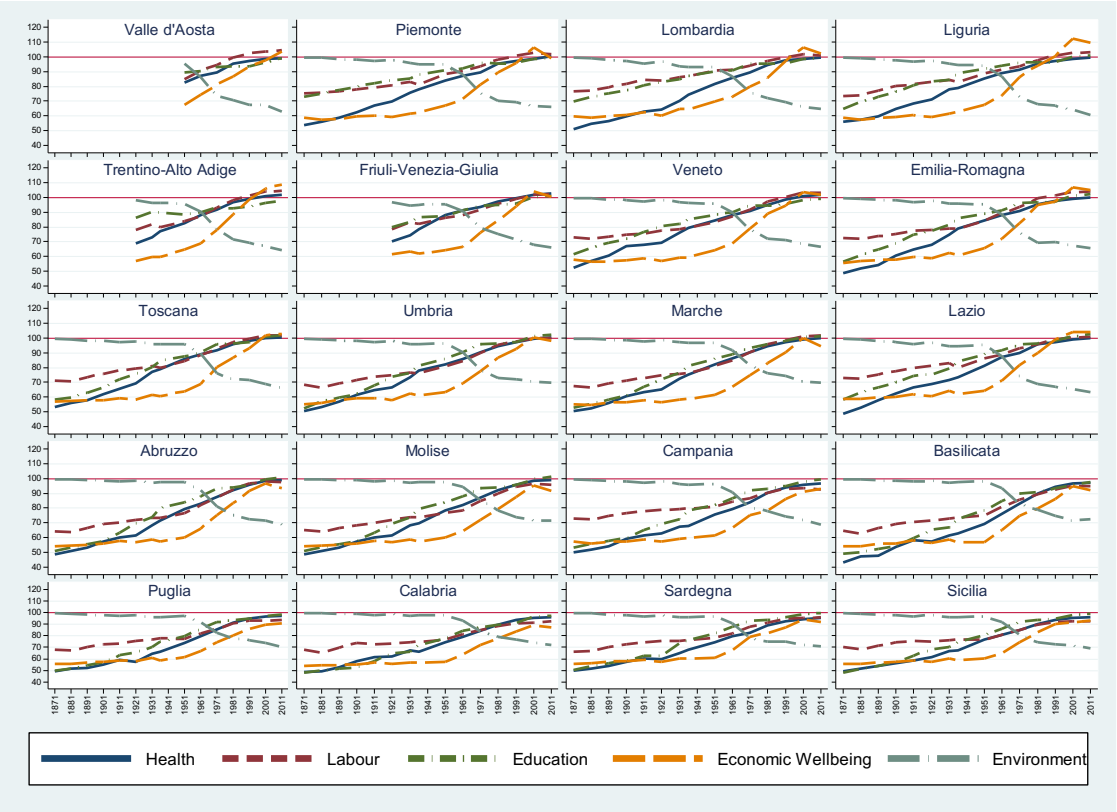

Figure 1: Wellbeing AMPI Indices distribution in Italian regions 1871-2011. Red line stands for Italy mean value in 2011.

Source: authors' computations.

By looking at Figure 2, four main dynamics may be traced to depict the regional development of wellbeing in Italy. First, every domain (but the environment) shows continuous growth since unification, almost doubling its value in each region. Thus, Italians have ameliorated the quality of almost every aspect of their life. Second, the environment shows a dramatic fall after WWII in the so-called golden age of the Italian economy, while showing a slowdown of this worsening trend with the coming of the new millennium and the 2007 crisis. The pattern evidenced by this domain is almost specular to the GDPpc growth dynamic. Third, all domains (but the environment) reach a peak in the years 2001 or 2011. Finally, while Northern regions all overcome the Italian average in 2011, Southern regions are all below it in almost every domain.

Nonetheless, while dealing with composite indicators like the AMPIs, more than the absolute level it is dynamic over time which matters. Specifically, while convergence analysis has been generally used to (dis-)validate neoclassical models in the exogenous vs endogenous growth theories debate, the issue of progress of multiple aspects of life is

far more interesting and complex than the mere per-capita income development analysis. As pointed out in Konya and Guisan (2008, p. 22) "For developing countries [as post-unification Italy, A.N.] once they manage to escape from the strangler grip of famine, other dimensions of human life, like health, education, working conditions […] become increasingly important". To catch up with richer countries (or territories) is not simply a matter of reaching a higher income, but, more importantly, to reach (possibly) the same level of wellbeing and to adhere to regional cohesion. In the remainder of the paper, we focus on absolute convergence. Without loss of generality and without neglecting the importance of conditional convergence, we are interested in understanding if Italian lagging regions had been able to catch up with those relatively better off in some domains. Moreover, as already pointed out, technology, institutions, public goods, access to foreign markets and so on, thus whatever conditionality is generally tested on, should be the same in the long run in a unified country.

3.2 Convergence Analysis

Accordingly with neo-classical convergence theory of economic growth (Barro, 1991; Barro and Sala-i-Martin, 1992, 1995), this paper analyses convergence among Italian regions by adopting the two most used concepts in this strand of literature: β- and σ-convergence (Durlauf and Quah, 1999; Monfort, 2008). The notion of β-convergence is rooted in the idea of "catching up" among countries or regions wherein all economies, over time, physiologically tend towards a uniform steady-state where differences in per capita income progressively flatten. A corollary of this expectation is that, during the transition phase, regions with lower per capita income must grow with higher average rates than richer regions. Thus, income disparities disappear and the catching up process takes place with economies that eventually converge to the same steady state. Within this approach, the β-convergence coefficient represents the speed of undeveloped regions to catch up with that of the developed region (Yang et al., 2016). Instead, measuring the so-called σ-convergence implies examining the level of dispersion of per capita income in each sample in the long run. If the degree of dispersion decreases over time, the hypothesis of σ-convergence takes place signalling that the economies that deviate from the mean are converging to the steady-state. The two phenomena are interdependent: the β-convergence is a necessary but not sufficient condition for σ-convergence (Barro and Sala-i- Martin, 1995).

Usually, the concepts of β-convergence and σ-convergence are applied to the GDP per capita growth analysis while in this paper we examine domains of the Italian BES. This empirical strategy is borrowed from those studies aimed at evaluating converge of composite indexes of development, firstly Human Development Index (Mazumdar, 2002; Sutcliff, 2004; Noorbakhsh, 2007; Konya and Guisan, 2008; Mayer-Foulkes, 2012; Felice and Vasta, 2015; Yang et al., 2016). Accordingly, we evaluate the process toward convergence (or divergence) of the Italian regions in different aspects of development. A common approach to measure β-convergence, following the pioneering works of Mankiw et al. (1992) and Barro and Sala-i-Martin (2002), is:

$$\frac{1}{T}\ln\frac{AMPI_{i,t+T}^{j}}{AMPI_{i,t}^{j}} = \alpha^{j} + \beta^{j}\ln\left(AMPI_{i,t}^{j}\right) + u_{i}^{j} \tag{1}$$

where $AMPI_{i,t}^{j}$ is the BES domain index - with j= health, labour, education, economic well-being, political participation, and environment - of the i-th Italian region. The dependent variable $\frac{1}{T}\ln\frac{AMPI_{i,t+T}^{j}}{AMPI_{i,t}^{j}}$ is the annualized growth rate $AMPI_{i,t}^{j}$ of the i-th region between periods t and t + T, respectively the initial and final year, respectively 1871 and 2011, examined in the convergence analysis. A negative value of β reflects convergence while the opposite corresponds to divergence; a value $\beta = 0$ implies the absence of convergence. The nearer the value of β to –1, the higher the speed of convergence. When a statistically significant convergence β^{j} was detected, it is possible to compute the rate of speed of convergence λ^{j} (Dapena et al., 2014):

$$\lambda^{j} = \frac{-\ln\left(1+\beta^{j}\right)}{T}100 \tag{2}$$

with T the number of years considered to compute convergence and j denoting the BES domain. In addition, the so-called half-life period, that is the time necessary for

disparities to decrease by 50%, is derived as (Konya and Guisan, 2008; Butkus et al., 2018):

$$HL^j = \frac{-\ln(2)}{\ln(1+\beta^j)} \tag{3}$$

In this paper, the β-convergence hypothesis is tested over the period 1871-2011 and the estimation is made via OLS. We run OLS regressions also for sub-periods corresponding to peculiar phases of the Italian economic history.

While β-convergence focuses on detecting possible catching-up processes, σ-convergence refers to a reduction of disparities among regions in time (Monfort, 2008). It quantifies the dispersion within the cross-section distribution of the variable of interest in different moments as time goes by. If the standard deviation and dispersion of the BES domain indicator of different regions decrease over time, it is a signal for convergence. The most frequently adopted statistical indicators of σ-convergence are the standard deviation σ_t^j and the coefficient of variation $CV^j = \frac{\sigma_t^j}{\bar{y}^j}$ of the variable of interest (Noorbakhsh, 2007; Konya and Guisan, 2008; Monfort, 2008; Yang et al., 2016)10. Convergence holds if ($\sigma_{t+T}^j < \sigma_t^j$) or ($CV_{t+T}^j < CV_t^j$)

4. Results

4.1 σ- Convergence Analysis

Results of the σ-convergence analysis are displayed in Figure 3. It reports the pattern of the standard deviation (SD) and the coefficient of variation (CV) over time of each well-being indicator. Following Konya and Guisan (2008), this graphical analysis is accompanied by OLS trend regressions of the standard deviation and the coefficient of variation, which assess the entity and sign of the variability over time, which is reported in Table 2.

[10] The coefficient of variation is usually preferred in convergence analysis as it is not affected by measurement unit nor on the indicators' size (Dalgaard and Vastrup, 2001; Monfort, 2008; Bucur and Stangaciu, 2015).

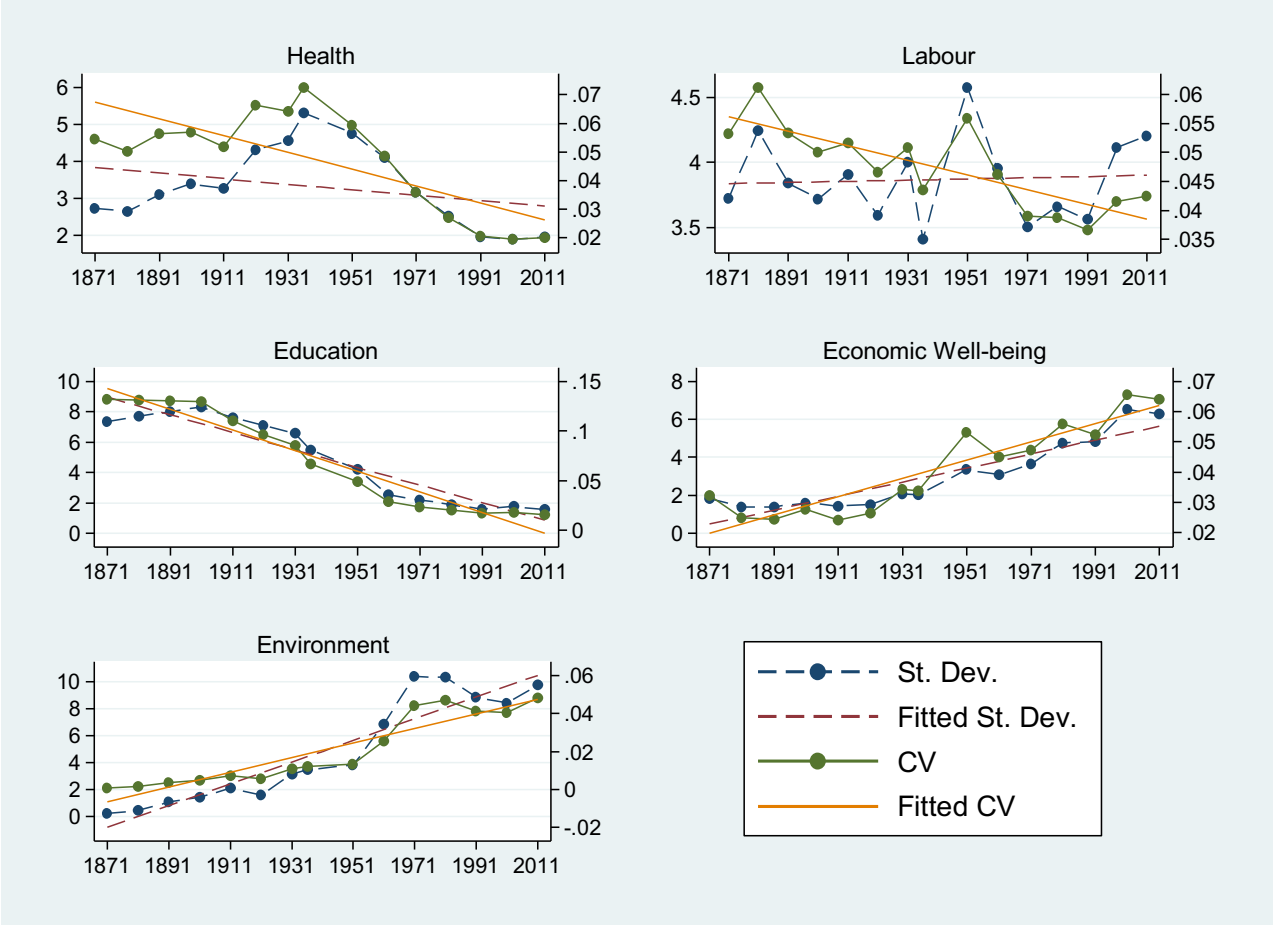

Figure 2: Italian region σ-convergence of well-being indicators. Standard Deviation (St. Dev.) and Coefficient of Variation (CV) over 1871-2011.

Source: authors' computations.

It emerges a very differentiated pattern of convergence among the examined domains of well-being. Graphically, it can be detected a clear σ-converge concerning the Education where both the standard deviation and the coefficient of variation steadily converged over time, with min-max values ranging from about 8.00 for σ^W and 0.13 for CV^W in 1971 to $\sigma^W = 1.50$ and $CV^W =$0.02 in 2011. These trends of convergence over time are statistically significant in the OLS trend analysis, as shown in Table 2.

Less straightforward is the dynamics of the above indicators in the case of Health which, eventually, presents a converging evolution path from the post-war period till recent years, especially if the CV^H index is considered. Considering the entire period, only the linear time trend of CV^H has a significant negative slope. On the opposite, the Wealth and, more markedly, the Environment domain is characterized by an increasing pattern of each indicator of standard deviation

($\sigma^W_{2011} \equiv 6.28 > \sigma^W_{1871} \equiv 1.82;\ \sigma^N_{2011} \equiv 9.78 > \sigma^N_{1871} \equiv 0.23$) and coefficient of variation ($CV^W_{2011} \equiv 0.64 > CV^W_{1871} \equiv 0.03;\ CV^N_{2011} \equiv 0.05 < CV^N_{1871} \equiv 0.00$) revealing that growth divergence is at work and disparities remain among regions.

The territorial dispersion of indicators is confirmed also by the results of the OLS time trend regressions of SD and CV of both well-being domains. Finally, the two indicators of σ-convergence present a puzzling pattern when we focus on the labour domain. While the standard deviation exhibits a swinging path with a slightly increasing drift, the opposite occurs in the case of CV pointing to confirm the presence of σ-converge in the realm of labour, as also stated by the results of the estimated OLS fit of overall CV^H.

To sum up, the high heterogeneity in the dispersion pattern of SD and CV across the various domains supports the importance of examining territorial growth and evolution of territorial disparities by adopting a multidimensional approach. Moreover, identified trends sustain the idea that the regional development, in Italy, followed an uneven path with some territories growing while others continued to lag (with possible consequences at the aggregate level).

*Table 2: OLS time trend regressions of SD and CV. Standard errors in parentheses. Legend: *** p<0.01, ** p<0.05, * p<0.1. Source: authors' computations.*

	Health	Labour	Education	Economic Wellbeing	Environment
Standard Deviation (SD)					
year	-0.0074	0.0005	-0.0578***	0.0369***	0.0806***
	(0.006)	(0.002)	(0.006)	(0.004)	(0.009)
Constant	17.6181	2.9865	117.1441***	-68.4813***	-151.6810***
	(12.377)	(3.870)	(10.818)	(8.447)	(16.538)
Observations	15	15	15	15	15
R^2	0.093	0.004	0.892	0.847	0.873
Coefficient of Variation (CV)					
year	-0.0003***	-0.0001***	-0.0010***	0.0003***	0.0004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.6207***	0.2933***	2.0998***	-0.5449***	-0.7267
	(0.145)	(0.052)	(0.145)	(0.072)	(0.080)
Observations	15	15	15	15	15
R^2	0.545	0.633	0.938	0.834	0.872

4.2 β - Convergence Analysis

The presence of β-convergence is assessed by the cross-sectional OLS estimates of absolute converge, reported in Table 3, for the Italian regions. As illustrated in equation

1, the dependent variable of the model is the growth rate of the assumed well-being domain which is regressed on its initial value (measured in natural logarithms). This model is estimated for the entire period 1871-2011 and the sub-periods 1871-1911, 1911-1951, 1951-1971 and 1971-2011. Results are consistent with the previous evidence on the dynamic of regional well-being domains' dispersion over the period 1871-2011.

Table 3. Well-being domains growth and β-convergence of Italian Regions. Source: author's computations.*

Cross-section linear regression: mean growth rate over the period					
	1871-2011	1871-1911	1911-1951	1951-1971	1971-2011
			Health		
beta-converg	-0.006***	-0.008**	0.000	-0.021***	-0.012***
t	(-17.30)	(-3.05)	-0.050	(-8.37)	(-8.72)
constant	0.000	0.000	0.000	0.000	0.000
	(-0.82)	(-0.04)	-1.290	(-0.16)	-0.080
R^2	0.889	0.202	0.000	0.859	0.853
F-statistic	299.32***	9.31**	0.000	70.13***	76.05***
T-converg	52.469	69.094	n.a.	25.616	42.055
			Labour		
beta-converg	-0.004***	-0.003	0.001	-0.017***	0.000
	(-5.17)	(-1.10)	-0.350	(-6.02)	-0.090
constant	0.000	0.000	0.000	0.000	0.000
	(-0.91)	-0.010	(-1.04)	0.070	(-0.04)
R^2	0.461	0.084	0.003	0.635	0.001
F-statistic	26.73***	1.220	0.120	36.18***	0.010
T-converg	99.143	252.479	n.a.	32.951	n.a.
			Education		
beta-converg	-0.007***	-0.004*	-0.014***	-0.029***	-0.013***
	(-31.53)	(-2.18)	(-16.32)	(-8.31)	(-6.67)
constant	0.000	0.000	0.000	0.000	0.000
	(-0.37)	-0.080	(-1.10)	0.070	(0,00)
R^2	0.983	0.286	0.934	0.848	0.552
F-statistic	994.22***	4.76*	266.26***	68.98***	44.45***
T-converg	26.189	146.991	36.189	16.350	39.612
			Economic Wellbeing		
beta-converg	0.003	-0.009**	0.022*	-0.015*	0.003
	(-1.43)	(-3.33)	-2.660	(-2.06)	-1.260
constant	0.000	0.000	0.000	0.000	0.000
	(-1.12)	0.010	-1.060	-0.020	-0.090
R^2	0.083	0.467	0.357	0.238	0.029
F-statistic	2.060	11.10**	7.09*	4.23*	1.580
T-converg	n.a.	62.101	n.a.	40.101	n.a.
			Environment		
beta-converg	0.326***	0.181***	0.013*	0.085*	-0.001
	(-5.57)	-6.130	-1.930	-2.690	(-0.23)

constant	0.000	0.000	0.000	0.000	0.000
	(-0.9)	-0.030	0.470	(-0.12)	-0.040
R^2	0.572	0.715	0.170	0.443	0.002
F-statistic	31.02***	37.61***	3.74*	7.25*	0.050
T-converg	n.a.	n.a.	n.a.	n.a.	1316.459

Notes: *Number of regions (observation) increased from 17 to 20 in 1950 by territorial reform. n.a. stands for divergent trends.

Regions appear to diminish disparities in Health over all the time spans considered, except for the post I war period until 1951. In this case, the β coefficient signals an almost meaningless inequalities' resumption which is not statistically significant. According to the estimates obtained for the more recent period, convergence would halve in about 42 years.

Globally convergent is also the growth pattern exhibited by the Education index given that the β-coefficient is negative and significant in any sub-period examined. Its value denotes those disparities are shrinking at a noticeable intensity after 1951 even if the β-coefficient is slightly declining in the more recent decades. Focusing on the sub-period 1971-2011 can be computed a half-life period value of about four decades.

As already evidenced by the investigation of σ-convergence, the index of Environment displays a diverging path of development that eventually reverts, but losing statistical significance, during the period 1971-2011.

In the Economic Wellbeing domain, it emerges that the apparent increase of inequalities of growth process from 1871 to 2011 does not hinge on robust estimates as the β coefficient does not reach conventional levels of statistical significance. The evolving trend is not uniform. In the two sub-periods 1871-1911 and, more sharply, 1951-1971 regions shorten their gap (with a convergence period of about 60 and 40 years, respectively, for backward regions to make up for half of the lag). On the contrary, divergence severely marks the dynamic of the Economic Wellbeing index growth during 1911-1951.

Finally, the global converging dynamic that characterizes the evolution of the Labour domain over the entire period reflected by a negative and statistically significant β-coefficient is the result of swinging patterns of convergence and divergence over sub-periods. Though, the only statistically robust β-coefficient is estimated for the converging phase of development that took place during 1951-1971 which is denoted by a half-time value of about 33 years.

4.3 Macro Areas convergence and growth dynamics

Concerning the possibility that the dynamics of Italian regions' growth was characterized by spatial peculiarities in terms of differentiated patterns between macro geographical areas, we re-run the basic growth model of each well-being domain by including spatial intercepts and slope dummies denoting regions belonging to North, Centre and South (including Isles of Sicily and Sardinia)11. This analysis provides insight into the well-known North-South divide in Italy as it allows to better investigate the growth pattern of each domain in relation to the starting conditions in each macro area and to examine the relative converging pattern among areas at different stage of development. In Table 4 we report the marginal effects (at mean) of any geographical area in the convergence process which represents the relationship between the expected average growth rate and the initial level of the AMPI of any well-being domain observed in the North, Centre, and South of Italy. Moreover, as reported in Figure 4 we computed the rank of each region to show the crossover patterns. As shown in relative deprivation analysis (Stark and Taylor, 1989), it is not only the absolute value that matters in human beings, but the positioning in the distribution. This supports the idea that it is not only a matter of levels but also the possibility to reach and/or overcome the relevant counterparts that play a role in individual wellbeing.

Table 4: Macro areas convergence, conditional marginal effects (at means). Source: authors' elaborations.

	1871-2011	1871-1911	1911-1951	1951-1971	1971-2011
			HEALTH		
North	-0.008***	-0.009***	-0.012***	-0.024***	-0.009***
s.e.	0.000	0.002	0.000	0.001	0.001
Center	-0.006***	-0.027***	-0.023***	-0.032***	-0.015***
s.e.	0.000	0.001	0.003	0.000	0.000
South-Island	-0.007***	-0.019***	-0.003	-0.029***	-0.011***
s.e.	0.000	0.000	0.005	0.001	0.001
			LABOUR		
North	-0.011***	0.014***	-0.006***	-0.040***	-0.026***
s.e.	0.000	0.004	0.001	0.001	0.002
Center	-0.007***	0.003***	-0.006***	-0.021***	-0.020***
s.e.	0.000	0.000	0.000	0.000	0.002
South-Island	-0.010***	-0.006***	-0.014***	-0.036***	-0.005
s.e.	0.000	0.000	0.001	0.001	0.003
			EDUCATION		

[11] Results of the augmented regressions are reported in the appendix.

North	-.007***	-0.016***	-0.013***	-0.026***	-0.010***
s.e.	0.000	0.000	0.000	0.002	0.002
Center	-.007***	-0.004***	-0.017***	-0.039***	-0.017***
s.e.	0.000	0.001	0.000	0.004	0.000
South-Island	-.005***	-0.006***	-0.009***	-0.015***	-0.011***
s.e.	0.000	0.002	0.001	0.002	0.001
	ECONOMIC WELLBEING				
North	-0.007***	0.026***	0.008***	-0.013**	-0.014***
s.e.	0.001	0.001	0.001	0.005	0.002
Center	0.002	-0.005	-0.011***	0.049***	0.003***
s.e.	0	0.001	0.001	0.002	0.000
South-Island	-0.004***	-0.012***	0.014***	-0.029***	-0.017***
s.e.	0.001	0.001	0.001	0.003	0.002
	ENVIRONMENT				
North	n.a.	n.a.	0.010	0.019***	-0.005***
s.e.	n.a.	n.a.	0.001	0.012	0.001
Center	n.a.	n.a.	-0.009	0.318***	0.001
s.e.	n.a.	n.a.	0.001	0.003	0.001
South-Island	n.a.	n.a.	-0.005	0.086***	-0.015***
s.e.	n.a.	n.a.	0.001	0.01	0.001

Thus, looking at the convergence profile, it emerges that a certain convergence among regions is observed but the North is generally converging at a higher speed in the 150 years in every domain but the environment. Moreover, other major caveats can be addressed. The economic wellbeing domain is not converging for each macro area and in every period. Specifically, the Centre is not converging all over the period, and it has a divergent path after WWII. This is mainly because 2 regions are catching up with the North while others are lagging. Namely, while Lazio and Tuscany (Toscana) had been able to climb the ranking, in the last two decades Marche and Umbria lost positions signalling an economic stagnation. The interwar period, corresponding mainly with the fascist dictatorship, sees an increase in the backwardness of the South with always lower convergence speed, and some divergence. While the Grain campaign (the most populist autarchic economic policy proposed by fascism) was advertised to solve the South backwardness, it was de facto an enrichment campaign of southern elites supporting the regime (Cohen, 1979).

In the new millennium, there are signals of divergence among regions both in terms of labour and economic wellbeing. While in this paper we argue that there may be

convergence in other dimensions of wellbeing even in absence of convergence in per-capita GDP, we underline that when the GDP started its stagnation (and fall in the last period because of the 2007 crisis), the convergence path on other dimensions slowed down to even become divergence.

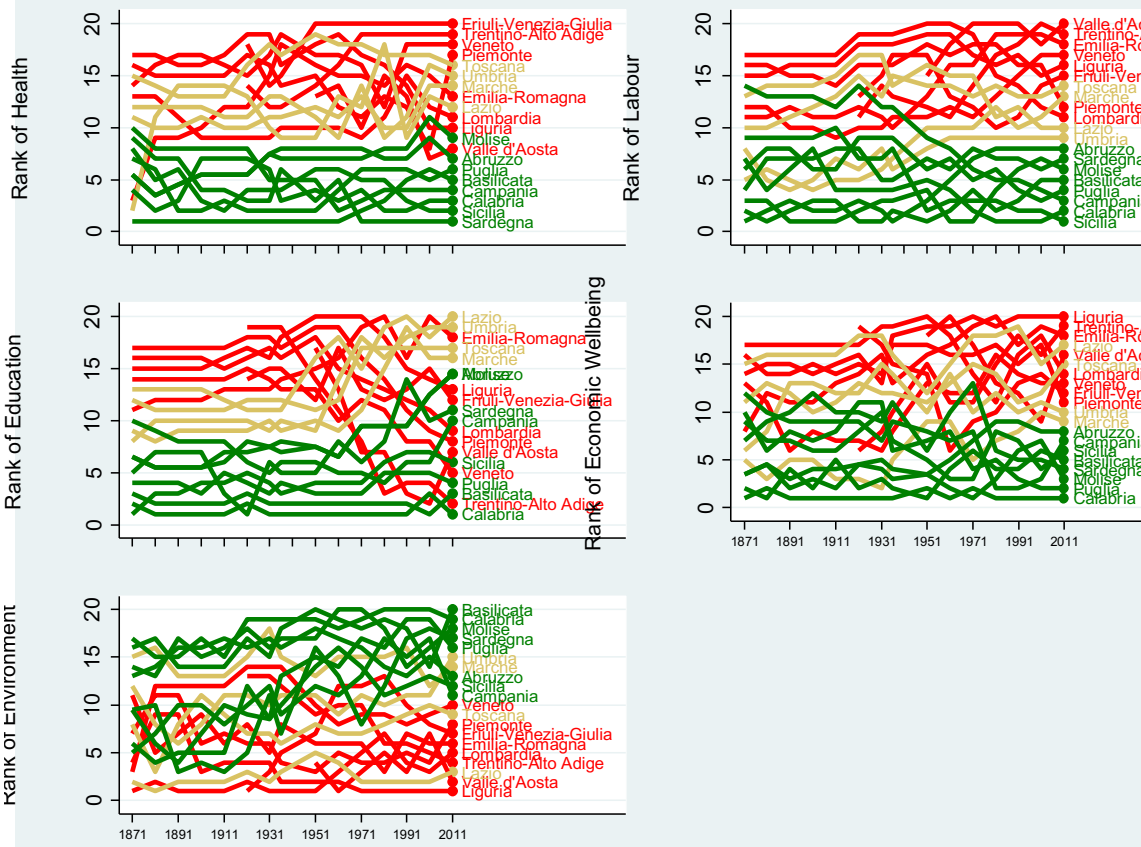

Figure 3: Regional ranking in each domain. North regions in red, Centre regions in yellow sand colour, South regions in green.

Source: authors' computations.

There is no manifest crossover among northern and southern regions in each domain but education, while regions from the Centre were able to climb the ranking in every domain. Nonetheless, the Centre had been able to massively climb the Education domain ranking only after WWII. However, the domain does not include indicators able to capture the quality of education. If this information would have been available, we expect the North, and the Centre would have overperformed the South even in this domain. Both historical (Bertola and Sestito, 2011) and contemporary analysis (INVALSI, 2020) supports the idea that while levels in education are slowly converging

(in terms of number of years of study) this is not the case in terms of quality of human capital and performances in comparative literacy and mathematical skills. In addition, we must consider that while education in the south increases, brain drain is particularly affecting those territories since WWII, exacerbating their cultural impoverishment.

5. Discussion and Conclusions

Italy is among the European countries the one showing the largest territorial economic imbalances. The so-called "Questione Meridionale" is struggling scholars and public opinion since Antonio Billa's definition. Several explanations were provided over the 160 years of modern Italian history. This paper by means of long run multidimensional analysis of wellbeing in Italian regions (NUTS-2) adds a new evidence of the economic dualism and push the boundaries of convergence analysis beyond GDP and HDI analysis.

Despite the South of the country shows persistent economic backwardness, in fact, for what concern other important domains as health and education a certain convergence was observed. Nonetheless, the speed of convergence for a catch up is very slow and this is supported by the persistency of the ranking among regions over time. Considering that Italy was unified in 1861 and shares common historical background, religion, language and central government, a faster convergence was expected. Moreover, while economic growth seems not a necessary condition for convergence in Health and Education domains, it is doubtless that it is correlated to convergence on Economic wellbeing and Work indicators. Generalizing, while the paper does not allow to provide a causal relation between economic growth and a faster convergence in other domains (but Environment), it emerged that during the economic golden age each domain converged at a higher speed.

While it was not the aim of this paper to test the hypothesis behind the convergence in the Solow model, we show that it does not hold in explaining Italian regional patterns in the long run. Indeed, it is doubtless that the persistency of the backwardness and the very slow convergence among Italian territories is striking since regions eventually share the same technology (in a broad sense). Endogenous mechanisms taking place at the local level may be hitting the society so strongly that the mere "application of similar laws and conditions" is not enough to overcome uneven distribution.

Nonetheless, Italian unification was not that negative as the Neo-Borboic position cyclically propose. Convergence was observed in two of the key domain, health, and education, which are undisputedly showing a general increase in levels and a long-run path of convergence. Similarly, as expected, fascism was everything but positive for the South of the country which came out of the period in a worst position with respect of the Centre even if the latter experienced the largest war damages.

This paper also points out the need for more data to investigate more in detail certain wellbeing aspects and the need for new methodologies for generating synthetic indicators. On the one hand, more data are necessary to better assess at the territorial level the issue of wellbeing (for education and environment). On the other, AMPI methodology shows some distortion when dealing with extremely high variation. While it is doubtless necessary to go beyond the GDP to understand the development of our society, there is always the risk to look at the parts with the glasses of time. Some information we may obtain from data, if not considered from a historical perspective, may be misleading. The Political Participation domain is a clear example. High participation may be a signal of positive participation in democracy, while it is a negative signal in a dictatorship.

REFERENCES

Acemoglu, D., Johnson, S., & Robinson, J. A. (2005). Institutions as a fundamental cause of long-run growth. Handbook of economic growth, 1, 385-472.

A'Hearn, B., Auria, C., & Vecchi, G. (2011). Istruzione. In Ricchezza e in Povertà: Il Benessere degli Italiani dall'Unità a Oggi. Il Mulino, Bologna, 159-206.

Alaimo, L. S., & Maggino, F. (2020). Sustainable development goals indicators at territorial level: Conceptual and methodological issues—The Italian perspective. Social Indicators Research, 147(2), 383-419.

Atella, V., Francisci, S., & Vecchi, G. (2011). Salute. Vecchi G. (a cura di), In ricchezza e in povertà. Il benessere degli italiani dall'Unità ed oggi, Il Mulino, Bologna, 73-129.

Bacchini, F., Baldazzi, B., & Di Biagio, L. (2020). The evolution of composite indices of well-being: An application to Italy. Ecological Indicators, 117, 106603.

Baffigi, A. (2011). Italian National Accounts, 1861–2011. Economic History Working Papers N. 18, Rome: Bank of Italy.

Baldwin, R. (2019). The globotics upheaval: Globalization, robotics, and the future of work. Oxford University PressBarro, R.J. Economic Growth in a cross section of countries. Q. J. Econ. 1991, 106, 407–443.

Barro, R.J., & Sala-i-Martin, X. (1992). Convergence. Journal of Political Economy, 100, 223–251.

Barro, R.J., & Sala-i-Martin, X. (1995). Economic Growth; McGraw Hill: New York, NY, USA.

Bertola, G., & Sestito, P. (2011). A comparative perspective on Italy's human capital accumulation. Bank of Italy Economic History Working Paper, (6).

Besley, T., & Ghatak, M. (2010). Property rights and economic development. In Handbook of development economics (Vol. 5, pp. 4525-4595). Elsevier.

Bigoni, M., Bortolotti, S., Casari, M., Gambetta, D., & Pancotto, F. (2016). Amoral familism, social capital, or trust? The behavioural foundations of the Italian North–South divide. The Economic Journal, 126(594), 1318-1341.

Bonfatti, R., Facchini, G., Tarasov, A., Tedeschi, G. L., Testa, C. (2021). Pork, Infrastructure and Growth: Evidence from the Italian Railway Expansion. CESifo Working Paper No. 9228, Available at SSRN: https://ssrn.com/abstract=3904530

Brandolini, A., & Vecchi, G. (2011). The well-being of Italians: A comparative historical approach. Eco- nomic History Working Papers N. 19, Rome: Bank of Italy.

Brunello, G., & Checchi, D. (2005). School quality and family background in Italy. Economics of education review, 24(5), 563-577.

Bucur, I. A., & Stangaciu, O. A. (2015). The European Union convergence in terms of economic and human development. CES Working Papers, 7(2), 256.

Butkus, M., Cibulskiene, D., Maciulyte-Sniukiene, A., & Matuzeviciute, K. (2018). What is the evolution of convergence in the EU? Decomposing EU disparities up to NUTS 3 level. Sustainability, 10(5), 1552.

Carlucci, F., Cirà, A., Immordino, G., Ioppolo, G., & Yigitcanlar, T. (2017). Regional heterogeneity in Italy: Transport, devolution and corruption. Land use policy, 66, 28-33.

Casadio Tarabusi, E., & Guarini, G., (2013). An unbalance adjustment method for development indicators. Social Indicators Research 112, 19–45.

Chelli, F. M., Ciommi, M., Ermini, B., Gallegati, M., Gentili, A., & Gigliarano, C. (2018). San Matteo e la provvidenza. I luoghi ei tempi dello sviluppo italiano. Rivista giuridica del Mezzogiorno, 32(3), 643-672.

Ciccarelli, C., & Fenoaltea, S. (2013). Through the magnifying glass: provincial aspects of industrial growth in post-Unification Italy 1. The Economic History Review, 66(1), 57-85.

Ciommi, M., Gentili, A., Ermini, B., Gigliarano, C., Chelli, F. M., & Gallegati, M. (2017a). Have your cake and eat it too: The well-being of the Italians (1861–2011). Social Indicators Research, 134(2), 473-509.

Ciommi, M., Gigliarano, C., Emili, A., Taralli, S., & Chelli, F.M., (2017b). A new class of composite indicators for measuring well-being at the local level: an application to the Equitable and Sustainable well-being (BES) of the italian provinces. Ecological Indicators 76, 281–296.

Cohen, J. S. (1979). Fascism and agriculture in Italy: policies and consequences. The Economic History Review, 32(1), 70-87.

Corbetta P. & Piretti M.S. (2009), Atlante storico-elettorale d'Italia: 1861-2008, Bologna, Zanichelli.

Crescenzi, R., & Rodríguez-Pose, A. (2012). Infrastructure and regional growth in the European Union. Papers in regional science, 91(3), 487-513.

Cusmano, L., Mancusi, M. L., & Morrison, A. (2009). Innovation and the geographical and organisational dimensions of outsourcing: Evidence from Italian firm-level data. Structural Change and Economic Dynamics, 20(3), 183-195.

Daniele, V., & Malanima, P. (2011). Il divario nord-sud in Italia, 1861-2011 (Vol. 273). Rubbettino Editore.

Dalgaard, C. J., & Vastrup, J. (2001). On the measurement of σ-convergence. Economics letters, 70(2), 283-287.

Dapena, A. D., Vázquez, E. F., & Morollón, F. R. (2016). The role of spatial scale in regional convergence: the effect of MAUP in the estimation of $$\beta $$-convergence equations. The Annals of Regional Science, 56(2), 473-489.

Di Martino, P., Felice, E., & Vasta, M. (2020). A tale of two Italies: 'access-orders' and the Italian regional divide. Scandinavian Economic History Review, 68(1), 1-22.

Di Nino, V., Eichengreen, B., & Sbracia, M. (2011). Real exchange rates, trade, and growth: Italy 1861–2011. Economic History Working Papers N. 10, Rome: Bank of Italy.

De Muro, P., Mazziotta, M., & Pareto, A. (2011). Composite indices of development and poverty: An application to MDGs. Social indicators research, 104(1), 1-18.

Durand, M. (2015). The OECD better life initiative: How's life? and the measurement of well-being. Review of Income and Wealth, 61(1), 4-17.

Durlauf, S.N., & Quah, D.T. (1999), The new empirics of economic growth, in Taylor, J.B. & Woodford, M. (eds.), Handbook of Macroeconomics, vol. IA, Cap. 4, North-Holland, Amsterdam.

Eckaus, R. S. (1961). The North-South differential in Italian economic development. Journal of Economic History, 285-317.

Eurostat (2019). Eurostat regional yearbook 2019. Önnerfors, Å., Kotzeva, M., & Brandmüller, T. Eurostat, Brussel, Belgium. (DOI): 10.2785/1522

Felice, E. (2011). Regional value added in Italy, 1891–2001, and the foundation of a long-term picture 1. The Economic History Review, 64(3), 929-950.

Felice, E. (2012). Regional convergence in Italy, 1891–2001: testing human and social capital. Cliometrica, 6(3), 267-306.

Felice, E. (2013). Perché il Sud è rimasto indietro. Bologna: il Mulino.

Felice, E., & Vasta, M. (2015). Passive modernization? The new human development index and its components in Italy's regions (1871–2007). European Review of Economic History, 19(1), 44-66.

Felice, E. (2019). The roots of a dual equilibrium: GDP, productivity, and structural change in the Italian regions in the long run (1871–2011). European Review of Economic History, 23(4), 499-528.

Fenoaltea, S. (2003). Peeking backward: regional aspects of industrial growth in post-unification Italy. Journal of Economic History, 1059-1102.

Ferrara, A. R., & Nisticò, R. (2019). Does institutional quality matter for multidimensional well-being inequalities? Insights from Italy. Social Indicators Research, 145(3), 1063-1105.

Frank, A. G. (1960). Human capital and economic growth. Economic Development and Cultural Change, 8(2), 170-173.

Fuà, G. (1978). Lagged development and economic dualism. PSL Quarterly Review, 31(125).

Gentili, A. (2021). L'istruzione in Italia, storia di un fallimento. In Gentili A., & Pignataro, G. "Disuguaglianze e istruzione in Italia" (2021). Carocci Editore

Greco, S., Ishizaka, A., Tasiou, M., & Torrisi, G., (2019). On the methodological framework of composite indices: a review of the issues of weighting, aggregation, and robustness. Social Indicators Research 141, 61–94.

Haggard, S., & Tiede, L. (2011). The rule of law and economic growth: where are we?. World development, 39(5), 673-685.

Konya, L., & Guisan, M. C. (2008). What does the human development index tell us about convergence? Applied Econometrics and International Development, 8(1).

Iammarino, S., Rodríguez-Pose, A., & Storper, M. (2019). Regional inequality in Europe: evidence, theory and policy implications. Journal of economic geography, 19(2), 273-298.

INVALSI (2020). Rapporto prove INVALSI. .

Istat (2015). Rapporto Bes: Il benessere equo e sostenibile in Italia. Istat, Roma. http://www.istat.it/it/archivio/175169 .

Istat (2018), Serie storiche Istat, http://seriestoriche.istat.it/ .

Johnson, P., & Papageorgiou, C. (2020). What remains of cross-country convergence?. Journal of Economic Literature, 58(1), 129-75.

Lutz, V. (1962). Italy. A study in economic development. Italy. A study in economic development.

N. G. Mankiw, D. Romer, D.N. Weil, (1992). A Contribution To The Empirics Of Economic Growth.

Quarterly Journal of Economics, May, Pp. 407-437.

Mayer-Foulkes, D. (2012). Divergences And Convergences In Human Development. Indian Journal of Human Development, 6(2), 175-224.

Mazumdar, K. (2002). A Note on Cross-Country Divergence in Standard of Living, Applied Economics Letters, vol. 9, pp. 87-90.

Mazziotta, M., & Pareto, A. (2018). Measuring well-being over time: the adjusted Mazziotta–Pareto index versus other non-compensatory indices. Social Indicators Research, 136(3), 967-976.

Mazziotta, M., & Pareto, A., (2016). On a generalized non-compensatory composite index for measuring socio-economic phenomena. Social Indicators Research 127 (3), 983–1003.

Mazziotta, M., & Pareto, A. (2014). A composite index for measuring Italian regions' development over time. Rivista italiana di economia e demografia, 68(3/4).

Meliciani, V., & Peracchi, F. (2006). Convergence in per-capita GDP across European regions: a reappraisal. Empirical Economics, 31(3), 549-568.

Missiaia, A. (2019). Market versus endowment: explaining early industrial location in Italy (1871–1911). Cliometrica, 13(1), 127-161.

MinInt, Ministero degli Interni (2018). Eligendo Open data. https://dait.interno.gov.it/elezioni .

Monfort, P. (2008). Convergence of EU regions: Measures and evolution. Brussels: European Commission, Regional Policy.

Morrison, P. S. (2014). The measurement of regional growth and wellbeing. Handbook of regional science, 277-289.

Noorbakhsh F. (2007). International Convergence or Higher Inequality in Human Development? Evidence for 1975–2002. In: Mavrotas G., Shorrocks A. (eds) Advancing Development. Studies in Development Economics and Policy. Palgrave Macmillan, London. https://doi.org/10.1057/9780230801462_9

OECD (2008). Handbook on constructing composite indicators: Methodology and user guide. Paris: OECD publishing.

OECD (2014). How's Life in Your Region?: Measuring Regional and Local Well-being for Policy Making. OECD Publishing.

Solow, R. M. (1956). A contribution to the theory of economic growth. The quarterly journal of economics, 70(1), 65-94.

Sorens, J. (2014). Does fiscal federalism promote regional inequality? An empirical analysis of the OECD, 1980–2005. Regional Studies, 48(2), 239-253.

Stark, O., & Taylor, J. E. (1989). Relative deprivation and international migration oded stark. Demography, 26(1), 1-14.

Stiglitz, J. E., Sen, A., & Fitoussi, J. P. (2009). Report by the commission on the measurement of economic performance and social progress.

Sutcliffe, B. (2004): World Inequality and Globalization, Oxford Review of Economic Policy, vol. 20, pp. 15-37.

Swan, T. W. (1956). Economic growth and capital accumulation. Economic record, 32(2), 334-361.

Terzi, S., Otoiu, A., Pareto, A., Grimaccia, E., & Mazziotta, M. (2021). Open issues in composite indicators. A starting point and a reference on some state-of-the-art issues (Vol. 3). Roma TrE-Press.

Van Zanden, J. L., Baten, J., Mira d'Ercole, M., Rijpma, A., Smith, C., & Timmer, M. (2014). How was life?: Global well-being since 1820. OECD publishing.

Vecchi, G. (2011). In ricchezza e in poverta`. Il benessere degli Italiani dall'Unita` a oggi. Bologna: Il Mulino

Williamson, J. G. (1965). Regional inequality and the process of national development: a description of the patterns. Economic development and cultural change, 13(4, Part 2), 1-84.

Yang, F., Shiying P., & Yao, X. (2016). Regional convergence and sustainable development in China. Sustainability 8.2: 121.

Appendix/Online materials

Table A1. Convergence and macro-area growth dynamic over 1871-2011 and sub-periods

	1871-2011	1871-1911	1911-1951	1951-1971	1971-2011
	Health				
ln(AMPI Health 1871)	-0.008***	-0.009***	-0.012***	-0.024***	-0.009***
	(0.000)	(0.002)	(0.000)	(0.001)	(0.001)
Dummy for Centre	-0.005***	0.070***	0.044***	0.033***	0.025***
	(0.001)	(0.010)	(0.012)	(0.006)	(0.003)
Dummy for South	-0.001	0.036***	-0.037*	0.021***	0.008
	(0.001)	(0.008)	(0.019)	(0.007)	(0.005)
Centre x ln(AMPI Health 1871)	0.001***	-0.018***	-0.011***	-0.007***	-0.006***
	(0.000)	(0.002)	(0.003)	(0.001)	(0.001)
South x ln(AMPI Health 1871)	0.000	-0.010***	0.009*	-0.005***	-0.002
	(0.000)	(0.002)	(0.005)	(0.002)	(0.001)
Constant	0.035***	0.043***	0.057***	0.112***	0.045***
	(0.001)	(0.008)	(0.001)	(0.005)	(0.003)
Observations	240	240	240	285	285
R^2	0.957	0.779	0.186	0.896	0.863
	Labour				
ln(AMPI Labour 1871)	-0.011***	0.014***	-0.006***	-0.040***	-0.026***
	(0.000)	(0.004)	(0.001)	(0.001)	(0.002)
Dummy for Centre	-0.015***	0.048***	0.000	-0.084***	-0.027**
	(0.001)	(0.016)	(0.003)	(0.006)	(0.013)
Dummy for South	-0.004***	0.085***	0.032***	-0.021***	-0.099***
	(0.001)	(0.016)	(0.005)	(0.007)	(0.018)
Centre x ln(AMPI Labour 1871)	0.004***	-0.011***	-0.000	0.019***	0.006**
	(0.000)	(0.004)	(0.001)	(0.001)	(0.003)
South x ln(AMPI Labour 1871)	0.001***	-0.020***	-0.008***	0.004**	0.022***
	(0.000)	(0.004)	(0.001)	(0.002)	(0.004)
Constant	0.048***	-0.060***	0.028***	0.184***	0.122***
	(0.000)	(0.016)	(0.003)	(0.005)	(0.011)
Observations	240	240	240	285	285
R^2	0.968	0.266	0.831	0.873	0.338
	Education				
ln(AMPI Education 1871)	-0.007***	-0.016***	-0.013***	-0.026***	-0.010***
	(0.000)	(0.001)	(0.000)	(0.002)	(0.002)
Dummy for Centre	-0.001**	-0.049***	0.018***	0.058***	0.030***
	(0.001)	(0.004)	(0.002)	(0.019)	(0.008)
Dummy for South	-0.007***	-0.045***	-0.014***	-0.048***	0.004
	(0.001)	(0.008)	(0.004)	(0.011)	(0.008)
Centre x ln(AMPI Education 1871)	0.000***	0.012***	-0.004***	-0.013***	-0.007***

	(0.000)	(0.001)	(0.001)	(0.004)	(0.002)
South x ln(AMPI Education 1871)	0.002***	0.011***	0.003***	0.011***	-0.001
	(0.000)	(0.002)	(0.001)	(0.003)	(0.002)
Constant	0.033***	0.073***	0.059***	0.119***	0.047***
	(0.000)	(0.002)	(0.002)	(0.008)	(0.008)
Observations	240	240	240	285	285
R^2	0.995	0.728	0.960	0.927	0.844
	Economic wellbeing				
ln(AMPI Ec. Wellbeing 1871)	-0.007***	0.026***	0.008***	-0.014**	-0.014***
	(0.001)	(0.001)	(0.001)	(0.005)	(0.002)
Dummy for Centre	-0.039***	0.127***	0.079***	-0.258***	-0.072***
	(0.005)	(0.007)	(0.006)	(0.025)	(0.008)
Dummy for South	-0.014***	0.157***	-0.024***	0.066**	0.011
	(0.005)	(0.007)	(0.007)	(0.027)	(0.011)
Centre x ln(AMPI Ec. Wellbeing 1871)	0.010***	-0.031***	-0.020***	0.063***	0.016***
	(0.001)	(0.002)	(0.001)	(0.006)	(0.002)
South x ln(AMPI Ec. Wellbeing 1871)	0.003***	-0.039***	0.005***	-0.016**	-0.003
	(0.001)	(0.002)	(0.002)	(0.007)	(0.002)
Constant	0.035***	-0.107***	-0.031***	0.066***	0.067***
	(0.004)	(0.006)	(0.004)	(0.023)	(0.007)
Observations	240	240	240	285	285
R^2	0.613	0.761	0.860	0.411	0.614
	Environment				
ln(AMPI Environment 1871)	0.130***	0.215***	0.009***	0.019	-0.005***
	(0.016)	(0.010)	(0.001)	(0.012)	(0.001)
Dummy for Centre	-1.215***	0.145**	0.105***	-1.694***	-0.033***
	(0.108)	(0.065)	(0.007)	(0.071)	(0.010)
Dummy for South	0.000***	-0.000***	0.084***	-0.378***	0.053***
	(0.000)	(0.000)	(0.010)	(0.090)	(0.011)
Centre x ln(AMPI Environnement 1871)	0.213***	-0.025**	-0.018***	0.299***	0.006***
	(0.019)	(0.011)	(0.001)	(0.012)	(0.002)
South x ln(AMPI Environment 1871)	0.000	0.000	-0.015***	0.067***	-0.009***
	(0.000)	(0.000)	(0.002)	(0.016)	(0.002)
Constant	-0.746***	-1.228***	-0.054***	-0.118*	0.024***
	(0.088)	(0.056)	(0.007)	(0.068)	(0.008)
Observations	240	240	240	285	285
R^2	0.788	0.769	0.899	0.627	0.429