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Industrial districts and socio-economic well-being: an investigation on the Italian provinces disparities

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Abstract

This paper examines the territorial disparities between Italian provinces through an alternative measure (well-being composite index) as opposed to traditional ones (value added), in order to assess the possible industrial district (ID) effect on growth performance. The analysis shows that the ID effect is absent when considering (per capita) value added growth, which confirms recent empirical evidence, while it is significant when considering well-being. Furthermore, "highly ID provinces" show a relatively better performance in terms of population growth rates, which, combined with their better socio-economic conditions, sheds new light on the explanation of the persistence of Italian disparities and gives interesting insights for the design of sounder local policy measures.

Keywords: well-being; Industrial District effect; regional disparities; Italian provinces

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1. Introduction

During the last decades, Italian Industrial Districts (hereafter IDs) have experienced persistent economic growth, favoured by their peculiar organisational and production flexibility (Becattini, 2000). However, recently the vitality of this model and its capability to react to a changing world economic framework have been debated (Iuzzolino 2008; Foresti et al. 2009; Iannuzzi and Berardi 2012; Piergiovanni et al. 2012).

The relevant question is whether IDs keep showing an advantage in terms of growth (the so called "ID effect") compared to non–ID systems.

The literature dealing with this issue has typically focused on the relationship between the "degree of district intensity" and economic growth *strictu sensu*, measured through GDP, value added, export or firm turnover (Becattini and Coltorti 2006; Becattini and Dei Ottati 2006; Amighini et al. 2011; Iuzzolino and Minon 2011; Di Berardino and Sarra 2013; Di Giacinto et al. 2014). Even though the results can hardly be considered conclusive, the lack of an ID effect seems to be the prevailing empirical finding in recent research (Iuzzolino 2008; Foresti et al. 2009; Piergiovanni et al. 2012).

Our paper deals with this issue by adopting a different perspective, building from the key idea in the well-being literature that traditional economic indicators provide only a partial picture of complex phenomena such as the welfare of communities (Michalos 2008; Costanza et al. 2009; Fleurbaey 2009; Stiglitz et al. 2009; UNDP 2010; Larraz Iribas and Pavia 2010; OECD 2011).

We show that the territories characterised by the presence of an ID have an advantage over non–ID systems when the performance is measured in terms of well-being. Hence, the benefits of the presence of an ID on a territory are twofold: on the one hand, it provides an "atmosphere" which facilitates the emergence of dynamic and competitive industrial systems. The recent evidence, however, shows that IDs' capability to assure such "growth plus" has drained away; on the other hand, the ID *milièu* is capable of locally ensuring social benefits, as long as it seems to be capable of transforming the economic processes occurring in the territory into community well-being. Such

a property is reflected in high population growth rates and in the long term implies a higher stability of the contexts which IDs themselves are a part of.

The empirical analysis is based on ISTAT data on Italian NUTS 3 regions (provinces) for the period 2000–2007. Mirroring the methodology adopted in the literature to classify Italian provinces according to the presence of ID-type local labour systems (De Arcangelis and Ferri 2005; Signorini and Omiccioli 2005; Amighini et al. 2011; Di Berardino and Sarra 2013), we investigate the relationship between the "degree of district intensity" and the growth performance measured in terms of well-being. The composite well-being index is built along the lines of Ferrara and Nisticò (2013), who study the convergence in the Italian regions (NUTS 2), as a weighted average of four aggregate sub-indices representing different dimensions of well-being and quality of life.

In contrast to other studies, predominantly based on sigma and rank convergence methodologies (Giannias et al. 1999; Ferrara and Nisticò 2013), our empirical analysis follows the beta convergence approach. Marchante and Ortega (2006) adopt the same methodology to analyse Spanish regions, taking the approach of "unconditional" convergence; gaps in the research literature on the determinants of well-being do not allow to go further or to conduct analyses aimed at testing the validity of theoretical models of growth.

Based on these considerations, our study on the role of IDs does not test the validity of the theoretical hypothesis of conditional convergence, but rather verifies the existence of a link between the performance and the "degree of district intensity" of the province, within a framework that allows this relationship to be specified once the initial level of "wealth" is kept constant. In this way, the data respond to the question of whether there is in Italy a reduction of unbalances and if the "degree of district intensity" represents a discriminant of the growth performance of the provinces.

The paper is organised as follows: in the next section the relevant literature on economic and social welfare is briefly presented; in section 3 the data and methodology are described; the empirical analysis is in section 4; some policy remarks conclude the paper.

2. Conceptual framework

2.1 Beyond GDP: convergence and well-being indicators

Studies on territorial differences between countries and regions, as well as on the convergence process, are commonly based on GDP per capita. Many contributions in recent years have, however, highlighted the limits of interpretation of this indicator for measuring the well-being of a production system and the community that lives in it (Dasgupta and Weale 1992; Mazumdar 1999; Michalos 2008; Fleurbaey 2009; Bleys 2012). The criticisms were mostly related to the inappropriate use of the indicator as a measure of human development (Costanza et al. 2009). Several works have focused on the identification of new measures and indicators that could better represent the complexity and the different facets of the phenomenon (Stiglitz et al. 2009; Larraz Iribas and Pavia 2010; UNDP 2010; OECD 2011). What emerged from these studies is not the complete rejection of GDP per capita, but rather the need to measure well-being according to a multidimensional view, where the economic dimension is considered together with the human, social and environmental dimensions.[1]

Recently, this approach has also been adopted in the literature on convergence dealing with the analysis of growth differentials through aggregate and composite indices of well-being, which could also allow an assessment from a territorial point of view.[2] Giannias et al. (1999) measures the convergence between European states through a set of indicators with the goal of combining economic variables (GDP per capita, price index and households expenditure) with those related to

[1] In fact, as stated in the Stiglitz Report (Stiglitz et al. 2009: 8), "the GDP is not wrong as such, but wrongly used. What is needed is a better understanding of the appropriate use of each measure"; or, Costanza et al. (2009: 4) "it is also important to recognize that GDP is not inherently bad – it measures what it measures. Rather it is being misused as an indicator of something it doesn't measure and was never intended to measure".

[2] Especially with reference to the European Union, the European Commission (Commission of the European Communities 2009) has promoted many initiatives on the issue of well-being aimed at rethinking policies on economic and human development.

quality of life (number of cars, telephones, TV sets or doctors per capita). Marchante and Ortega (2006) analyses the situation of the Spanish regions using an updated version of the aggregate HDI (Human Development Index) as an indicator of the quality of life. In both cases, there is evidence of the permanence of gaps when using economic indices, while the differentials reduce over time when the convergence is measured through indicators that take into account quality of life. Recently, Rodríguez-Pose e Maslauskaite (2012) study the individual and macro-level determinants of individual life satisfaction in 10 EEC countries. The results highlight that macroeconomic and institutional differences are the key factors behind the lack of convergence in life satisfaction. The different levels of individual happiness in EEC are therefore mostly determined by institutional factors such as corruption, government spending and decentralization.

2.2 Well-being in Italy: the empirical literature

From the empirical point of view, the Italian situation is of particular importance – the study of its characteristics and specificities can contribute significantly to the literature on territorial differentials in Europe. In fact, the degree of spatial inequality is among the highest in Europe and reflects a persistent internal dualism between the two areas of the country (Centre-North and South). A peculiar aspect of Italy highlighted in Cersosimo and Nisticò (2013) is that, unlike other European countries, it shows a strong correlation between economic and civil backwardness. That is, in Italy the regional differences in the availability and quality of local public services largely reflect the economic gaps. This does not seem to happen in other countries, which over the years have instead succeeded in reducing disparities. Persistent quantitative and qualitative gaps characterise the South regions as far as civil rights are concerned, such as education, care and the welfare of weaker population.

A plethora of works have addressed the issue of disparities by taking into account the sole economic dimension, while quite a few are studies which, relying on a wide range of well-being indicators, focus on regional gaps and on the convergence among territories. Among the former, Giannone (1997) presents a first attempt to measure the economic development through the use of regional data on household spending for goods and services, in particular leisure-time services, identified as indicators alternative to disposable income. Grasso (2002) uses a more complex methodological framework in which a composite indicator of economic and social welfare is designed to complement GDP per capita. These works, however, have the characteristic of detecting differences using a static approach, i.e. providing a picture of the situation in a specific moment. In contrast, the analysis of convergence implies a dynamic approach in order for growth rates and the temporal evolution of regional disparities to be assessed. In this respect, Felice (2007) studies regional gaps from 1871 to 2001 measured over seven social indicators, including aggregate indices such as (an extended version of) the HDI. Capriati (2011) studies the evolution of regional disparities between 1998 and 2007 by means of a composite index of "actual freedom". Cannari and D'Alessio (2012) investigate regional disparities by relying on GDP per capita, other economic indicators such as the stock of household wealth, and social well-being indicators such as life expectancy and education levels. Finally, Ferrara and Nisticò (2013) test the presence of regional convergence through two aggregate indicators for the period 1998–2008. In particular, the authors build on a version of the HDI proposed by Marchante et al. (2006) and extend the analysis through a composite index of well-being, obtained by including other aspects such as socio-institutional quality of the local context, the degree of competitiveness of the productive system and the index of equal opportunities in the labour market. Unlike other works on Italy, this study allows the analysis of multiple dimensions of well-being on the one hand, and the easier measurement of the evolution of regional disparities through the composite index on the other.[3]

[3] The authors develop new sub-indices in line with the guidelines suggested by Stiglitz et al. (2009) and the OECD (2011). The new dimensions taken into account in the construction of the aggregate index of well-being reflect the most important information resulting from the analysis of Italian disparities conducted on a wide range of economic, social and civic indicators (Banca d'Italia 2010).

The present work is based on the contribution of Ferrara and Nisticò (2013) for the choice of the calculation of the composite index, but differs from it for two reasons: first, the study deals with the development gaps on a finer spatial scale (NUTS 3) and this allows the gathering of insights on local dynamics which could not be identified through analyses at the regional level; second, it focuses on the impact of IDs, which, in contrast to the other European countries, predominantly and strongly characterise the model of local development in Italy.

2.3 Well-being and IDs: a gap to be filled?

IDs and their role in explaining growth differentials at the regional level have been completely neglected by scientific studies on Italian well-being. There is a broad consensus in the less-recent literature which considers IDs as an engine of Italian economic (and manufacturing) growth. Over the last decade, however, a lively debate has arisen about the possibility that they still have better performances than non–ID systems. Indeed, in most recent studies no evidence has emerged on the presence of a "district effect". Piergiovanni et al. (2012) analyse employment and value added growth rates in the years 2001–2006 for the Italian provinces and emphasise the lack of a statistically significant effect related to the presence of IDs in the local systems. These results add to those of Iuzzolino (2008), which is based on census data on the number of employees in local labour systems (ISTAT, 2005) and those of Foresti et al. (2009), who rely on corporate balance sheet data.

However, to the best of our knowledge there are no scientific works investigating the link between IDs and well-being nor any addressing the issue of ID effects through indicators that are not strictly economic.[4] The only exception is the study of Fowler and Kleit (2014), which finds a positive effect of industrial clusters on poverty rate at the county level in the United States. In this

[4] There are studies in the literature that deal with similar issues. However, these studies do not address the question of whether IDs have any effects on socio-economic growth performance, rather they assess the role of social factors as originators of IDs (Di Giacinto and Nuzzo 2005; Micucci and Nuzzo 2005; Signorini and Omiccioli 2005).

case, the work is based on a concept of the district which is typical of the Porter approach (Porter 1998), according to which the district is considered in merely "productive" terms, as a system essentially based on the presence of specialised firms and densely concentrated at the local level. In contrast, in the traditional Italian school the ID is not limited only to geographical concentration of firms (Becattini 1989; Sforzi 2002). In this case, ID rather evokes a peculiar interaction between firms and communities, both understood as subsystems that, through their mutual interrelations, shape the characteristics of the local system.[5] In other words, the peculiar features of IDs are not limited to spatial concentration and specialisation of small businesses, but include also, and perhaps above all, the presence of more purely qualitative factors: the spirit of cooperation, the cultural and social sharing that make the territory and the local community closely tied each other. Within this environment, technical and specialised knowledge sediments and accumulates, improving competitiveness. In this respect, we think that the idea of studying the growth of local performances through a multidimensional view is particularly consistent with the nature of the processes in place.

3. The construction of the socio-economic well-being indicator

The central point is to identify a set of indicators that cover the main dimensions of socio-economic well-being. Dasgupta and Weale (1992) suggest using an aggregate indicator for an analysis meant to investigate multidimensional phenomena. According to the authors, the choice of a synthetic indicator can provide better support to the process of evaluation of public policies. Even in studies on Italian regional economies, the same approach has been adopted (Grasso 2002: 5).

In this respect, the present work follows Ferrara and Nisticò (2013), but, because of different data availability, proposes a modified version of the aggregate indicator, calculated at the province level.

[5] Becattini (1989: 112) defined an ID as "socio-economic territorial entity characterized by the active co-presence – in a geographically limited, historically and naturalistically defined area – of a community of people and a population of industrial enterprises that have internalized a system of values and of rules of behavior that foster competition and cooperation among local businesses" [authors note: our translation].

The first step involves the construction of an index that refers to the HDI developed by the United Nations Development Programme (UNDP). It represents a weighted average of three sub-indicators related to longevity, knowledge and living standards.[6] Respectively: life expectancy at birth, education level and per capita value added. As concerns the first sub-indicator (Life – Equation 1), life expectancy at birth (Av) is normalised by assuming 25 and 85 years as minimum and maximum values:

$$Life_j(t) = \frac{Av_j(t) - 25}{85 - 25} \quad (1)$$

As for the second sub-indicator (Schooling – Equation 2), we use the percentage of individuals who have completed their compulsory schooling. This value is then combined with the level of gross schooling enrollment, that is, the overall rate of schooling including primary, secondary and tertiary levels. The Schooling sub-indicator results from the weighted average of these two measures. Higher levels of the sub-indicator correspond to higher levels of well-being, assuming that high levels of education imply a generalised propensity to increase both cultural and income expectations:

$$\text{Schooling}_j(t) = \frac{1}{3}\,\text{CompSch}_j(t) + \frac{2}{3}\,\text{GrossEnr}_j(t) \quad (2)$$

The third sub-indicator is based on a normalised version of the per capita value added (PCVA – Equation 3). An upper threshold level of income is set at 32,000 euros.[7] This sub-indicator measures aspects of human development which are not necessarily correlated to the level of education and health:

[6] It is worth noting that the choice of the variables that eventually enter into the calculation of the indices represent a compromise between the availability of statistical data (provided by ISTAT) and the need that they be representative enough of the observed phenomena (Grasso 2002).

[7] This value is determined by considering that the index proposed by UNDP refers to a $40,000 upper threshold.

(3) $$PCVA_j(t) = \frac{\log\left(PCVA_j(t)\right) - \log(100)}{\log(32,000) - \log(100)}$$

The HDI index is the simple average of the three sub-indicators and ranges between 0 and 1:

(4) $$\text{HDI(t)} = \frac{1}{3}\,\text{Life}_j\text{(t)} + \frac{1}{3}\,\text{Schooling}_j\text{(t)} + \frac{1}{3}\,\text{PCVA}_j\text{(t)}$$

The second step involves the construction of another index which synthesises other aspects related to social conditions. It is meant to provide an organised set of information on the dynamics of the economic status, on the access to jobs without gender inequalities and on the rights to security, education, health, livability, mobility and public safety.

Specifically, three sub-indicators have been used: an index of equal opportunities, an index of structural competitiveness, and an index of socio-institutional quality. The index of Equal Opportunities (EQUAL) measures the degree of participation in the labour market of young people and women. It is calculated combining the reciprocal of the youth unemployment rate (Young) and the ratio between female and male employment rates (Gender). In the first case, the greater the difficulty gaining access to the labour market for young people, the lower the values. Similarly, the greater the discrimination of women in the labour market, the lower the values of the index. The simple average of these two measures is the EQUAL indicator, which takes values close to one in the absence of gender/youth biases in the labour market:

(5) $$\text{EQUAL}_j\text{(t)} = \frac{1}{2}\,\text{Young}_j\text{(t)} + \frac{1}{2}\,\text{Gender}_j\text{(t)}$$

(6) $$\text{Young}_j\text{(t)} = \frac{\text{total unempl. rate}}{\text{youth unempl. rate}}$$

(7) $$\text{Gender}_j(t) = \frac{\text{female unempl. rate}}{\text{male unempl. rate}}$$

As for the third step, an index of Competitiveness (COMP) is calculated by combining three dimensions representing territorial penetration in international markets and the ability to adapt to changes in the structure of production technology. Namely: export as a share of GDP (Exp), investments in R&D as a share of GDP (InvR&D) and the share of employees in R&D on total employees (OccupR&D).

The COMP index is the simple average of these three sub-indicators, and increases when the territory is characterised by better competitive conditions:

(8) $$\text{COMP}_j(t) = \frac{1}{3}\,\text{Exp}_j(t) + \frac{1}{3}\,\text{InvR\&D}_j(t) + \frac{1}{3}\,\text{OccupR\&D}_j(t)$$

The index of Socio-institutional Quality (SOCQUAL) refers to variables related to aspects of social life, which can only indirectly be linked to the income levels of the community. In its construction we consider: the complement to either: the Criminality index (Cri), the value of which increases the lower the crime rate; the rate of hospitalisation (Hos), measured as the ratio between hospital stays and resident population, which indicates the response to the resident population's demand for hospital care; the degree of sustainable mobility (Mob), measured in terms of square metres per hundred inhabitants of bicycle lanes and pedestrian paths; the density of urban green spaces (Green); the rate of accidents in the workplace (Accid); or the percentage of separate waste collection (Sepw). These sub-indices, equally weighted, compose the SOCQUAL indicator, which assumes higher values the better the socio-institutional conditions are:

(9)

$$SOCQUAL_j(t) = \frac{1}{6}Cri_j(t) + \frac{1}{6}Hos_j(t) + \frac{1}{6}Mob_j(t) + \frac{1}{6}Green_j(t) + \frac{1}{6}Accid_j(t) + \frac{1}{6}Sepw_j(t)$$

The composite well-being indicator (WELL-BEING) is then constructed as the simple average of the four sub-indices (HDI; EQUAL; COMP; SOCQUAL) just described.

4. Data and descriptive statistics

The identification of ID-type areas is the central aspect to any empirical work that aims at assessing the possible effects that the presence of an ID exerts on a certain economic phenomenon (Federico, 2006). In this respect, one of the thorniest issues that must be taken into account is that ID boundaries do not coincide with local administrative units' boundaries; typically an ID has a smaller extension than the province and may contain several neighbouring municipalities belonging to different provinces. For this reason, it is difficult to properly measure the ID effect when data are only available at the regional or the provincial level. However, the concept of "degree of district intensity" can overcome this problem, since it can be calculated for geographic scales consistent with the geographic level of the available regional statistics (in our case, the provincial level).[8] The "degree of district intensity" is calculated as the share of employment in industries belonging to an ID on the industry total employment at the provincial level. The employees referable to IDs are surveyed by ISTAT for each local labour system.[9]

[8] For further details see the book edited by Signorini and Omiccioli (2005) and in particular the included contribution by De Arcangelis and Ferri (2005), who adopt similar methodologies to assess the ID effect.

[9] The identification of ID areas in the national territory involves the use of the concept of Local Labour Systems (LLSs). LLSs are aggregations of municipalities, the boundaries of which are identified on the basis of the flows related to work and study commuting surveyed in the ISTAT Census. Once all the LLSs are identified, a multi-stage process is undergone in order to assess whether each of them has or does not have the characteristic of an ID. This process includes: a) the identification of the local manufacturing system; b) the identification of local manufacturing systems that are small and medium sized (SME), such as those in the size class 1 to 249 employees; c) the identification of the predominant manufacturing sector in each local system of SMEs; d) the labelling of the local system of manufacturing SMEs as an ID when its main industry

By construction, the "degree of district intensity" is a continuous variable that ranges between zero (no employee in the province works in an ID-related sector) and one (all of the workers are employed in firms belonging to IDs). Table 1 shows its values by macro-areas. The Italian average is 0.29, which means that about one third of workers in local manufacturing are employed in IDs. Values are higher for the Centre-North (0.43) than for the South (0.04).

Another way to describe IDs' diffusion across the national territory is to use a dichotomous classification, separating the provinces in which at least one local labour system characterised by non-zero employment in IDs is present (the "ID provinces") from those without any ID. At the national level, the "ID provinces" are 66, covering 61.7% of the Italian territory; in Centre-North they are 57 (85% of the macro-area) while in the South the percentage reaches 28% (Table 2). The gap between macro-areas is even wider when considering "highly ID provinces", defined as those characterised by a "degree of district intensity" higher than the third quartile of the distribution (ID-related local labour systems must cover at least 59% of the provincial employment in the industry sector). In this case, there is only one province in the South as opposed to 26 in the Centre-North (about 40% of the provinces).

[TABLE 1 AND 2]

Useful information can be gathered from the ranking of provinces in terms of the various indicators (Table 3). Data cover the first and the last years of the time span so as to check the extent of the changes in the province ranking. With reference to value added, Milan is the richest province in the country. Unsurprisingly, among the top five provinces, three host major urban centers (Milan,

is predominantly made up of SMEs (see ISTAT 2001). The LLS is calculated by ISTAT and IDs have been identified by adopting the methodology used in Sforzi and Lorenzini (2002). Anyway, other classifications of IDs exist. On the one side, ID are individuated on the basis of administrative criteria. According to Regional Law 37/1991 and 140/1999, they are "an area characterized by a high territorial concentration of small firms with a particular productive specialization and a specific relationship between the firms and the resident population". On the other side, different sources (Il Sole 24Ore, Fondazione Edison, Unioncamere) suggest a methodology based on statistical data and field surveys. Anyway, the methodology followed by ISTAT remains the most reliable. It allows monitoring temporal evolution of statistical data and comparing the studies set on those data.

Bologna and Rome) and scant changes occurred over the years, at least with regards to the first three positions. The well-being ranking, however, presents some novelties. The province of Reggio Emilia takes the first position, followed by Prato, which ranked first in 2000, and then Modena. In fourth and fifth place, there are two provinces that are home to two major cultural cities, such as Venice and Florence.

When comparing value added and well-being rankings, the Modena province is the only one that is simultaneously among the top-scoring provinces, which confirms that the value added only partially gives an account of the well-being of a territory. Some differences can also be detected for bottom positions, but in this case the most interesting evidence is that they are all occupied by South provinces, in particular those belonging to Sicily and Calabria. Such a strong dualism is confirmed even for each well-being sub-index analysed.

It is also interesting to notice that "high ID provinces" tend to have higher well-being rankings. Such a result strongly emerges in the sub-indices of the "Competitiveness" and in part with regard to HDI and "Socio-institutional quality" indices. In addition, no "ID province" is at the bottom of the rankings, except for Foggia and Taranto which, however, have a very modest ID vocation. In any case, the differences between well-being and value added indicators are meaningful: the average "degree of district intensity" for the top 5 provinces (year 2007) is 0.27 and 0.65 respectively when value added and well-being rankings are looked at.

The descriptive framework therefore provides food for thought for an empirical analysis. First, through the measurement of well-being, a relatively better position "of ID provinces" emerges than that obtained according to the value added. Second, a divide is confirmed: Centre-North is richer than South even when using alternative indices.

[TABLE 3]

Information about initial levels and growth performances of the sub-indices are summarised in Table 4. On average, per capita value added increased by 3.4%, while growth performance in terms of well-being has been moderate (0.7%). Furthermore, some provinces show a negative well-being growth performance.

When sub-indices are compared, "Socio-institutional Quality" and HDI show the highest performances. On the contrary, "Equal Opportunities" grows moderately, while "Competitiveness" declines, although in these cases provincial disparities are very marked.

The correlation matrix of index growth rates (Table 5) completes the picture. What clearly emerges is that value added and well-being do not embody the same piece of information (in fact, the correlation is only 0.28). The correlation is high (0.34) between value added and HDI, while it is null between value added and "Socio-institutional Quality". When comparing the different well-being components, a particularly high correlation is detected between the well-being composite indicator and the "Equal Opportunities Index" (0.75), as well as with the HDI (0.50). As for the remaining cases, correlations are positive but moderate, as for "Socio-institutional Quality" (0.37) and "Competitiveness" (0.25). Finally, a positive correlation emerges between demographic and "Socio-institutional Quality" growth rates.

Overall, the descriptive analysis clearly shows that the various socio-economic growth measures at the province level do not lead to univocal assessments. When using the well-being instead of the value added indicator, differences in the dynamics emerge, which implies the possibility that such differences be reflected in terms of convergence and the evolution of geographical differences.

[TABLE 4 AND 5]

5. The model

The empirical analysis is based on the "beta" convergence approach, according to which each economy is expected to converge to a common equilibrium (the unconditional convergence hypothesis).[10] Such an approach requires an econometric model in which the hypothesis that lagging-behind provinces grow faster than rich ones.

Following Baumol (1986) and Barro and Sala-i-Martin (1991; 1995), beta convergence implies a negative empirical relationship, in our case between the growth rate of per capita value added, or of the well-being indicator, and its initial level. Formally:

$$\Delta \ln Y_{it} = a + b \cdot lnY_{it-1} + u_{it} \tag{10}$$

where i (= 1,. ..., N) indicates the provincial units, t (= 1, .. T) the year, and Y the per capita value added or the index of well-being and the other sub-component indices. The parameter a is the constant term, b captures the convergence effect, and u_{it} is the error term. The convergence condition requires that the first derivative of the coefficient b be negative, thus implying that poorer provinces are catching up.

Barro and Sala-i-Martin (1995) highlight the distinction between coefficient b and convergence speed (β), typical of the neoclassical approach. The convergence coefficient can be expressed as follows:

$$b = \frac{1 - e^{-\beta t}}{t} \tag{11}$$

where t is the number of years. The term β indicates the speed at which the provinces reach the common equilibrium value. Therefore, if b is negative then β is positive. The higher β is, the higher the speed of convergence is.

[10] The relatively short time period (2000–2007) suggests caution in the interpretation of the results. However, the equation must be considered as valid, given that the model is based on an approximation around the steady state and it is consequently supposed to capture the transition dynamics around the steady state (Durlauf et al. 1995; Islam 1995).

This formulation is used by Marchante and Ortega (2006). In our work, however, we bring two modifications: the provincial scale and the "degree of district intensity" as additional explanatory variables, which in fact changes the approach setting in that of "conditional" convergence. We have not considered the inclusion of other control variables for two reasons: the scant literature existing on well-being and convergence allow researchers to have a lot of arbitrariness in the choice, making comparisons difficult (Marchante and Ortega 2006); the introduction of additional explanatory variables could lead to problems of reverse causality (Signorini and Omiccioli 2002).

Along the lines of the empirical literature about IDs, the model requires that a dichotomous dummy (ID or not ID) or the "degree of district intensity" be included as explanatory variables. A statistically significant coefficient shows the presence of an "ID effect", of which the sign and intensity can be studied (Signorini and Omiccioli 2005). The main problem of the econometric analysis is that the coefficient might capture in the "ID effect" some local specificities which are not actually related to ID agglomeration economies. The convergence approach, through the inclusion of the initial level of the dependent variable (well-being or value added), captures the degree of local development, summarising the various factors that interact and affect the performance of the production system (Federico 2006). The equation can be expressed as follows:

$$\Delta \ln Y_{it} = a + b \cdot lnY_{it-1} + c \cdot ID_{it-1} + u_{it} \quad (12)$$

In this specification, the *b* coefficient now indicates whether there is a (conditional) convergence, once controlled for the ID nature of the territory (being expressed through a dichotomous or a continuous variable ID_{it}). In order to assess the impact of the ID-related control variable, the value of the coefficient *b* must be compared to that obtained in the standard specification. If, once controlled for the ID nature of the province, the (absolute value of the) coefficient *b* result is higher, then an ID effect positively affects the convergence speed of the province.

As hinted above, we used the "degree of district intensity" (a continuous variable, Equation 13a) to control for the ID nature of the province, and in order to verify the robustness of the results, we made additional estimations using alternative (dichotomous) indicators (Equation 13b). In this latter case, two dummies have been used in place of the "degree of district intensity": the first dummy (DIS) takes the value of 1 in the case of an "ID province", and 0 in the remaining cases. In order to take account of the possibly different intensity of the phenomenon, the second dummy (DIS_HIGH) takes the value of 1 in case of "highly ID province" (as previously defined). Hence, the models are formulated as follows:

(13a) $$\Delta \ln Y_{it} = a + b \cdot lnY_{it-1} + c \cdot DIS\_DEGREE_{it-1} + u_{it}$$

(13b) $$\Delta \ln Y_{it} = a + b \cdot lnY_{it-1} + c \cdot DIS_{it-1} + d \cdot DIS\_HIGH_{it-1} + u_{it}$$

Furthermore, a geographic dummy has been included which assumes a value of 1 if the province is located in the South, and 0 if it is located elsewhere, in order to verify whether any tendency to converge to different equilibria appears, and whether and how the ID effect appears in both macro-areas.

The econometric analysis is based on the WLS (Weighted Least Square) estimator, as it allows, by weighting the observations with demographic weights, to explain disparities with higher accuracy (Petrakos and Artelaris 2009; Kallioras 2010; Artelaris et al. 2011).[11]

Finally, similarly to other works in the literature, our study suffers from a certain degree of arbitrariness in the choice of the components of the well-being indicator. However, the use of an aggregate index, consolidated in the literature, partially reduces these problems and, taking into due account the differences among the methodological approaches followed, allows a comparison with Ferrara and Nistico (2013).

[11] Italian provinces show, in fact, big differences in terms of population size, which ranges from a minimum value of 58,000 to a maximum value of 3.7 million inhabitants.

The first results are summarised in Table 6. With reference to the per capita value added, there is evidence of an "unconditional" convergence. The coefficient is statistically significant and the speed of convergence is 1.4% per annum (column 1). When regressions are run separately for North-Centre and South provinces, convergence increases. As for the North-Centre provinces, the convergence speed is 4.1% per annum (column 3), while it is 3.3% per annum for South provinces (column 4). The phenomenon thus appears to be more marked locally than globally, even if the relatively lower performance of South provinces may imply the persistence of regional disparities. This hypothesis is supported by the results of the regression in which a dummy "South" is included (column 2). The coefficient of the variable is negative and, once introduced, the convergence speed increases. This result is in line with much of the evidence found in the literature about Italian regional divides (Paci and Saba 1997; Paci and Pigliaru 1997; Daniele and Malanima 2007).

When the analysis shifts to well-being instead of per capita value added, convergence is confirmed: indeed, the coefficient *b* is higher than the one obtained with the value added and the speed of convergence β amounts to 1.8% per annum (model 4), although the explanatory capacity of the model reduces (the R-squared decreases from 0.21 to 0.14). These results are in line with Marchante and Ortega's (2006), which find a greater trend to convergence when using quality of life in the Spanish regions. Interesting indications emerge when the model with well-being is tested at a "local" level: in contrast to the results of the regressions with the value added, in the well-being case unconditional convergence seems to emerge only among the provinces located in the Centre-North. The comparison with the regression related to the whole population of provinces shows a higher coefficient *b*, corresponding to a convergence speed of 3% per year. On the contrary, the values related to the South provinces are not statistically significant. The result obtained at the "global" level, therefore, is mainly influenced by the performance of the provinces located in the richer part of the country.

Our results do not stray from the evidence provided in Ferrara and Nisticò (2013), who find on the one hand that gaps tend to reduce when measured in terms of well-being (sigma

convergence), and on the other hand that the rank convergence analysis does not show any significant changes in the ranking. So the result is confirmed that South provinces show a greater attitude to converge with the rest of the country when per capita value added rather than well-being is considered.

In order to assess the existence of the ID effect, we include the "degree of district intensity" among the variables of the model. As already clarified, in fact, in this way we test a conditional convergence hypothesis.[12] The results are shown in Table 7. As a first consideration, the analysis highlights the lack of an ID effect when studying convergence measured by per capita value added. In the columns (8 and 9) the variable related to the IDs is not statistically significant. In column (8) the value of the coefficient b remains virtually unchanged compared to the "unconditional" version, which confirms a convergence speed of around 1.4% (the coefficient *b* in column 9 is not significant).

Therefore, there is no evidence that the ID nature of the province is a factor in any way capable of influencing economic growth or explaining territorial differences. These results are in line with the more recent literature on IDs, which shows that industrial districts have lost their capability of assuring growth plus (Foresti et al. 2009; Iuzzolino and Menon 2011; Piergiovanni et al. 2012).

However, column (10) shows an interesting association between the "degree of district intensity" and the growth of well-being. The coefficient of this variable is statistically significant at the 5% level and helps improve the explanatory power of the model (the R-squared increases). The coefficient *b* now assumes a significantly higher value (compared to column (4)), confirming the ID effect. The speed of convergence increases from 1.8% to 2.8% per annum. Similar considerations can be made when studying the relationship using ID dummies as controls (column 11). In this second specification of the model it is possible to note that "ID provinces" and "highly ID provinces" show a better growth performance.

[12] If the new control variable is statistically significant and the coefficient b has a higher value, this means that the "ID provinces" are characterised by higher convergence performances.

The adoption of the two dummies also affects the estimation of the convergence speed, which increases from 2.8% to 3.1%. These results confirm the presence of an ID effect.

[TABLE 6 AND 7]

In general, the picture derived in relation to provincial differences when well-being rather than value added is taken into account is quite different. The presence of an ID within the provinces contributes to explaining differences in local performances. This is new evidence in the empirical literature on the measurement of socio-economic convergence in Italy.

As in the previous set of regressions, the model has been tested by running separate regressions for Centre-North and South provinces (Table 8). With reference to the first macro-area, the analysis confirms a positive relationship between the "degree of district intensity" and well-being growth. Compared to the previous specification (without the ID control) the coefficient *b* increases, resulting in greater speed of convergence (from 3% to 4%); even the R-squared increases, proving a better explanatory power. The district effect is also confirmed with the use of the dummy; both statistics are significant (one 5% and the other 10%) and the speed of convergence is around 4.3%.

When turning attention to the South macro-area, the results are different and less supportive of the ID effect. Indeed the coefficient of the "degree of district intensity" is statistically significant (column 14) and shows a positive association with the dependent variable. Recalling that there are few ID provinces in the South (only 9 out of 31) and only one can be classified as "highly ID province", it is preferable to use a single dummy (DIS). In this case, the coefficient of the dummy is statistically not significant. According to these results, no territorial continuity seems to characterise the ID effect, to the extent that it appears almost exclusively concentrated in the macro-area of the Centre-North, where the convergence trend in well-being is stronger than in the South. Furthermore,

in contrast to the findings related to the value added, "local" convergence is weaker due to the weaker performance of South provinces.

The work thus confirms relevant differences in the results depending on the index through which the growth performance is measured. The findings follow a clear-cut direction: when the performance is measured in terms of value added, the role of IDs is underestimated, while the performance of the South provinces appears overestimated.

[TABLE 8]

In addition, we tested convergence by considering each sub-index composing the well-being composite indicator. This allows us to assess the ID effect distinguishing all the different dimensions of socio-economic growth (Table 9). A form of unconditional convergence characterises all the sub-indices but the "socio-institutional quality index" (the coefficient is statistically not significant). High performances are shown at the provincial level in particular by the "Equal Opportunities" and the HDI index; as for the "Competitiveness" sub-index, the related coefficient is lower, and lower as well is the speed of convergence.

Interesting information is obtained when the ID control is included in the regressions. Only in the case of HDI does there seem not to be any ID effect: the coefficient of the "degree of district intensity" is not statistically significant. In the specification with the dummies (column 18), a very small but statistically significant ID effect is associated with "highly ID provinces".

The other dimensions of well-being offer much more remarkable findings. Looking at the equal opportunities index, the "degree of district intensity" now becomes a decisive variable for explaining convergence. This evidence is reflected in higher values of both the coefficient *b* and the R-squared (columns 19 and 20). When we use the ID dummies, however, a positive and statistically significant relationship emerges only in relation to the "ID province" feature (the DIS dummy). Similar considerations characterise the study of convergence through the "Socio-institutional

Quality" index. In this case, moreover, the specification with ID controls significantly improves. The beta coefficient almost doubles, and the R-squared, which had a value close to zero, increases to 13% (columns 26 and 27). As regards the "Competitiveness" sub-index, the growth rate is predominantly influenced by the DIS_HIGH dummy (columns 23 and 24).

Ultimately, these analyses confirm the ID effect, with particular reference to the dimensions concerning the labour ("Equal Opportunities" index) and the socio-environmental ("Socio-institutional Quality" index) conditions. It seems that, when we disaggregate the index of well-being, the measurement of the ID effect through the "degree of district intensity" does not allow some peculiarities that indeed characterise the different specifications to be captured. As known, in fact, by construction this indicator embodies both dichotomous and quantitative information. Therefore, only through the specifications with the dummies it can be understood that the convergence in the "Equal Opportunities" as well as in the "Socio-institutional Quality" indices is related to the "ID province" characteristic, while the "highly ID province" is relevant in explaining the convergence in the HDI and in the "Competitiveness" index.[13] In other words, the differences in the performances can be explained by the mere presence of an ID in some cases, while for some other dimensions of well-being it is necessary that not only the ID be present, but also that it be sufficiently pervasive (the "highly ID provinces" are those for which the LLSs referable to an ID cover at least the 59% of the provincial employment in the industry sector).

[TABLE 9]

The analysis highlights that the presence of an ID is associated with better performances of the provinces expressed in terms of socio-economic welfare. These circumstances may explain certain peculiarities of the demographic growth within Italy. The available data allow, in fact, the determination of whether and to what extent the presence of an ID can explain population growth, according to the following specification:

[13] These results are confirmed even when the dummies (DIS and DIS_HIGH) are tested individually.

(14a) $$\Delta \ln POP_{it} = a + b \cdot \ln WELB_{it-1} + c \cdot DIS\_DEGREE_{it-1} + u_{it}$$

(14b) $$\Delta \ln POP_{it} = a + b \cdot \ln WELB_{it-1} + c \cdot DIS_{it-1} + d \cdot DIS\_HIGH_{it-1} + u_{it}$$

The results are summarised in Table 10. Looking at column 22, the coefficient of the initial level of well-being is positive and statistically significant, as well as the coefficient of the "degree of district intensity" (specification 14a). When we use the ID dummies (specification 14b), the results on the one hand confirm the positive relationship with the initial level of well-being, on the other hand show that only the "highly ID province" characteristic is statistically significant (column 23). In summary, the simple presence of an ID is not sufficient to affect the population growth dynamics. In fact, the ID effect pertains to provinces in which at least 59% of the workers in the sector industry are employed in IDs.

[TABLE 10]

6. Concluding remarks

The aim of this study was to explore the convergence between the Italian provinces over the period 2000–2007 and to test the possible role of industrial districts.

The results confirm convergence both in the per capita value added and in well-being. But when we control for the ID characteristic in the model, the ID effect shows only in the latter case and seems to be more relevant in explaining the convergence between the provinces of the Centre-North (the richest areas of the country), even with reference to the sub-indices representing the different dimensions of well-being. In contrast, the South provinces of the country, considered separately from the rest, show a diverging trend.

The use of well-being indicators, therefore, provides a snapshot of regional disparities which is different from that obtained through traditional measures. In light of this, the hypothesis of a

reduced importance of the role of IDs within the national system needs to be reconsidered. Our results, in fact, indicate that the ability to detect an ID effect depends on the indicator that is used to measure the growth performance. If it is confirmed that per capita value added does not provide any evidence in this direction, an ID effect clearly emerges when well-being is considered. Hence, the interesting question is not just the validity of the ID model in itself, but: what are the indicators through which IDs' role and state of health are highlighted.

Our findings contribute to the literature on IDs and on local production systems in different ways. They suggest that studying the evolution of the provinces in terms of GDP or per capita value added does not allow a full understanding of the processes of convergence, nor of the contribution of IDs to regional development. IDs seem, in fact, to be generating a social dividend that the traditional literature, focused on the link between ID and economic growth *strictu sensu*, overlooks.

In other words, the "local milieu", in addition to the external economies which the traditional literature on IDs has often focused on, could also ensure social benefits. But while the former are no longer able to generate an advantage in terms of competitiveness and growth for the ID provinces, the latter seem to have a remarkable role. In addition, "highly ID provinces" appear to be more attractive in terms of population growth. Were this attractiveness depending on the better socio-economic performance of the provinces, the circumstance would help explaining the lack of convergence in per capita value added (the increase in the total value added generated in the area due to the ID effect would be offset by an increase in the resident population).

With regard to policy implications, it must be taken into account that much of the orthodox literature explained the vitality of IDs by evoking external economies related to the so called "industrial atmosphere", due to the peculiar interrelation between the social and production dimensions of the territory. Becattini's, Sforzi's and many other authors' approaches pointed in this direction along the lines of the Marshallian view. The virtuous cycle on the basis of which the social system produced externalities in favour of the production system seems to have lost relevance. The speed of convergence measured in terms of GDP and value added of IDs is not significantly

different from those of non–ID areas. The fact that ID provinces converge more rapidly in terms of well-being suggests that the virtuous circle might be operating the other way around: the production system produces external effects on the social system. The "social dividend" of the districts, however, appears more clearly in the Centre-North of the country than in the South. This means that the presence and the reinforcement of ID systems are not sufficient to make the difference in the territories characterised by backward social and institutional initial conditions. The districts operate as an engine of well-being in socially mature contexts. Therefore, the effectiveness of the policies for IDs is related to the life cycle and to the initial conditions of local communities.

These considerations on the one hand open up new scenarios for future research (the investigation into the ways through which the production characteristics of IDs produce external effects on well-being, in fact, has mainly characterised sociology and economic geography studies), and on the other hand imply a revision of the philosophy underlying industrial policies for IDs, as well as of their targets. The payoff of the policies aimed at consolidating IDs mainly has a socio-economic nature. Through these policies, governments (at different levels) pursue the development of the territory towards better social conditions, higher institutional quality and towards a reduction in public welfare needs (e.g. the support of equal opportunities). Policies in favor of IDs, therefore, are disentangled from their traditional conceptual environment and in fact become socio-economic policies. Within this context they should be redesigned.

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Table
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Table 1 – Degree of district intensity in the Italian provinces

	Obs.	Mean	Std. Dev.	Min	Max
Italy	107	0.2872897	0.3596921	0	1
Centre-North	67	0.4335821	0.3690311	0	1
South	40	0.0422500	0.1510898	0	0.93

Source: Authors' calculation on ISTAT data.

Table 2 – "ID provinces" in Italy

	Italy	Centre-North	South
ID provinces	66 (61.68%)	57 (85.1%)	9 (22.5%)
Highly ID provinces	27 (25.23%)	26 (38.8%)	1 (2.5%)

Source: Authors' calculation on ISTAT data. Percentages on macro-area totals in parentheses.

Table 3 – Ranking of Italian provinces (best and worst 5 for each indicator; "degree of district intensity" in parentheses)

PCVA index		**Well-Being**		**Hdi**	
2000	2007	2000	2007	2000	2007
Milan (0.28)	Milan (0.28)	Prato (1.00)	ReggioEm(0.98)	Prato (1.00)	ReggioEm(0.98)
Bologna (0.11)	Bologna (0.11)	Pordenone(0.15)	Prato (1.00)	ReggioEm(0.98)	Modena (0.96)
Modena (0.96)	Modena (0.96)	Reggio Em(0.98)	Modena (0.98)	Modena(0.96)	Rimini (0.11)
Parma (0.86)	Bolzano (0.03)	Modena (0.96)	Venezia (0.06)	Forlì (0.59)	Prato (1.00)
ReggioE (0.98)	Rome (0.00)	Venezia (0.06)	Firenze (0.25)	Rimini (0.11)	Latina (0.00)
Vibo Val. (0.07)	Carbonia(0.00)	Reggio Cal. (0.00)	Vibo Val. (0.07)	Catanzaro (0.0)	Potenza (0.0)
Crotone (0.00)	Foggia (0.07)	Catanzaro (0.0)	Cosenza (0.0)	Agrigento (0.0)	Catanzaro (0.0)
Enna (0.00)	Crotone (0.00)	Cosenza (0.0)	Catania (0.0)	Benevento (0.06)	Messina (0.0)
Agrigento(0.00)	Agrigento(0.00)	MedioCamp (0.0)	Messina (0.0)	Cosenza (0.0)	Benevento (0.06)
MedioCamp(0.00)	MedioCamp(0.00)	Agrigento (0.0)	Agrigento (0.0)	MedioCamp (0.0)	Cosenza (0.0)
Equal opportunities index		**Competitiveness index**		**Socio-institutional quality index**	
2000	2007	2000	2007	2000	2007
Pordenone (0.15)	Bolzano (0.11)	Prato (1.00)	Lecco (1.00)	Venezia (0.06)	Venezia (0.06)
Belluno (0.26)	PesaroUrb (0.94)	Vicenza (0.93)	Vicenza (0.93)	Pisa (0.32)	Verbania (0.40)
Prato (1.00)	Udine (0.33)	Novara (0.53)	Lodi (0.74)	Cremona (0.95)	Padova (0.99)
Bolzano (0.03)	Firenze (0.25)	Lecco (1.00)	Prato (1.00)	Verbania(0.40)	Cremona (0.95)
Firenze (0.25)	Terni (0.02)	Treviso (0.98)	Reggio Em (0.98)	L'Aquila (0.01)	Torino (0.05)
Latina (0.0)	Foggia (0.07)	Catanzaro (0.0)	Reggio Cal (0.0)	Reggio Cal (0.0)	Taranto (0.12)
Siracusa (0.0)	Caserta (0.0)	Imperia (0.0)	Palermo (0.0)	Taranto (0.12)	Reggio Cal (0.0)
L'Aquila (0.01)	Agrigento (0.0)	Reggio Cal (0.0)	Oristano (0.0)	Catanzaro (0.0)	Vibo V. (0.0)
Caltanisetta (0.0)	Carbonia(0.0)	Oristano (0.0)	Imperia (0.0)	Agrigento (0.0)	Catania (0.0)
Agrigento (0.0)	Matera (0.0)	Rome (0.0)	Rome (0.0)	Brindisi (0.0)	Agrigento (0.0)

Source: Authors' calculation on ISTAT data.

Table 4 – Descriptive statistics

	Obs	Mean	Std. Dev.	Min	Max
GVAG	107	3.422779	0.9244221	1.516438	5.822077
GWEB	107	0.6961368	0.312757	–0.4808686	1.766389
GHDI	107	0.4115125	0.1693673	–0.0808407	1.303368
GEQUAL	107	0.6185427	1.653785	–5.479221	4.57806
GCOM	107	–0.3418067	1.148438	–2.840898	3.152419
GSOCQUAL	107	4.016789	1.575757	0.0055374	9.270592
GPOP	107	0.0051368	0.0050716	–0.004294	0.017722
LVAG	107	9.727473	0.2897144	9.083552	10.28886
LWEB	107	0.5577584	0.0327942	0.4884759	0.6462165
LHDI	107	0.8256713	0.0255572	0.7624079	0.8893616
LEQUAL	107	0.4485073	0.0643341	0.3164531	0.6470601
LCOM	107	0.1714312	0.0636337	0.0710288	0.3178751
LSOCQUAL	107	0.2495981	0.0557755	0.1627079	0.6081764
LPOP	107	532.1701	602.1503	58.7	3705.5

Note: VAG – per capita value added; WEB – well-being index; HDI – Human Development Index; EQUAL – Equal Opportunities Index; COM – Competitiveness Index; SOCQUAL – Socio-institutional Quality Index; POP – Population. The G prefix denotes growth rates, while the L prefix expresses initial values.

Table 5 Correlation among growth rates (2000–2007)

	GVAG	GWEB	GHDI	GEQUAL	GCOM	GSOCQUAL	GPOP
GVAG	1						
GWEB	0.2831	1					
GHDI	0.3472	0.5008	1				
GEQUAL	0.2451	0.2554	0.0604	1			
GCOM	0.1563	0.7505	0.3452	0.1206	1		
GSOCQUAL	–0.0747	0.3777	0.0206	–0.0593	–0.2714	1	
GPOP	–0.3085	–0.1659	–0.3316	–0.0760	–0.3331	0.1268	1

Source: Authors' calculation on ISTAT data.

Table 6 – Unconditional beta convergence (2000–2007): WLS estimator[1]

	(1) PCVA	(2) PCVA	(2) PCVA (CN)	(3) PCVA (SOUTH)	(4) WELB	(5) WELB	(6) WELB (CN)	(7) WELB (SOUTH)
b	–0.0142909 (0.0024129)***	–0.0433671 (0.0037498)***	–0.0473444 (0.0049562)***	–0.0366488 (0.0050078)***	–0.0192174 (0.0053069)***	–0.030872 (0.0076051)***	–0.0335527 (0.0087928)***	–0.0234523 (0.0143054)
Dummy SOUTH	-	–0.0205308 (0.0023987)***	-	-	-	–0.0018688 (0.0008101)**	-	-
F stat.	35.08	69.79	91.25	53.56	13.11	8.91	14.56	2.69
Rsquared	0.2102	0.5365	0.5862	0.4421	0.1399	0.1778	0.2014	0.0745
n. obs.	107	107	67	40	107	107	67	40
β	1.4%	3.8%	4.1%	3.3%	1.8%	2.8%	3.0%	

Source: Authors' calculation on ISTAT data. Corrected standard errors in parentheses.
**** significant at 1%; ** significant at 5%; * significant at 10%*

[1] In Table 5, as well as in other Tables of the present work, the value of the constant is not included, since it is not so relevant in this kind of analysis. The test of the convergence hypothesis, in fact, is based on the comparison of the values assumed by the coefficient *b* in the various specifications.

Table 7 – Conditional beta convergence (2000–2007): WLS estimator

	(8) PCVA	(9) PCVA	(10) WELB	(11) WELB
B	–0.0140415	–0.0156699	–0.0304513	–0.0349021
	(0.0026986)***	(0.0033604)	(0.0079874)***	(0.0082579)***
DIS_DEGREE	–0.0003585	-	0.0026659	-
	(0.0021884)		(0.0011481)**	
DIS	-	0.001207	-	0.0015972
		(0.002486)		(0.0007465)**
DIS_HIGH	-	0.0001534	-	0.0015499
		(0.00176)		(0.0007881)*
F stat.	17.60	12.87	7.92	6.14
R-squared	0.2128	0.2128	0.1926	0.2147
n. obs.	107	107	107	107
β	1.3%	1.5%	2.8%	3.1%

Source: Authors' calculation on ISTAT data. Corrected standard errors in parentheses.
**** significant at 1%; ** significant at 5%; * significant at 10%*

Table 8 – Conditional beta convergence (2000–2007): WLS estimator

	(12) WELB (Centre-North)	(13) WELB (Centre-North)	(14) WELB (SOUTH)	(15) WELB (SOUTH)
b	–0.0465478	–0.050889	–0.0326617	–0.0268134
	(0.0117807)***	(0.0115166)***	(0.0147256)**	(0.0149485)***
DIS_DEGREE	0.002594	-	0.0055131	-
	(0.0012834)**		(0.0018765)***	
DIS	-	0.0017913	-	0.0009221
		(0.0008873)**		(0.0011071)
DIS_HIGH	-	0.0016878	-	-
		(0.0008556)*		
F stat.	8.86	6.69	4.40	1.63
R-squared	0.2658	0.2947	0.1476	0.0925
n. obs.	67	67	40	40
β	4.0%	4.3%	2.9%	2.4%

Source: Authors' calculation on ISTAT data. Corrected standard errors in parentheses.
**** significant at 1%; ** significant at 5%; * significant at 10%*

Table 9 – Conditional beta convergence (2000–2007). WLS estimator

Coeff.	*HDI*			*Equal opportunities*		
	(16)	(17)	(18)	(19)	(20)	(21)
b	–0.0354166	–0.0385106	–0.0383205	–0.0622408	–0.0742885	–0.0823526
	(.0049145)***	(.006473)***	(.0064996)***	(.0105399)***	(.0120689)***	(.0124374)***
DIS_DEGREE	-	0.0004745	-	-	0.0101535	-
		(0.000425)			(.0043322)**	
DIS	-	-	–0.0001312	-	-	0.0089583
			(0.0002998)			(.0032284)***
DIS_HIGH	-	-	0.0005502	-	-	0.0038547
			(0.003011)*			(.0035848)
R-squared	0.4458	0.4534	0.4610	0.2944	0.3335	0.3702
	Competitiveness			*Socioistituzional quality*		
	(22)	(23)	(24)	(25)	(26)	(27)
b	–0.0155156	–0.0230949	–0.0201687	–0.0118903	–0.0208229	–0.0244561
	(0.002846)***	(.0044779)***	(.0044118)***	(0.0080856)	(.0074238)***	(.0075548)***
DIS_DEGREE	-	0.0111656	-	-	0.0140265	-
		(.0036653)***			(.0034713)***	
DIS	-	-	–0.0008567	-	-	0.0090578
			(.0025492)			(.0034886)**
DIS_HIGH	-	-	0.0079568	-	-	0.0049827
			(.0024432)***			(.003265)
R-squared	0.2867	0.3446	0.3469	0.0228	0.1167	0.1345

Source: Authors' calculation on ISTAT data. Corrected standard errors in parentheses.
**** significant at 1%; ** significant at 5%; * significant at 10%*

Table 10 – Relationship among "degree of district intensity", well-being and population growth (2000–2007)

Var. dependent: population rate growth	(22)	(23)
lnWELB	0.0812561	0.0498907
	(0.0121996)***	(0.0080655)***
DIS_DEGREE	0.0030098	-
	(0.0012288)**	
DIS	-	–0.0000871
		(0.0010842)
DIS_HIGH	-	0.0020881
		(0.0008893)**
F stat.	64.48	45.28
R-squared	0.4906	0.4920
n. obs.	107	107

Source: Authors' calculation on ISTAT data. Corrected standard errors in parentheses.
**** significant at 1%; ** significant at 5%; * significant at 10%*