Regional convergence and public spending in Italy. Is there a correlation?

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Abstract. The aim of this paper is twofold. Firstly, it examines the evolution of regional disparities among the Italian regions during the period 1980-2007. Secondly, the paper analyses the relationship between public spending and regional productivity growth. This analysis is based on the Regional Public Accounts (RPA), a detailed database which measures public financial flows at the territorial level for the period 1996-2006. Results show how the process of both σ and β convergence has mainly concerned labour productivity, while the convergence in per capita GDP has been very weak. The impact of public spending has been different, depending on the expenditure categories and the regions considered. While in the more developed regions of the Northern area of Italy we found a positive correlation between capital expenditure and growth, in the less developed Mezzogiorno the correlation was found only for current expenditure.

1. Introduction

In spite of decades of public policies, the regional imbalances in economic development that historically characterised Italy still remain profound. An ample literature shows, in fact, how regional disparities in real per capita GDP and productivity fell primarily during the Sixties, remaining stable in the subsequent period. Only in recent years — in particular during the second half of Nineties – a process of convergence has taken place. Nevertheless, for the persistence and magnitude of the North-South gap, Italy stands out among the European countries.

The objective of this paper is twofold. Firstly it offers some up-to-date empirical evidence on the evolution of regional disparities. The analyses, based on the standard tests of σ and β-convergence, use a recent dataset relative to the period 1980-2007. A panel data technique is used to examine both absolute and conditional convergence. Secondly, the paper focuses on the role of public spending in the convergence process. This analysis is based on a detailed dataset that offers data for different categories of public expenditure flows at the regional level for the years 1996-2006.

In the period we have examined, the Italian policies for regional development underwent a profound change. In 1992 the long experience of the "Extraordinary Intervention Policy" for the development of *Mezzogiorno*[1] begun in the Fifties ceased, and the so-called "new regional development policy" gradually began: a phase of intervention different from that previous, both in method and for the instruments used. Formulated in the context of the EU's policy framework, and characterised by a bottom-up approach, based on a multi-level governance system, the new intervention policy has the objective of improving the conditions of the socio-economic context of the less developed regions, in order to promote endogenous growth and to attract resources from other territories.

At a distance of more then ten years from its commencement, the evaluation of the results obtained by the new development policy has brought different, often opposing, interpretations. According to some scholars (Rossi, 2004; Atella, 2004), and to a large part of public opinion, the new development policy would have substantially failed in its objective to reduce the

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[1] The list of regions is reported in the appendix.

gap between the North and the South, being characterized by great waste and inefficiency in the use of public resources. According to others, however, this policy would have gained valuable results, nevertheless some limitations primarily derive from the lack of resources actually available for the less developed regions (Viesti, 2009). In the light of this debate, the analysis of convergence and the distribution of public spending can offer some empirical evidence on the evolution of regional disparities and some policy implications

The paper is structured in three main sections. The first contains an analysis of the convergence process for the period 1980-2007. The second section examines the distribution of public expenditure and the relationships between different categories of expenditure (current, capital, development) and productivity growth. Some conclusive remarks follow.

Our analysis shows how, in the period examined, the regional convergence in productivity was significant, while that in per capita GDP was very low. Compared to the great difference in development between North and South, the territorial distribution of public spending has not favoured the less developed regions. Data show how public spending for development, measured in per capita terms, received by the regions of the Mezzogiorno, has been less than that of the Centre-North. Such evidence does not allow us to uphold the theory that the distribution of public resources would have favoured the Southern regions. Differences in favour of the Mezzogiorno are obtained, in fact, only if the expenditure is calculated as a share of GDP. Considering the regional distribution of public expenditure for development, no correlation was found between spending flows and regional growth. If the regions of the North are examined separately to the those of the South, differences in the links between public spending and productivity growth can be noted, however. In the first group of regions a significant, positive relationship between expenditure for development and growth can be found; in the Southern regions however, such a link concerns only current spending.

2. Convergence or divergence?

2.1. The evolution of regional disparities

The literature on convergence among Italian regions is very ample[2]. The main results of the studies show how the regional

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[2] See, for example, Paci e Pigliaru (1998); Terrasi (1999); Ciriaci (2001); Vamvakidis (2003); Maffezzoli (2006); Magrini (2007); Daniele (2008).

disparities in per capita GDP and productivity significantly decreased during the period 1960-73 while, in the subsequent decades it remained stable or, in certain phases, increased. Only in recent years, notably during the second half of the 1990s, has a convergence in productivity and, to a lesser extent in per capita GDP, taken place. For our analysis we benefited from the recent reconstruction of official Italian regional accounts[3] that provide a detailed time-homogeneous series for the period 1980-2007 allowing us to offer up-to-date evidence on the regional divide. In the 27 years considered, the rate of GDP growth in the Mezzogiorno was lower than in the Centre-North; in particular, the difference was around one half point per annum during the period 1980-96, while in the subsequent years the growth has been substantially the same (Tab. 1).

Tab. 1. GDP rate of growth 1980-2007

	1980-2007	1980-1996	1996-2007
Mezzogiorno	1.4	1.5	1.4
Centre-North	1.8	2.0	1.5

Source: Calculation on *Regional economic accounts*, Istat.

In the considered period, the North-South development gap became wider. Up to the middle of the 1990s, the gap continuously increased: in 1995, the difference in the level of per capita GDP between North-South is analogous to that recorded in the early Sixties. In the subsequent period, there has been a phase of catching-up: in per capita terms, the rate of growth of the Mezzogiorno is higher than that of the Centre-North. This has happened both because of the acceleration in GDP growth, and for the different demographic dynamics that affect the two areas: the net migration recorded, on average, in the South sustains the growth of per capita GDP. Nevertheless, this brief phase of catching-up has not been able to bridge the gap between the two areas: in 2007, the per capita GDP of the Mezzogiorno was around 59% of the rest of the Country. The regional imbalances are still profound.

[3] Istat, *Conti economici regionali*, 2005 and 2007.

Fig. 1. GDP per capita of the Mezzogiorno as a percentage of Centre-North
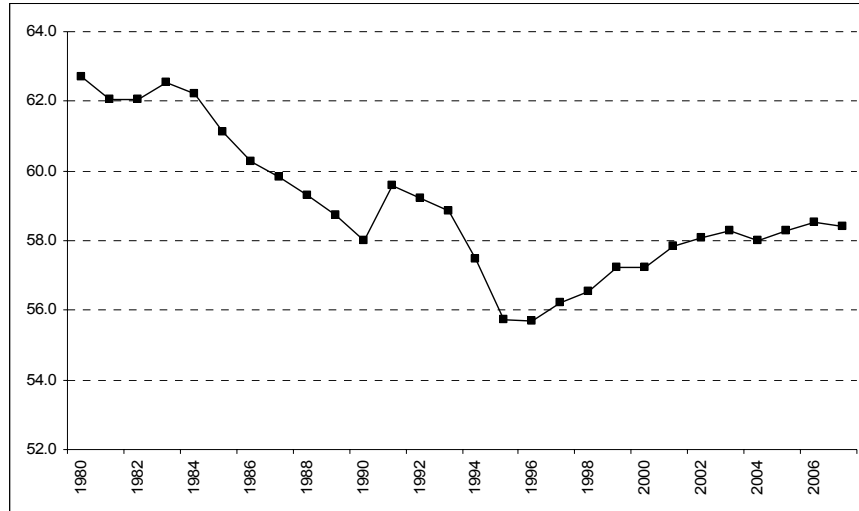
Source: Calculations on Istat, *Regional Economic Accounts*.

The evolution of regional disparities can be examined through the σ-convergence analysis, based on the observation of the cross-sectional dispersion of GDP per capita or per worker. A decrease of the degree of dispersion of the distribution, measured through the variance of the log of the selected variable, suggests the existence of a convergence process. Fig. 2 shows how the variance of per capita GDP increased during the period 1980-95, in which a phase of divergence occurred. A slight reduction can be observed for the subsequent years. Overall, the degree of dispersion remains roughly the same.

Fig. 2. Variance of per capita GDP among Italian regions
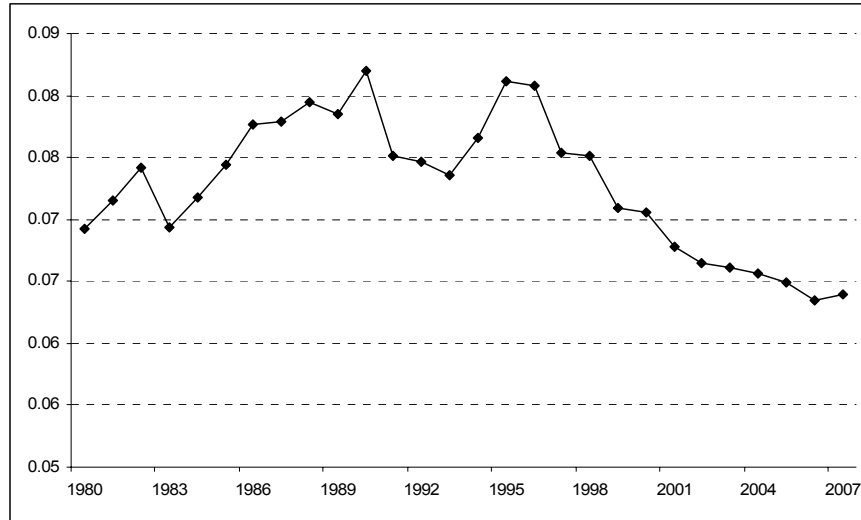
Source: Calculations on Istat, *Regional Economic Accounts*.

From an analytical point of view, the decomposition of per capita GDP in its main components can offer an explanation of "proximate causes" that determine σ-convergence or divergence. Starting from the basic identities:

$$\frac{Y}{P} = \frac{Y}{E} \times \frac{E}{P}$$

in which *Y* is the regional GDP, P is the population and E the number of employees, transforming the eq. 1 in log and applying the variance operator to both members, one obtains:

$$var\left[ln(Y\,/\,P)\right] = var\left[ln(Y\,/\,E)\right] + var\left[ln(E\,/\,P)\right] +$$
$$+2\,cov\left[ln(Y\,/\,E),ln(E\,/\,P)\right]$$

that shows how the variability of per capita GDP depends on the variance of labour productivity, on the employment rate and their co-variance. From this equation it derives that regional convergence in per capita GDP occurs if the variance in its factorial components decreases Fig. 3 shows how the divergence recorded for the period 1980-95 can be attributed to an increase in the regional rates of employment disparities. Furthermore, it is possible to observe a decrease in the variance of labour productivity that reveals a convergence process: the combination of these effects determines the "invariance" – or non-convergence - of the regional distribution of per capita GDP.

Fig. 3. Variance of labour productivity and employment rate
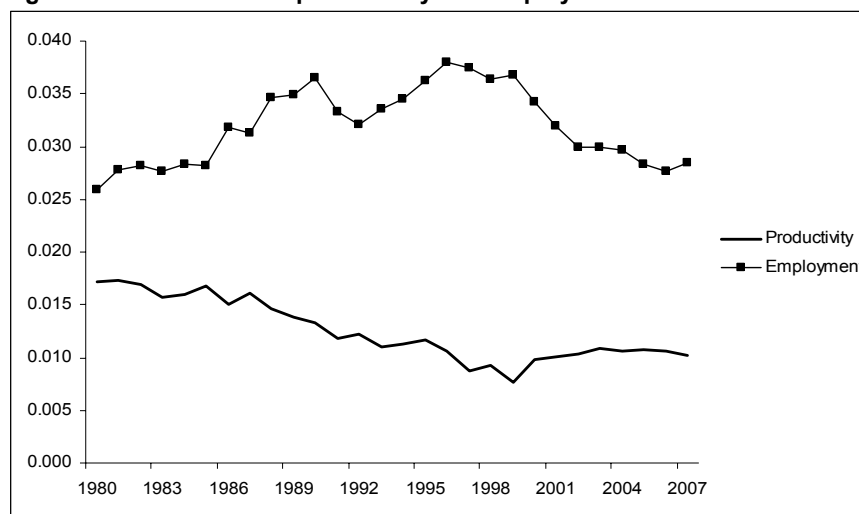
Source: Calculations on Istat, *Regional Economic Accounts*.

2.2. Absolute and conditional convergence

Methodology and data

A different concept of convergence, derived from the neoclassical model of growth (Solow, 1956), is that of absolute β-convergence, according to which the rate of growth of an economy is inversely correlated with its level of development. The basic hypothesis is that all the economies of the considered sample have the same structural parameters — the same "production function" — differing solely for the per capita capital stock (Barro e Sala-i-Martin, 1998).

The hypothesis of absolute β-convergence can be easily tested trough a scatter plot displaying the partial correlation between the rate of growth and the initial level of development of the economies. Fig. 4, provides an illustration for GDP per capita, showing the absence of correlation: the regions lagging behind didn't grow faster than the developed ones. Fig 5, referring to labour productivity, shows the existence of a significant and negative correlation (R^2 = 0,45) between the initial level and the subsequent rate of growth, consistent with the hypothesis of absolute β-convergence. Coherent with the results of much literature, and with the previous analysis of σ-convergence, these results suggests that the Italian regions have seen a significant convergence in productivity but not in terms of GDP per capita.

Fig. 4. GDP per capita convergence 1980-2007
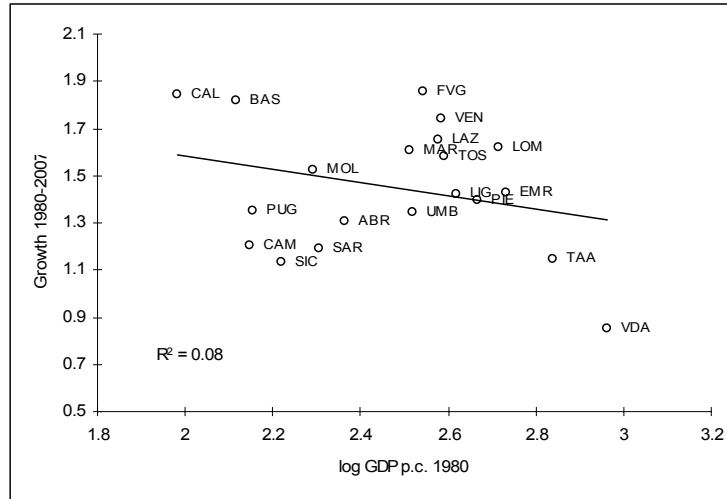
Fig. 5. GDP per worker convergence 1980-2007
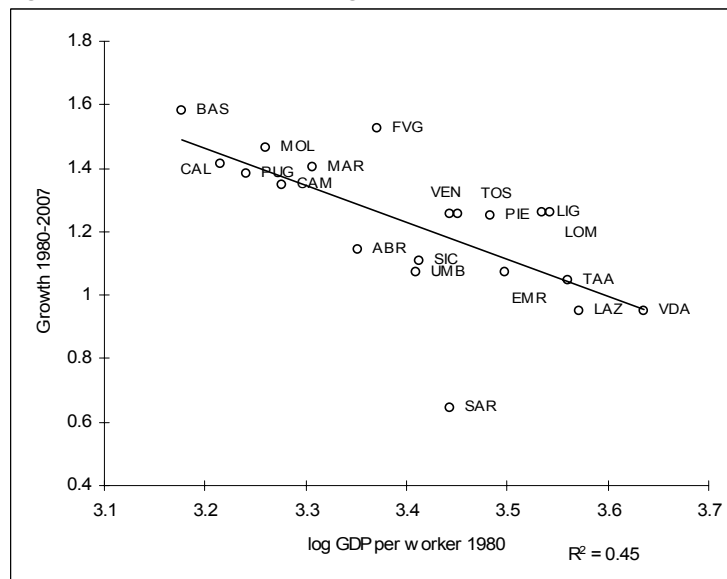
If one removes the hypothesis that all the economies share the same fundamentals, and consequently the same position in the steady state of growth, the concept of absolute β-convergence is modified into that of conditional convergence. According to this concept, an economy growth is as fast as it is distant from its position in the steady state (Barro e Sala-i-Martin, 1998). The existence of conditional convergence can be verified by estimating an equation of the form:

$$\left(\ln y_{i,T} - \ln y_{i,t}\right)\frac{1}{T} = \alpha_i + \beta_1 y_{i,t} + \beta_2 \mathbf{X}_{i,t-1} + \varepsilon_{i,t} \qquad\qquad (2)$$

with: $\varepsilon_{i,t} = \lambda_i + u_{i,t}$.

in which the dependent variable is the rate of growth of per capita (or per worker) GDP, $y_{i,t}$ the log of the same variable in the region i at time t, $\varepsilon_{i,t}$ a random disturbance and $\mathbf{X}_{i,t-1}$ a set of variables that captures the "fundamentals" of the economy, that is, all those characteristics that have a permanent effect on its growth rate.

To analyse the convergence among the Italian regions, we used a balanced panel which referred to the period 1980-2007, in which the rate of growth (the dependent variable) is for five-years. The use of panel data offers several advantages; the first, and most obvious, is that the number of observations increases. There are, nevertheless, some econometric reasons. Studies show in fact, how the cross-section analysis of convergence suffers from a downward bias of the convergence coefficient. The reason is that the steady state of an economy is affected by a number of factors that are unlikely to be considered, so neglecting that the steady state conditional factors lead to an omitted variable bias of estimations. These regional-specific unobservable factors can be modelled using panel data (Islam, 1998, 2003; Tondl, 2001; Durlauf et al., 2005).

The variables potentially correlated with regional economic growth are numerous. To select the variables to be included in the regressions, we have considered the results obtained in empirical research on the determinants of growth. In particular we referred to recent studies that employ the Bayesian approach to check the robustness of the explanatory variables used in the cross-section studies on economic growth (Doppelhofer et al, 2000, Fernández et al. 2001). In a study referring to the Spanish case, León-Gonzàlez and Montolio (2004), using the Bayesian technique, found that the initial level of per capita GDP and some types of private and public investment are strongly related to growth. Other variables, such as human capital proxies and the sectoral composition of production — measured by the relative share of agriculture and industry product — have a relatively high inclusion probability. On the basis of these studies, we included in the model we estimated the subsequent control variables: the share of gross fixed investment on regional GDP (Investment); the share of public sector

expenditure for final consumption on GDP (Public exp.); a proxy of human capital, given by the average number of years of schooling for each region (School); the shares of agricultural (Agriculture) and industrial (Industry) employment in total regional employment. Data on regional GDP, investment, public expenditure and employment are derived from the Regional accounts database published by Istat (2005; 2007), while the years of schooling are calculated on the basis of estimation contained in Ciccone (2004).

Estimations results

Tab. 2 reports the estimation results for the per capita GDP regressions. In column (1) the basic model for absolute convergence shows a negative correlation between growth and the initial level of per capita GDP, but the significance is very low. If we include the other variables the explicative power of the model increases and the test of diagnosis for panels improves. It is possible to observe that the share of investment on GDP is not correlated to regional growth, while the share of public spending has a positive relationship. The correlation between the agricultural share and growth is both negative and significant. As expected, the years of schooling are strongly and positively correlated to growth. The nature of data – referred to regions – leaves little room for doubt as to which model to use: that with fixed effect is the most appropriate in this case. This is confirmed by the standard test for diagnosis, that is the F test and the Hausman test statistic, whose values show how the fixed effect is consistent and to be preferred to both the OLS and random effects models.

Tab. 2. Convergence in per capita GDP 1980-2007

	(1)	(2)	(3)	(4)
const	0.281**	0.212**	0.2901**	0.7288**
	(7.46)	(2.64)	(2.61)	(3.609)
Log GDP pc	-0.027**	-0.026**	-0.032**	-0.09338**
	(-7.06)	(-3.98)	(-4.33)	(-3.506)
Investment		-0.073	-0.024	-0.02567
		(-1.48)	(-0.42)	(-0.4298)
Public Exp.		0.314**	0.307**	0.2123*
		(3.06)	(2.641)	(1.744)
Agriculture			-0.02967**	-0.01658
			(-3.310)	(-1.132)
Industry			-0.02542	0.001773
			(-0.7706)	(0.0686)

	(1)	(2)	(3)	(4)
School				0.07044**
				(2.216)
F	1.10	1.96	2.25	2.78
	0.36	0.02	0.00	0.00
Hausman	12.00	29.04	36.31	46.75
	0.00	0.00	0.00	0.00
n	100	100	100	100
Adj. R^2	0.0518	0.1965	0.2255	0.2857
lnL	338.640	348.201	351.355	356.072

Fixed effects model. T-statistics in parentheses; for F and Hausman tests p-value are reported in squared parentheses; * indicates significance at the 10 percent level; ** indicates significance at the 5 percent level.

Tab. 3. Convergence in labour productivity, 1980-2007

	(1)	(2)	(3)	(4)
const	0.4441**	0.3439**	0.3260**	0.8727**
	(13.67)	(4.828)	(5.183)	(4.455)
Log productivity	-0.04115**	-0.03868**	-0.03531**	-0.1036**
	(-13.27)	(-6.790)	(-7.274)	(-4.125)
Investment		-0.07605	-0.1163*	-0.0637
		(-1.191)	(-1.851)	(-0.9225)
Public exp.		0.4313**	0.4106**	0.3726**
		(4.468)	(4.661)	(3.941)
Agriculture			0.02376**	0.0194
			(2.181)	(1.518)
Industry			-0.01252	0.0128
			(-0.3786)	(0.4108)
School				0.07210**
				(2.479)
F	0.67	2.37	2.60	3.23
	0.88	0.00		
Hausman	6.44	71.67	47.56	61.92
n	100	100	100	100
Adj. R^2	0.1360	0.3822	0.3957	0.4462
lnL	336.215	354.273	356.694	361.723

Fixed effects model. T-statistics in parentheses; for F and Hausman tests p-value are reported in squared parentheses; * indicates significance at the 10 percent level; ** indicates significance at the 5 percent level.

Tab. 3 reports the results of regressions for GDP per worker. The correlation between the log of the initial level and growth is both strong and negative, suggesting the existence of both absolute and conditional convergence in the productivity levels. The share of public spending has a significant positive relationship to growth, such as the years of schooling, while investment and the share of industrial employment do not result as significantly correlated. The explicative power of the model is higher than that for per capita GDP. Even in this case both the F test with a low p-value (except for specification 1), and the Hausman test values show how the fixed effects model is consistent.

3. Public spending and regional growth

In this section the analysis focuses on the relationship between public spending and regional growth. The period we examine is that between1996-2006, for which we have detailed data for different flows of public expenditure at the regional level. These data are taken from the Regional Public Accounts (RPA), a detailed database, published by the Italian Ministry for the Economy, which measures public financial flows at the territorial level. The RPA database can be used to analyse different two reference universes: general government and the "public sector" which includes general government plus enterprises subject to the direct or indirect control of public entities (De Luca et al. 2005). For each macro-category of expenditure series for individual spending chapters are available: for instance the expenditure for development categories contains different capital expenditure categories. For the high degree of disaggregation, RPA accounts constitute a complete dataset for measuring and evaluating public policies at the regional level (Uval, 2007).

The construction of RPA was started in the mid 1990s, a period in which the system of Italian regional policies underwent radical transformation. In 1992 the long phase of "Extraordinary Interventions" for the development of the *Mezzogiorno* ceased, a phase that, since the early 1950s, had constituted the framework within which the measures for less developed areas were implemented. During the second half of the Nineties, the so-called "new development policy" defined in coherence with the European Union regional policy frame began. Characterised by a bottom-up approach, based on a multi-level governance system (EU, national and local), the new policy has the objective of improving the conditions of the socio-economic context of less developed regions, in order to promote endogenous growth and to attract

resources from other territories (Loddo, 2004). The policy instruments used are different. In particular there are some instruments included in the "Negotiating planning" such as Territorial Pacts for local development, Planning contracts for industrial investments and Area contracts for the implementation of new business initiatives in some circumscribed areas, in particular those facing employment crises. To these instruments, incentives and subsidies for investments (provided through the financial incentive scheme in which the main instrument is the law no. 488/92) and the initiatives included in the EU regional policy are added. Between "ordinary intervention" and additional (EU) public spending, the less developed Italian regions received a huge amount of financial resources.

After an initial phase of enthusiasm, the results of the new planning policy are being called into question by some scholars. For example, Rossi (2005), examining some case studies, pointed out how the results obtained by the policy interventions were far below the objectives and the resources employed. Analogous considerations can be found in the work of Atella (2005) in which the new planning appears as a "staggering wasteful policy". In a less sophisticated version, the argument according to which the Southern regions received and substantially wasted a huge amount of financial resources finds a wide consensus in Italian public opinion and among politicians[4]. Very frequently, however, these arguments are not supported by data or any empirical evidence.

The role of public policy in the process of economic convergence has been extensively examined with regard to the EU' regions, but the results of empirical studies are sometimes controversial. On the one hand, some authors find that the European structural and cohesion funds have had a positive impact on economic growth (Cappelen et all. 2003; Beugelsdijk, Eijffinger, 2005; Checherita, 2009); on the other hand, Boldrin and Canova (2001) reached the conclusion that EU regional policies principally serve for redistribution purposes, motivated by political reasons, but they have little to do with fostering economic growth; the results obtained by Dall'Erba et al. (2007), show that the impact of European funds has been very weak and negative.

In Italy's case the lack of convergence has, in the past, often been interpreted as a substantial failure of national development policies (Del Monte e Giannola, 1997). With regard to the "new development policy", studies have evaluated the results

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[4] The different arguments of the debate on the policy for the development of the Mezzogiorno are examined by Viesti (2009) who, furthermore, analyses the data on public expenditure and the results obtained by the new development policy.

obtained from some instruments of the policy, such as the Territorial pacts (Accetturo e De Blasio, 2007), the Programming contracts for industrial development (Giunta e Florio, 2002; Bianchi, 2007) or from the incentives to investments (Bronzini e De Blasio, 2006). The results emerging from these studies are not univocal. If, in the case of Territorial pacts for local development, the overall results appear very modest, for other kinds of intervention, such as the Programming contracts, the evaluations show a different situation, in which there have been some successful results. On the basis of these studies it appears very hard to take conclusive stock of the new planning policy. Even though the convergence analysis does not offer direct proof as to the effectiveness of policies, useful empirical evidence and suggestions can be derived from it (Vamvakidis, 2003).

Before analysing the role of public spending, we examined its territorial distribution. Data show that the Northern Italian regions received 49% of total expenditure, while the South 28% and the Central regions 23% (Fig. 6). The disaggregation of expenditure in macro-categories, confirms that the Centre-North area received the largest part of spending flows. In particular, this concerns both the current expenditure, and that for development purposes. Significant differences can be observed even when the expenditure is considered in per capita terms. An inhabitant of the Mezzogiorno area received, on average, 8.805 euro of current expenditure and 1.106 euro of development expenditure, while an inhabitant of the Centre-North area, respectively, 12.900 and 1.189 euro. The distribution of public spending has, clearly, privileged the more developed part of Italy.

Fig. 6. Distribution of public expenditure 1996-2006 (%)
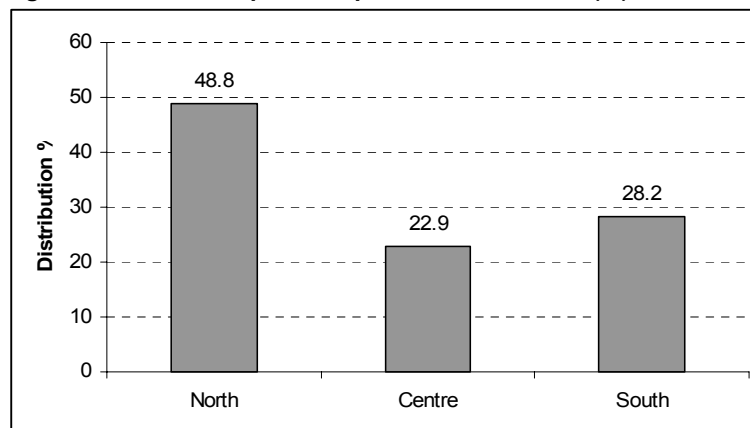
Source: Calculations on RPA Database.

Tab. 4. Territorial distribution of public expenditure, 1996-2006 (%)

Categories of expenditure	Centre-North	South
Capital	65	35
Current	72	28
Investment	67	33
Development	65	35

Source: Calculations on RPA Database.

Tab. 5. Public expenditure, average 1996-2006

Expenditure	As % of GDP		Euro per capita	
	Mezzogiorno	Centre-North	Mezzogiorno	Centre-North
For development*	7.7	4.7	1.106	1.189
For development**	6.5	3.4	847	935
Capital*	7.5	4.5	1.082	1.155
Capital**	6.4	3.2	911	813
Current*	61	51	8.805	12.902
Current**	50	41	7.186	10.302

*Enlarged public sector; **General government. Source: Calculations on RPA Database.

Fig. 7 illustrates the relationship between public expenditure for development and the per capita GDP in the twenty Italian regions. It is easy to see that there is no correlation between the two variables: in the considered decade three Northern Italian regions with "Special statute", (Valle d'Aosta, Trentino Alto Adige and Friuli Venezia Giulia) received the highest share of spending flows; other regions, as Sicily, Campania, Apulia and Calabria (the less developed) the lowest share. The regional distribution of public expenditure offers some important elements for consideration of the implementation of the regional policy. In a Nation in which profound regional development disparities exist, the distribution of financial resources aimed to territorial re-balancing should privilege the areas lagging behind. It does not seem to be the case of Italy, despite the fact that the programming documents of Development plans established that 45% of the public spending total should have gone to the Mezzogiorno area.

**Fig. 7. Public spending for development and per capita GDP
– average 1996-2006**
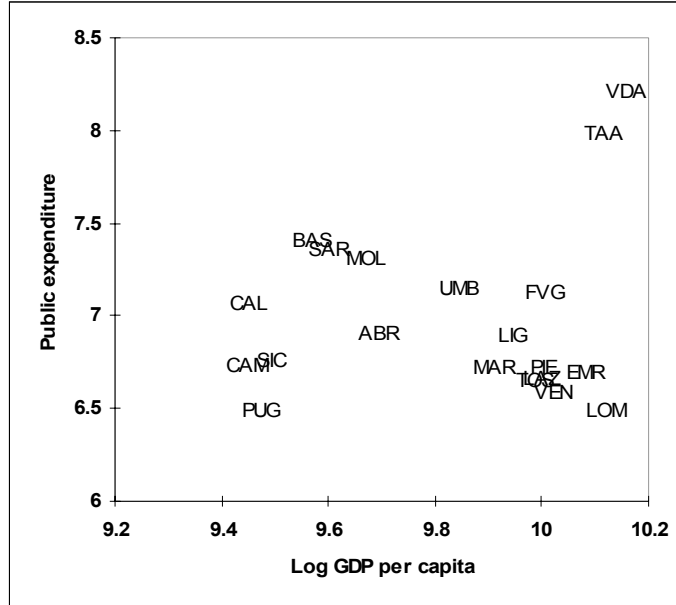
Given the distribution of public expenditure, what was the evolution of regional disparities? Tab. 6 reports the results of estimations, in which the dependent variable is the rate of growth of labour productivity and different categories of expenditure are considered. The first column shows the existence of absolute convergence; the correlation between rate of growth and initial level of development is strong and negative even in the other specifications, revealing conditional convergence. Both the capital expenditure categories seem not to have influenced regional growth, while the current expenditure exhibits a positive and significant correlation. Regions with a large agricultural employment share have grown faster: this result is consistent with the hypothesis of conditional convergence, given that in the less developed regions the share of the agricultural sector is larger.

Tab. 6. Public spending and productivity growth 1996-2006: all regions

	(1)	(2)	(3)	(4)	(5)
const	3.350**	2.861**	3.569**	3.486**	3.565**
	(7.321)	(7.894)	(10.80)	(9.654)	(10.99)
Log Productivity	-0.3151**	-0.2790**	-0.3473**	-0.3405**	-0.3471**
	(-7.314)	(-8.622)	(-11.26)	(-10.19)	(-11.42)
Development exp.		0.1272	0.1440	0.0797	
		(1.159)	(0.918)	(0.649)	
Current exp.		0.1362**	0.08895**	0.1071**	0.0883**
		(3.926)	(2.403)	(3.059)	(2.390)
Capital exp.					0.1604
					(1.058)
Agriculture		0.0535**	0.0875**	0.08126**	0.08743**
		(2.558)	(2.831)	(2.568)	(2.866)
Industry		0.0116	-0.0881	-0.0603	-0.0880
		(0.161)	(-1.11)	(-0.760)	(-1.135)
Investment			-0.1796*		-0.1836*
			(-1.686)		(-1.783)
School			0.0687**	0.0446**	0.0695**
			(4.662)	(2.302)	(4.753)
F	3.23	4.16	4.70	4.45	4.74
	[0.01]	[0.00]	[0.00]	[0.00]	[0.00]
Hausman	53.44	78.66	90.10	84.58	90.96
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
n	100	100	100	100	100
Adj. R^2	0.2978	0.3806	0.4169	0.4033	0.4196
lnL	329.6	338.5	342.8	341.0	343.1

Fixed effect. T-statistics in parentheses; for F and Hausman tests p-value are reported in squared parentheses; * indicates significance at the 10 percent level; ** indicates significance at the 5 percent level.

Different results are obtained when the model is estimated for the Centre-North and Southern regions separately. In the first case, in fact, it is possible to find a positive and significant correlation between capital and development expenditure and growth, while in the Southern regions there is no significant relationship. It is possible to note other differences in the impact of schooling, that is significant only in the Centre-North group of regions, and in the agricultural share effect that results as related to

growth only for the Southern sample. Even in these regressions, the standard test shows how the fixed effect model is consistent.

Tab. 7. Public spending and productivity growth 1996-2006: Centre-North regions

	(1)	(2)	(3)	(4)	(5)	(6)
const	2.609**	2.677**	2.768**	2.875**	2.44**	2.880**
	(6.639)	(6.776)	(6.122)	(7.042)	(6.95)	(7.202)
Log Productivity	-0.2438**	-0.2448**	-0.2545**	-0.2709**	-0.222**	-0.2714**
	(-6.629)	(-7.997)	(-5.722)	(-6.821)	(-7.45)	(-6.981)
Development exp.		0.3543**	0.3371*	0.3427*	0.411**	
		(2.491)	(1.826)	(1.811)	(2.35)	
Current exp.		0.0582	0.0612	0.0561	0.046	0.05703
		(1,246)	(1,244)	(1,120)	(0,85)	(1,139)
Capital exp.						0.3461*
						(1.755)
		(1.246)	(1.244)	(1.120)	(0.85)	(1.139)
Agricolture		-0.0991	-0.0870	-0.1181	-0.15	-0.1140
		(-0.818)	(-0.709)	(-0.850)	(-1.11)	(-0.818)
Industry		-0.1286	-0.1331	-0.0887	-0.09	-0.0937
		(-0.8969)	(-0.959)	(-0.783)	(-0.76)	(-0.822)
School			0.00670	0.0483**		0.0492**
			(0.215)	(3.070)		(3.210)
Investment				-0.2803*	-0.141	-0.2697*
				(-1.762)	(-0.842)	(-1.745)
F	4.06	3.42	3.15	3.42	3.52	3.39
	[0.00]	[0.00]	[0.01]	[0.00]	[0.00]	[0.00]
Hausman	42.65	37.52	33.26	36.88	40.78	36.53
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
n	60	60	60	60	60	60
R^2 corretto	0.17	0.29	0.28	0.30	0.29	0.30
lnL	204.2	211.7	211.7	213.5	212.5	213.4

Fixed effects. T-statistics in parentheses; for F and Hausman tests p-value are reported in squared parentheses; * indicates significance at the 10 percent level; ** indicates significance at the 5 percent level.

Tab. 8. Public spending and productivity growth 1996-2006: Southern regions

	(1)	(2)	(3)	(4)	(5)	(6)
const	4.108**	3.809**	4.062**	4.096**	3.83**	4.083**
	(6.990)	(5.448)	(7.577)	(10.25)	(5.22)	(11.35)
Log Productivity	-0.3902**	-0.3565**	-0.3836**	-0.3868**	-0.359**	-0.3875**
	(-6.987)	(-6.922)	(-10.25)	(-13.91)	(-6.36)	(-15.15)
Development exp.		-0.2861	-0.2719	-0.2547	-0.299	
		(-1.597)	(-1.358)	(-0.8992)	(-1.51)	
Current exp.		0.1456**	0.1168**	0.1115*	0.144**	0.1096
		(5,220)	(2,754)	(1,808)	(5,26)	(1,675)
Capital exp.						-0.1988
						(-0.760)
Agricolture		0.0394**	0.0562**	0.0588**	0.040**	0.0626**
		(2.291)	(2.463)	(2.215)	(2.12)	(2.344)
Industry		-0.1674	-0.1880	-0.1984	-0.162	-0.1860
		(-0.782)	(-0.910)	(-1.160)	(-0.788)	(-1.155)
School			0.0260	0.0321		0.0363
			(1.117)	(0.6475)		(0.720)
Investment				-0.0275	0.025	-0.0457
				(-0.1855)	(0.362)	(-0.325)
F	3.02	3.70	3.58	3.30	3.37	3.24
	[0.01]	[0.00]	[0.00]	[0.01]	[0.01]	[0.01]
Hausman	20.51	33.14	46.34	-	25.25	-
	[0.00]	[0.00]	[0.00]	-	[0.00]	-
n	40	40	40	40	40	40
R^2 corretto	0.42	0.52	0.51	0.49	0.50	0.48
lnL	128.1	134.8	135.0	135.0	135.0	134.6

Fixed effects. T-statistics in parentheses; for F and Hausman tests p-value are reported in squared parentheses; * indicates significance at the 10 percent level; ** indicates significance at the 5 percent level.

Several factors explain the different effects of public expenditure between the North and the South. Firstly, *coeteris paribus*, the impact of financial resources on productivity growth depends not only on their quantity, but also on the efficiency of their allocation. This regards different kinds of resources, both those aimed at physical capital accumulation and those devoted to human capital formation (Murphy et al. 1991). In the case of Italy, some studies proved that the intervention policies for the development of the Mezzogiorno area had indirect effects – such

as the reinforcement of rent-seeking behaviour - that notably limited the effectiveness of policies (Del Monte e Giannola, 1997). Differences between North and South were also found for human capital allocation among sectors, with a large prevalence of less productive activities (such as those in the public sector) in the Mezzogiorno (Di Liberto, 2001). Furthermore, it must be remembered that in the South the unemployment rate is significantly higher than in the rest of the Country, even for people with higher qualifications. Secondly, great waste and inefficiency in the use of financial resources and in public investments are documented (Rossi, 2005). Finally, as shown by a study of Marrocu and Paci (2005) different impacts of the productive inputs exist between the North and the South. Using data contained in the RPA database, these authors estimated a production function for Italy for the period 1996-2003, showing that the stock of public capital exhibits different degrees of elasticity for the two macro-areas of the Country. More specifically, the economic infrastructures, which account for the largest proportion of the public stock, were much more productive in the South compared to the rest of the Country. In contrast, all the other types of public intervention showed a negative impact in the South and a low impact in the Centre-North. In addition, the cited analysis leads to the conclusion that in the Mezzogiorno the regional and local administrations are much less efficient in delivering public funds than in the rest of Italy.

4. Conclusive remarks

This paper has examined the evolution of regional disparities in Italy and the relationship between public spending and productivity growth. The results obtained can be summarised as follows.

1. During the period 1980-2007 the process of σ-convergence has been very weak. Analytically, the substantial non-convergence in per capita GDP is explained by the fact that the convergence in labour productivity has been counterbalanced by an increase in employment rate disparities. The absolute and conditional convergence analysis — conducted using a panel data technique — shows the existence of a significant process of convergence in productivity, but a weak one in per capita GDP.

2. Data of Regional Public Accounts shows how the distribution of public spending in Italy has been characterised by significant regional differences. In

per capita terms, the more developed regions received, on average, higher public expenditure than less developed ones. This regards both current expenditure and that devoted to regional development. Differences in advantages for the Mezzogiorno can be found if the expenditure is considered as a share of regional GDP. As a whole, the regional distribution of expenditure did not correspond to the objectives programmed in the planning documents.

3. The regression analysis shows how the impact of public spending and growth differs, dependent upon the regions and the categories of expenditure. When the entire sample — composed of twenty regions — is considered, a positive relationship between current expenditure and productivity growth is found. If we split the sample into Northern and Southern regions, the estimates lead to different results. In the first group, composed of the most developed Italian regions, we found a positive and significant correlation between capital public expenditure and growth, while in the less developed Southern regions growth results are influenced by current expenditure. Despite the analysis if referred to a relative short period of time, coherent with the findings of previous studies, it tends to suggest the existence of differences not only in the amount of financial resources devoted to the North and the South of Italy, but even in the efficiency of their allocation.

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Appendix

List of regions

Centre-North	South or Mezzogiorno
Aosta Valley	Abruzzo
Piedmont	Molise
Lombardy	Campania
Trentino Alto Adige	Apulia
Veneto	Basilicata
Friuli Venezia Giulia	Calabria
Liguria	Sicily
Emilia Romagna	Sardinia
Tuscany	
Umbria	
Marche	
Lazio	