Lavoro e disoccupazione: questioni di misura e di analisi

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Industrial districts, social environment and local growth Evidence from Italy

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1. **Introduction**

Most of the empirical work on growth has focused on cross-country comparisons, whereas much less attention has been paid to the growth of different regions or smaller areas belonging to the same country. While the two contexts are similar in many respects, there are three important differences. First, local economies are more open than national economies, since factors of production can move more freely within national boundaries. Second, local economies share the same institutional and macroeconomic environment, so that many of the factors that have been invoked to explain cross-country differences cannot explain local differences. Third, only cross-regional studies can take into account the dynamic effects of Marshallian externalities, which are typically specific to small geographical areas and localized industries. These features are sufficient to characterize local growth as a separate topic, deserving specific investigation. This topic is also interesting for policy considerations. Despite uniformity of institutions and policy, in many countries local areas experience large and persistent inequalities in income levels and employment rates. For the governments, reducing local disparities by stimulating the economy in backward regions is a major policy target. Improving our understanding of the determinants of local growth can facilitate the job.

Local growth is the subject of this paper. We examine the impact of several structural and social features of the Italian provinces in 1971 on their economic performance in the period 1971-1991. We find evidence of a significant effect for a number of variables. Although some of these determinants may be peculiar to the Italian experience, reflecting the specific institutional and economic features of this country, we believe that our results can provide useful indications for other industrialized countries characterized by important local inequalities.

Our theoretical framework is that of the so-called «Barro-regression literature». The growth of per-capita income is considered as a function of both the initial level and the steady-state level of per-capita income (Barro 1991, Barro and Sala-i-Martin 1995, Barro 1997). The latter in turn is modeled as a function of a number of explanatory variables. For a given steady-state level, the lower the initial level, the higher the expected growth rate. For a given initial level, the variables having a positive effect on the steady-state level are predicted to have a positive effect on growth.

Our work departs from the existing literature in two main aspects.

First, we study growth not only in terms of output, as usual, but also in terms of employment. Although to some extent correlated, employment and output growth may differ, even in the long run, as is shown by the recent European experience. In some cases, as we shall see, the same explanatory variable may affect differently (even with different signs) employment and output. The interest of a specific analysis of employment growth is increased by the fact that for many countries –particularly in Europe– employment is currently the most important target policy variable.

Second, in addition to explanatory variables widely used in both cross-country and cross-regional studies, such as demographic and education indices, we consider a number of factors that have been so far little investigated in the empirical literature.

The first set of factors is related to the industrial structure of local areas. Marshallian external economies are often indicated as the main source of small scale agglomeration and geographical clustering of firms and industries (see Krugman 1991, Fujita and Thisse 1996). While a large number of studies provide evidence of agglomeration economies (a recent example is Ellison and Glaeser 1997), little work has been done to estimate the impact of such economies on local growth. Glaeser et al (1992) and Henderson et al. (1995) use a number of structural variables in order to analyze the role of different kinds of externalities for the growth of local industries in the US. However, the effect of such variables on the overall economic performance of local areas could be different in principle. In this paper we show that

the growth of income and employment in Italian provinces is very positively affected by the diffusion of specialized industrial districts made up of small and medium-sized firms.

The second set of variables is related to the social and political environment of local areas. Glaeser, Scheinkman and Shleifer (1995) is, to our knowledge, the first work analyzing a number of social variables in a cross-regional analysis[1]. The authors study the growth of US cities during the period 1960-1990. However, their result is partly disappointing, since most of the variables considered are not significantly correlated with growth. Here we use different variables and find different results. First, we provide evidence that social unrest and some forms of criminal behavior negatively affect employment. Second, we find that electoral behavior may affect growth, through a kind of political patronage mechanism. Finally, we estimate the effect on growth of the so-called *social capital* (Coleman 1990, Putnam et al. 1993, Trigilia 1986). While several authors have emphasized the importance of social capital, little empirical evidence has been collected. Helliwell and Putnam (1995) is an exception, focusing on the Italian regions during the period 1950-1990. Here we provide a stronger confirmation of the social capital hypothesis, based on a finer geographical disaggregation.

The paper is organized as follows. Section 2 describes the economic performance of the Italian provinces during the period. Section 3 analyses the role of demographic factors. In Section 4 we discuss human capital. Crime and social unrest are studied in Section 5. Section 6 is focused on structural variables and industrial districts. Section 7 is devoted to social capital. Section 8 concludes.

2. **The economic performance of the Italian provinces**

2.1 Indicators of growth

In this paper we analyze the growth of four variables: manufacturing employment, employment in industry and services, excluding the public sector (employment from now on), value added and per-capita value added[2]. The reason why we use four variables instead of only one, as happens for many Barro-regression type studies, is twofold. First, some of them capture different aspects of growth, each having economic interest. Second, data may be affected by measurement errors, and some variables are more reliable than others. We shall briefly discuss these two questions in turn.

Per-capita value added is close to per-capita GDP, which is the most widely used indicator of growth in cross-country studies. Its main interest is that it can be interpreted as a measure of the quality of life. However, using only per-capita figures could give a misleading picture, particularly when studying small open economies belonging to the same country. If workers were moving without friction in order to match job opportunities, per-capita income would be always the same in all areas, irrespective of how good was the performance of an area at creating such opportunities. Actually, in Italy labor mobility was far from perfect in this period, as we shall see below; despite this, migrations could have had a not negligible effect.

[1] In the case of Italy, some more recent evidence of the importance of the social environment can be found in Forni and Paba (1996), Fabiani and Pellegrini (1997), and Ferri and Mattesini (1997).

[2] See the Appendix for data sources.

By using non-normalized variables such as employment and value added we can get valuable additional information. Value added takes into account productivity. Employment growth is an important policy target, particularly for a country such as Italy experiencing high and persistent unemployment rates in some regions.

Since our indicators capture different aspect of growth, some explanatory variables may affect them in different ways. As we shall see, this is in fact the case. Different effects may have simple economic interpretation and may improve our understanding of growth.

TABLE 1 - CORRELATION COEFFICIENTS BETWEEN GROSS GROWTH RATES

	Manufacturing employment growth	*Employment growth*	*Value added growth*	*Per capita value added growth*
Manufacturing employment growth	1.00			
Employment growth	0.89	1.00		
Value added growth	0.66	0.68	1.00	
Per capita value added growth	0.56	0.49	0.91	1.00

Despite differences, the indicators of growth based on our four variables are closely correlated, as shown in Table 1. Hence, at least as a rough approximation, we can regard these indicators as competing measures for the same general phenomenon. If we take this second point of view, reliability becomes a crucial issue. Value added data have two main shortcomings: first they are nominal and, second, they are based on estimates, not on census surveys. On the other hand, employment data on some services, particularly commerce, could be substantially overestimated, since a worker could be registered as employed in the family firm when being actually only part-time employed or even unemployed. Data on manufacturing employment are probably the most reliable. This is the reason why we included manufacturing employment among the dependent variables.

The possibility of measurement errors should be taken into account when reading regression results. If we do not have *a priori* reasons to expect different effects for the same explanatory variable, consistent results should be interpreted as supporting each other, while opposite signs of the coefficients should suggest caution.

2.2 The performance of the Italian provinces

Table 2 gives a general picture of growth for three large Italian regions with different economic structures: the Northwest, the Center-Northeast and the South (including Sicily and Sardinia). The Northwest, which roughly coincides with the so called `Industrial Triangle' formed by Genoa, Milan and Turin, was at the beginning of the period a rich area, characterized by large firms such as Fiat and old industrial traditions. The Center-Northeast is a very large and heterogeneous region including Rome in the south as well as Venice and the Eastern Alps in the north. A common feature of this area is that here industrialization was more recent than in the Northwest and mainly based on small firms and the so-called `industrial districts' (see Section 6). Lastly, the South was a very poor area characterized by large unemployment and low industrialization.

TABLE 2 - GROSS GROWTH RATES

	Northwest	*Center and Northeast*	*South*	*Italy*
Manufacturing employ. growth	0.84	1.19	1.25	1.02
Employment growth	1.05	1.31	1.41	1.22
Value added growth	20.71	23.81	22.49	22.37
Per-capita value added growth	20.75	22.91	20.81	21.47

As shown in Table 2, in the whole country employment in industry and services in 1991 was 22% higher than in 1971. The growth was basically due to the service sector, while the level of manufacturing employment experienced a modest growth of 2%. Manufacturing employment reduced dramatically in the Northwest (-16%), while it grew considerably in the Center-Northeast (+19%) and in the South (+25%).

The poor performance of manufacturing employment in the rich Northwestern regions was only partly explained by the increasing share of service activities, a phenomenon common to all industrialized countries. The service sector grew almost everywhere in Italy, but to a lesser extent in the Northwest (only 32% as against over 40% in the other regions). As a result, in the Northwest the net employment growth rate was only 5%, as against 31% and 41% respectively in the Center-Northeast and in the South.

For value added data we take 1990 as the final date since data on 1991 are not available. In 1990, nominal value added was about 22 times larger than in 1971, owing mainly to the large and persistent inflation occurring in Italy during this period. When looking at value added data, both in levels and per-capita terms, the Center-Northeast performed better than the South. Moreover, differences between the three large regions considered are substantially smaller. This indicates that productivity grew faster in the Northwest than in the other regions (particularly the South), perhaps because of the large labor-saving restructuring occurring in many large firms during the eighties.

A more disaggregated analysis reveals that performance was heterogeneous within regions, particularly in the South (see Tables 3 and 4). With few exceptions, the provinces along the Adriatic coast and in Center-Southern Apennines exhibit high growth rates both for employment and value added (see the ranks of Avellino, Teramo, Campobasso, Isernia, Chieti, L'Aquila, Pescara). On the other hand, low rates prevail for many Sicilian cities (Agrigento, Enna, Trapani, Siracusa). The bad performance of Sicily —and, to a lesser extent, Calabria— suggests that criminal organizations such as Mafia, 'Ndrangheta and Camorra could have played an important role in slowing down the growth of some Southern provinces. The effects of crime on growth will be analyzed in detail in Section 5.

In the Center-Northeast the worst performance is that of the Tyrrhenian coast of Tuscany (Massa-Carrara, Grosseto, Siena) and Eastern Friuli (Gorizia and Trieste). Many provinces in Veneto (Belluno, Padova, Vicenza, Verona, Treviso, Rovigo), Emilia (Forli) and Marche (Pesaro, Macerata) appear among the twenty fastest-growing provinces either for employment or for value added. This distribution of growth is roughly similar to the geographic distribution of industrial districts at the beginning of the period. The role of this kind of industrial structure is analyzed in detail in Section 6.

In the Northwest, Lombardia performed better, whereas several provinces belonging to Piedmont and Liguria appear in the twenty slowest-growing ranks according to all indicators (Genoa, Turin, Savona, Imperia).

TABLE 3 - THE 20 FASTEST-GROWING PROVINCES

	Manufacturing employment		Employment in industry and services		Value added (nominal)		Per-capita value added (nominal)	
Rank	Province	Gross growth rate	Province	Gross growth rate	Province	Gross growth rate	Province	Gross growth rate
1	Teramo	2.38	Avellino	1.99	Latina	30.9	Rieti	29.7
2	Campobasso	2.17	Teramo	1.93	Avellino	30.5	Avellino	29.6
3	Avellino	1.97	Isernia	1.83	Rieti	30.1	Macerata	27.9
4	Isernia	1.96	Ragusa	1.82	Teramo	29.0	Nuoro	27.8
5	Lecce	1.95	Frosinone	1.77	Frosinone	28.8	L'Aquila	27.7
6	Chieti	1.93	Chieti	1.77	Macerata	28.7	Rovigo	27.2
7	Nuoro	1.87	Lecce	1.75	Nuoro	28.6	Isernia	26.8
8	Frosinone	1.78	Campobasso	1.69	Vicenza	28.6	Teramo	26.6
9	Ascoli P.	1.76	Potenza	1.65	Bergamo	28.5	Forli	26.3
10	L'Aquila	1.73	Benevento	1.62	L'Aquila	28.2	Vicenza	25.9
11	Pescara	1.59	Ascoli P.	1.60	Forli	28.2	Campobasso	25.7
12	Potenza	1.57	Nuoro	1.58	Padova	27.3	Asti	25.6
13	Pesaro	1.56	Treviso	1.57	Verona	27.1	Padova	25.4
14	Macerata	1.52	L'Aquila	1.57	Bari	27.1	Frosinone	25.4
15	Belluno	1.51	Latina	1.53	Campobasso	27.0	Bergamo	25.3
16	Treviso	1.46	Pesaro	1.53	Rovigo	26.8	Verona	25.3
17	Padova	1.45	Sassari	1.52	Isernia	26.8	Belluno	25.0
18	Benevento	1.43	Bari	1.51	Pesaro	26.5	Sondrio	25.0
19	Tarantо	1.41	Bolzano	1.50	Lecce	26.4	Cremona	24.9
20	Vicenza	1.41	Perugia	1.49	Treviso	26.3	Pesaro	24.9

TABLE 4 - THE 20 SLOWEST-GROWING PROVINCES

	Manufacturing employment		Employment in industry and services		Value added (nominal)		Per-capita value added (nominal)	
Rank	Province	Gross growth rate	Province	Gross growth rate	Province	Gross growth rate	Province	Gross growth rate
1	Genova	0.61	Genova	0.82	Enna	14.1	Enna	15.3
2	Trieste	0.65	Trieste	0.83	Genova	15.9	Taranto	15.8
3	Pavia	0.67	Pavia	0.88	Torino	16.9	Cagliari	16.3
4	Torino	0.71	Torino	0.92	Imperia	17.1	Matera	16.6
5	Livorno	0.71	Vercelli	0.95	Trieste	17.7	Torino	17.3
6	Savona	0.71	Savona	0.97	La Spezia	17.7	Siracusa	17.8
7	Milano	0.72	Alessandria	0.98	Matera	17.8	Imperia	17.9
8	Aosta	0.74	Milano	0.99	Savona	17.9	Massa	18.2
9	Gorizia	0.80	Novara	1.00	Massa	18.1	Genova	18.2
10	Vercelli	0.80	Livorno	1.04	Taranto	18.2	Grosseto	18.3
11	Novara	0.80	Gorizia	1.04	Grosseto	18.3	Terni	18.4
12	Imperia	0.81	Terni	1.06	Terni	18.4	Savona	18.6
13	Terni	0.83	Massa	1.07	Cagliari	18.9	Trapanio	18.7
14	Agrigento	0.85	Imperia	10.8	Messina	19.2	Ragusa	18.8
15	Alessandria	0.86	Varese	1.08	Gorizia	19.6	Napoli	18.9
16	Massa	0.86	Asti	1.09	Siracusa	19.6	Palermo	19.0
17	Varese	0.90	Piacenza	1.13	Reggio C.	19.6	Foggia	19.0
18	Enna	0.92	Foggia	1.14	Ravenna	19.6	La Spezia	19.1
19	Asti	0.93	Grosseto	1.14	Trapani	19.7	Messina	19.4
20	Siena	0.94	Caltanissetta	1.15	Siena	20.1	Aosta	19.4

Poor provinces performed better than rich provinces on average, both unconditionally and conditionally to several explanatory variables, as we shall show in the following sections. However, the dispersion of per-capita value added in 1990, as measured by the ratio of the standard deviation to the mean, is almost equal to that of 1971 (0.254 as against 0.259). In the terminology of the literature on convergence, there was beta-convergence but not sigma-convergence during this period.[3] In 1991, the ten richest provinces had on average 2.28 times the average per capita value added of the ten poorest provinces as against a ratio of 2.47 in 1971. Since in poorer provinces prices are lower, this impressive figure would be smaller with real output data. Moreover, differences would be reduced further when considering disposable income in place of value added, owing to the redistribution effects of the fiscal system. But these caveats cannot change the conclusion that local inequalities are still very large in the nineties.

This should not be interpreted as meaning that there was little change. The rate of growth of per-capita value added of the fastest-growing provinces was almost twice that of the slowest-growing. As a consequence, the relative position of some cities changed substantially. In 1971 the per capita income of Turin was about twice that of Rovigo (Northeast); in 1990 the two incomes were about the same. Two Southern cities, Avellino and Enna, had a similar story. In 1971 the per capita income of Avellino was only 66% of that of Enna; in 1990 Avellino is about 25% richer than Enna.

Avellino is placed in the first three ranks in all the lists above. If we abandon provinces and look at a finer geographic disaggregation based on 955 smaller areas,[4] we find that the best performance in terms of employment[5] is obtained by the area of Nusco, a small town belonging to the province of Avellino. Such an outstanding performance of the province of Avellino, and Nusco in particular, might have something to do with the fact that the latter is the birthplace and the core of the constituency of Ciriaco De Mita, who was one of the most powerful members of the Christian Democrat Party during the period. A similar suspicion arises when looking at the excellent performance of the four provinces of Abruzzo, i.e. Teramo, Chieti, L'Aquila and Pescara. These provinces formed the constituency of the Christian Democrat exponent Remo Gaspari, who was minister for over twelve years in thirteen different governments between 1971 and 1991. The idea that prominent policy makers could have favored their constituencies in some way in order to reinforce their political power is analyzed in detail in Section 7.

3. **Demography**

It is quite common in Barro-type regressions to include demographic variables such as the fertility rate on the right-hand side. Fertility is typically found to have a significant negative impact on the growth rate of per-capita output (see Barro 1991, 1997). The Solow model gives a simple explanation. In this model, the steady-state level of per-capita output is negatively affected by the growth rate of population, since where population grows faster a larger fraction of capital must be devoted to new workers instead of enhancing productivity of existing workers. Moreover, an economy

[3] On the mutual consistency of these two seemingly opposite results see Quah (1993).

[4] For more details on this disaggregation see Section 6.

[5] Data on value added are not available at this disaggregation level.

grows faster the larger is the distance between its starting level and its steady-state level. Hence, out of two economies having the same starting level of per-capita output, the one having the larger population growth rate grows less.

Of course, the assumption that population growth is exogenous, while being reasonable as a first approximation for the closed economy of the Solow model, is untenable for real world open economies —particularly provinces belonging to the same nation— since people can move from slow-growing to fast-growing areas. Hence we cannot simply insert population growth on the right hand side of the regression equation. On the other hand, migrations are costly and mobility is usually imperfect. In Italy the yearly net migration rate between 1971 and 1991 varies across provinces from approximately –0.005 to +0.005, while the cross sectional average of the absolute rates is 0.0022. This means that in twenty years net migrations are only about 4 per cent of total population on average. Hence we can expect both relative economic performances and exogenous demographic factors to affect that population. By including these factors on the right-hand side of the equation we should be able to capture the effects of exogenous population changes.

Here we use the fraction of population aged 20 years or less in 1971. This variable is preferable to the average fertility rate during the period, since important feedback effects could affect the latter. In particular, fertility could be reduced by an increase in the female activity rate, which in turn could be raised by a good economic performance of an area.

TABLE 5 - GROWTH AND DEMOGRAPHY

	Log Manufacturing employment growth (1971-1991)	Log Total employment growth (1971-1991)	Log Value added growth (1971-1990)	Log Per capita value added growth (1971-1990)
Intercept	0.079	0.076	2.957	3.318
Log (Share of manufacturing Employment 1971)	0.145 (0.090)			
Log (Employment rate 1971)		0.080 (0.086)		
Log (Per capita value added 1971)	-0.735** (0.156)	-0.522** (0.116)	-0.571** (0.086)	-0.621** (0.071)
Percentage of population aged 20 years or less in 1971	0.299 (0.708)	0.877** (0.401)	0.834** (0.387)	-0.380 (0.319)
Geographical dummies				
Center and Northeast	0.141** (0.066)	0.081** (0.038)	-0.007 (0.036)	-0.040 (0.030)
South	0.041 (0.122)	-0.024 (0.074)	-0.345** (0.063)	-0.333** (0.052)
Number of observations	94	94	94	94
Adjusted R2	0.380	0.498	0.411	0.481

Numbers in parentheses are standard errors
* : 10% significance level; ** : 5% significance level.

Actually, the percentage of young people in 1971 has a strong positive correlation with subsequent population growth (the correlation coefficient is 0.65), so that we expect this variable to have a negative impact on per-capita value added growth. What about the expected effect on output and employment? The Solow model predicts that output

growth is positively affected by population growth, as suggested by intuition.[6] Regarding employment, the prediction of the Solow model is trivial, since employment and population are proportional. Clearly this assumption is a rather drastic simplification, particularly for European countries, where empirical evidence suggests that unemployment is not mean reversing; however, it is reasonable to expect that a larger growth of population and labor supply causes a larger, though not necessarily proportional, growth of employment in the long-run. Hence we expect that the percentage of population aged 20 years or less in 1971 had a positive impact on both employment and value added growth.

Table 5 shows the results obtained by regressing equation by equation our four dependent variables, expressed in logs, on the constant, the per-capita value added in 1971, the percentage of population aged 20 years or less in 1971, and two regional dummies. In the manufacturing employment equation we have inserted on the right-hand side an additional initial condition, i.e. the log of manufacturing employment share in 1971. Similarly, in the employment equation we have inserted the log of employment rate (employment in industry and services excluding public administration divided by population aged 14 years or more). Here we confine ourselves to noting that both variables are not significant.

As usual for Barro-type regression the coefficient of the log of per capita value added in 1971 is negative and highly significant in all of the equations. The coefficient –0.6 entails a rate of conditional convergence of about five per cent per year, which is substantially higher than the 2% found by Barro and Sala-i-Martin (1995). The coefficient and the implied convergence rate are even higher in the general regression of Section 8 (see Table 11).

The coefficient of the percentage of population aged 20 years or less in 1971 has the expected sign in all of the equations. The positive effect on both total employment and value added growth is significant at the 5% level. A one per cent increase in the fraction of young people at the beginning of the period raises both employment and value added by something less than one per cent on average in the subsequent twenty years. These results remain almost unchanged when additional explanatory variables are included in the regression (see Table 11).

The negative impact on per-capita value added growth is smaller in absolute value and not significant. The negative sign is confirmed in the general regression of Section 8, but in the latter regression the *t*-value is larger and the coefficient is significant at 10% level.

Regarding manufacturing employment growth, the coefficient is smaller than in the total employment equation and not significant, suggesting that manufacturing employment is relatively insensitive to labor supply changes, even in the long run. This conclusion however is not confirmed by the general regression of Table 11, where the coefficient is substantially higher and similar to what is found for total employment and value added (though still being not significant). Hence we remain agnostic on this point.

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[6] To see this, consider the production function $y_i = k_i^{\alpha}$, where y_i and k_i are output and capital per effective worker in province *i*, along with the capital accumulation equation $\dot{k}_i = sy_i - (n_i + g + d)k_i$, where *s* is the saving rate, n_i is the growth rate of population, *g* is the growth rate of technology and *d* is the depreciation rate. Now let us consider two areas, *i* and *j*, starting from the same initial values, i.e. $y_i = y_j = y$ and $k_i = k_j = k$. We have $(\dot{k}_i - \dot{k}_j)/k = -(n_i - n_j)$ and $(\dot{y}_i - \dot{y}_j)/y = -\alpha(n_i - n_j)$. Hence, denoting with Y_i the output level of province *i*, $\dot{Y}_i/Y_i - \dot{Y}_j/Y_j = (1-\alpha)(n_i - n_j)$. Since $0 < \alpha < 1$, the expression on the right-hand side is positive if and only if $n_i > n_j$.

4. Education

There is by now a large body of evidence that education positively affects growth, conditionally on the starting level of per capita output (see Barro 1991 and 1997, Barro and Sala-i-Martin 1995). Forni and Paba (1996) and Ferri and Mattesini (1997) have recently highlighted a similar result for Italian provinces. A possible explanation is that higher education implies greater productivity of labor and therefore a higher steady state level of per-capita output. This implies that, holding the initial level fixed, economies with higher education will experience a larger growth of per-capita output.

Clearly, the effect on value added growth should also be positive if employment is fixed, but the effects on employment are not obvious. A higher education may render an area more competitive, thus stimulating investment and employment. On the other hand, a higher education could produce a mismatching between demand and supply of skills in the labor market, thus causing unemployment and migration.

TABLE 6 - GROWTH AND EDUCATION

	Log Manufacturing employment growth (1971-1991)	Log Total employment growth (1971-1991)	Log Value added growth (1971-1990)	Log Per capita value added growth (1971-1990)
Intercept	0.254	0.244	3.280	3.236
Log (share of Manufacturing Employment 1971)	0.042			
	(0.091)			
Log (Employment rate 1971)		-0.064		
		(0.095)		
Log (Per capita income 1971)	-0.844**	-0.481**	-0.842**	-0.803**
	(0.175)	(0.122)	(0.084)	(0.066)
Illiteracy rate in 1971	-2.842**	-1.652**	-3.440**	-2.844**
	(1.165)	(0.761)	(0.550)	(0.433)
Technical education 1971	10.150**	4.426*	4.987**	4.779**
	(4.248)	(2.600)	(2.052)	(1.617)
Higher education 1971	-1.769	-1.395*	-0.182	0.179
	(1.290)	(0.733)	(0.586)	(0.462)
Geographical dummies				
Center and Northeast	0.159**	0.105**	0.019	-0.027
	(0.066)	(0.040)	(0.032)	(0.025)
South	0.242*	0.136*	-0.074	-0.189**
	(0.129)	(0.079)	(0.063)	(0.049)
N	94	94	94	94
Adjusted R2	0.468	0.526	0.603	0.681

Numbers in parentheses are standard errors
* : 10% significance level; ** : 5% significance level.

Here we use three variables describing education. The first one is the illiteracy rate in 1971, i.e. the percentage of population aged more than six years who could not read and write according to the census of population of 1971. The second variable measures high level education: this is the percentage of population aged more than twenty years with a secondary school diploma or university degree. The third variable is interpreted as measuring professional qualification,

i.e. the percentage of population aged more than thirteen years enrolled in a professional or technical course during 1971.[7] It is worth noticing that these professional courses do not give access to university. They are usually provided by local institutions, last for a few months, and are often attended by people who already have a job. The correlation between our education variables is very low. In particular the illiteracy rate and the index of high level education exhibit a very small positive correlation coefficient (0.05), whereas the highest coefficient in absolute value is between professional education and illiteracy (-0.28).

Table 5 shows the results obtained by regressing each of our four growth indexes on the initial conditions, the geographical dummies and the variables describing education. In contrast with previous cross-country evidence (see Barro and Sala-i-Martin 1995) primary education, as measured by the illiteracy rate, appears to be significant in all equations, with a large t-value for value added and per-capita value added. A one per cent increase in illiterate population is estimated to reduce both value added and per capita value added growth by about three per cent in the whole period, whereas a one standard error increase reduces growth by about fifteen per cent.

Both the size and the *t*-value for value added and per capita value added are confirmed when looking at the general regression reported in Table 11. Note however that in the general regression the effect of illiteracy on employment growth, though still having a positive sign, is reduced in size and is not significant. The reduction is mainly due to the inclusion of a criminality index which is correlated with illiteracy (the correlation coefficient is 0.58). Our interpretation is that illiteracy *per se*, while having a large impact on labor productivity, has a small effect on employment growth. The 5% significance of Table 5 is due to the fact that here illiteracy acts as a proxy for criminal activity.

Let us now deal with technical and professional education. This variable has the expected sign and is significant at the 5% level in all but the employment growth equation, where significance holds only at the 10% level. Also in this case, both the size and the *t*-value of the coefficients reduce when including other explanatory variables. The effect on productivity, however, seems to be particularly robust, since per capita value added is still significant at the 5% level in the regression of Table 11.

Results for higher education are somewhat puzzling. Contrary to the cross-country evidence (see Barro 1991 and Sala-i-Martin 1995) we find a very low and not significant coefficient for per-capita value added growth. Moreover, the coefficients of employment and value added growth are negative. However, much better results are obtained in the general regression of Table 11. Here the sign for value added growth is positive and the coefficient of per-capita value added growth is significant at the 5% level as expected. But we have still a negative coefficient for manufacturing employment.

Our overall conclusion is that the effects of education on employment are small in size and have ambiguous sign, while there is clear evidence that education, particularly primary education, positively affects both value added and per-capita value added.

5. Social variables: labor conflicts and crime

In the neoclassical model, growth is affected by the saving rate, which is identified with the investment-output ratio, treated as exogenous. Empirical evidence suggests that the investment ratio has in fact a positive effect on growth (see

[7] This variable is a flow rather than a stock variable. We used it since the corresponding stock variable is not available.

Levine and Renelt, 1992, Mankiw, Romer and Weil, 1992, De Long and Summers, 1991). However, investment is something that should if possible be explained, rather than taken as given. Hence the question is about the determinants of investment. Clearly the saving rate is not particularly important for open economies. In cross-country studies it has been argued that investment may be affected by political instability, democracy, the rule of law, corruption and the quality of political institutions (for a survey see Barro and Sala-i-Martin, 1995). All of these variables, however, make little sense when comparing small geographical areas belonging to the same nation. Rather, the risk and the expected returns from private investment could be affected by variables describing the social environment. In this Section we present the results obtained by including two such variables in the regression equations: a criminality index and a variable describing the climate of industrial relations. Variables related to the industrial structure and the so-called `social capital', which are discussed in the following sections, can also be interpreted in a similar way.

TABLE 7 - GROWTH, LABOR CONFLICTS AND CRIME

	Log Manufacturing employment growth (1971-1991)	Log Total employment growth (1971-1991)	Log Value added growth (1971-1990)	Log Per capita value added growth (1971-1990)
Intercept	0.262	0.281	3.259	3.254
Log (Share of manufacturing employment 1971)	0.078 (0.081)			
Log (Employment rate 1971)		-0.005 (0.079)		
Log (Per capita income 1971)	-0.763** (0.137)	-0.513** (0.106)	-0.659** (0.084)	-0.610** (0.068)
Murders per 1000 inhabitants 1970-72	-2.052** (0.393)	-1.152** (0.238)	-0.896** (0.233)	-0.695** (0.189)
Hundreds of hours lost by labor conflicts per inhabitant 1970/72	-0.563** (0.272)	-0.288* (0.163)	-0.034 (0.164)	-0.161 (0.132)
Geographical dummies				
Center and Northeast	0.103 (0.059)	0.063 (0.036)	-0.028 (0.037)	-0.053* (0.029)
South	0.159 (0.107)	0.085 (0.067)	-0.252** (0.061)	-0.305** (0.049)
N	94	94	94	94
Adjusted R2	0.545	0.592	0.464	0.546

Numbers in parentheses are standard errors
* : 10% significance level; ** : 5% significance level.

We measure criminality by the number of murders in the years 1970, 1971 and 1972 divided by population in 1971 (expressed in thousands); we shall discuss this index in detail at the end of this section. The variable describing industrial relations is the hundreds of hours lost for labor conflicts during the years 1970, 1971 and 1972, divided by population in 1971.[8] In order to interpret the results correctly, it is worth noting that labor conflicts are not an indicator of the level of unionization. The Italian cities where the three main unions CGIL, CISL and UIL are stronger are characterized by tough but responsible negotiation, and the resort to strikes is not so frequent (Trigilia 1986). In the ranking of labor conflicts, cities with old industrial traditions and strong trade unions like Milan, Turin and Genoa do

[8] For the sources of these data see the Appendix.

not appear in the first 25 places. By contrast, among the first 15 cities we see again many Southern cities with a small number of large firms and low unionization such as Bari, Palermo, Foggia, Siracusa, Catania, Caltanissetta, Agrigento, Sassari.

Our guess is that both social conflicts and criminal activity, although for rather different reasons, prevent growth by reducing the expected value and raising the risk of returns from private investment. This prediction is largely confirmed by the results reported in Table 7. In all of the regression equations, both variables have a negative coefficient. Murders are significant in all equations at the 5% level, with a *t*-statistic particularly high for the employment variables. Labor conflicts are significant at the 5% level for manufacturing employment, at the 10% level for total employment.

The picture is somewhat different when looking at the general regression of Table 11. The correct sign is preserved in all of the equations, but murders lose significance in the value added regressions. This is due to the joint introduction on the right-hand side of two explanatory variables which are strongly correlated with murders, namely the illiteracy rate —we have already noted this correlation in the previous section— and the electoral participation index, which will be commented upon in Section 7. The different behavior of the employment and the value-added variables is far from obvious and remains an open question. We conclude here that labor conflicts and crime reduce employment growth, while the effects on value added growth are less clear.

The relation between crime and the long run behavior of local economies deserves some more discussion. Two observations are in order. First, not all kinds of criminal activity are related with growth. We tried several indices, such as the number of thefts, robberies and extortion, frauds, rapes and so on. It turns out that these indicators, with the partial exception of robberies and extortion, do not affect growth and are not correlated with murders. This may be partly due to the fact that many of these crimes are often not reported, so that the quality of the data is poorer than in the case of murders. But it should be recognized that «crime» indicates a variety of different phenomena, as testified for instance by the fact that murders are negatively correlated with per-capita value added (the correlation index is –0.46), whereas correlation is positive for thefts and frauds (0.36 and 0.39 respectively). In Italy most murders are related to some form of organized criminality. At the beginning of the seventies, six out of the first 15 cities with the highest number of homicides are in Sicily, three in Campania, two in Calabria, two in Sardinia, one in Puglia. These rankings have not changed substantially over time. In these regions, most of the criminal activity is carried out by affiliates to criminal organizations such as Mafia, Camorra, N'drangheta and Sacra Corona Unita. From this point of view, our results can be interpreted as indicating that organized crime, by discouraging investment and by creating a climate of social fear and mistrust, is partially responsible for unemployment.

The second observation is that there could be a reverse causality running from economic growth or the employment rate level to criminal activity (see, for example, Gleaser et al. 1996). Our data set provides some evidence on this. We have already seen that murders are negatively correlated with per-capita value added in 1971. The same holds for the employment rate in 1971 (-0.53), the employment growth rate between 1951 and 1971 (-0.34) and the manufacturing employment growth rate in the same period (-0.45). Regressing murders on the constant, the geographical dummies, the employment rate in 1971 and the employment growth rate between 1951 and 1971 gives a corrected R-square of 0.41, with the latter two variables having a t-statistic of -2.08 and -1.45 respectively. These correlations suggest the existence of a «poverty trap»: criminality is higher where employment is low and slow growing, and higher criminality, in turn, depresses private investments and employment growth.

We do not proceed further in the investigation of the causes of criminal activity, since a comprehensive treatment of this issue, though extremely interesting, is far beyond our aims. However, the above considerations and results may raise the suspicion that the figures in Table 7 reflect a spurious causality, with murders acting as a proxy for both the employment rate in 1971 and the growth rate of employment between 1951 and 1971. In order to check for this, we included the latter two variables in the regression equation of Table 7 (not shown). We found that the relationship between past employment growth and current growth is positive and significant. However, the coefficient of our crime index, while being slightly lower in absolute value than in Table 7, remains highly significant for all of the dependent variables, so that the above spurious causality is rejected.

6. Growth and industrial districts

Small scale agglomeration and geographical clustering of firms are often explained by invoking Marshallian external effects emerging from personal and informal communication within groups of individuals and firms producing similar goods in a restricted geographical area (see for example Lucas 1988, Krugman 1991, Fujita and Thisse 1996). This information exchange, which may concern products, technologies and markets, has a local public good nature, which may give clustered firms a competitive advantage over more geographically disperse production units.

Spillover effects and Marshallian external economies are at the heart of the literature on industrial districts. Pyke and Sengenberger defined industrial districts as local "productive systems, characterized by a large number of firms that are involved at various stages, and in various ways, in the production of a homogeneous product. A significant feature is that a very high proportion of these firms are small or very small" (Pyke and Sengenberger 1990, p.2). This literature has always claimed the superior economic performance of the industrial districts in many sectors. In Italy, these productive systems dominate most of the more competitive and dynamic manufacturing industries, many of which are low-tech but design intensive (Brusco and Paba 1997). A large part of the so-called Made in Italy, products in which the country is world leader in terms of exports, are produced in these geographically concentrated industries (Fortis 1996). Firms in the districts usually pay higher wages and gain higher profits than larger firms of the same sectors located outside the districts (Signorini 1994, Fabiani et al. 1997). Lastly, firms in the industrial districts seem to confront better the downturns of the business cycle (Brusco 1982). The overall good performance of the industrial districts is witnessed by the increasing share of the districts in total Italian manufacturing employment, which rose from 10% in 1951 to 32% in 1991 (Brusco and Paba 1997).

But why should industrial districts perform better than other productive systems? Several reasons can be put forward in order to justify this claim. First, industrial districts may grow because of the importance of knowledge spillovers between firms belonging to the same industry and located in the same area (Glaeser et al. 1992, Henderson et al. 1995). As the Italian case clearly shows, Marshallian externalities occur not only in high-tech sectors, where research and development is intense and the rate of technological innovations high, but also in more traditional industries where small improvements in design, product development and processes are crucial for competition. Second, geographic concentration of industries, by stimulating competition among a large number of local firms, promotes efficiencies and specialization and encourages innovation (Porter 1990). Third, industrial districts may grow because of their competitive advantage in a world where Fordist mass production, based on large vertically integrated firms and standardized products, is outmoded (Piore and Sabel 1984, Best 1990). The industrial districts usually offer a great variety of differentiated goods, produced in short production runs. Their production structure is flexible, and able to adapt quickly to frequent changes in demand, which characterize many industrial markets. Lastly, although the set of

social relations and institutional characteristics may differ across regions (see Digiovanna 1995 and Markusen 1996), industrial districts usually flourish in very special social and institutional settings, which favor the accumulation of entrepreneurial skills, the training of specialized labor force, good shared infrastructures, and pro-business local government policies.

It is not easy to identify the Marshallian industrial districts using official statistical data. The empirical identification requires the use of finely geographically disaggregated data on employment, size of firms, and sectoral composition of the industry. These data must be combined, with a complex statistical algorithm, in order to take into account the four conditions illustrated above and suggested by the theory. In this paper we adopt the same statistical procedure developed by Sforzi (1990) and Brusco and Paba (1997).

The first step is to find the appropriate geographical dimension that captures most of the external effects that are supposed to exist in the Marshallian districts. The existing literature on city growth usually refers to small territorial units based on administrative boundaries (such as counties or standard metropolitan areas in the US). In this paper, following Sforzi (1990), we look at the economy and we define the territorial unit on the basis of the characteristics of the labor market. The reason is simple. Marshallian externalities are basically generated by informal exchanges of information on technology and markets, and this flow of information, which requires close proximity between firms, entrepreneurs and workers, is maximized when firms share the same labor market. It is possible to identify empirically the geographical boundaries of the local labor markets by looking at movements of workers across space. Following this procedure and using 1981 Census of Population data on commuter flows, Sforzi (1990) identified 955 local labor markets for Italy. Here we use the same geographical partition in order to identify the industrial districts. We define a local labor market as an industrial district if it satisfies the following four conditions: (1) manufacturing activity must be prevailing, (2) small and medium sized firms must characterize the industrial structure, (3) there must be specialization in some industrial sector, and (4) al least one specialized sector must be dominated by small and medium sized firms[9]. Behind the first condition, there is the idea that the local system must be characterized by what Marshall called the "industrial atmosphere". This condition excludes big cities, where the share of service activities is predominant. Specialization signals the existence of agglomeration economies and increasing returns (internal or external to firms). Lastly, the small firm condition suggests the existence of widespread entrepreneurial skills in the local area. It also implies the exclusion of local industrial systems dominated by large firms, as in the case of the so-called company towns. Many small sized firms in geographically concentrated industries also imply a high degree of local competition, as emphasized by Porter (1990), and the supply of a greater variety of goods.

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[9] More formally, let L indicate the number of employees, and the subscripts i the industrial sector (2 digits), j the local system, m the manufacturing employment, t total employment (less agriculture and public sector), <100 firms with less than 100 employees, n the national economy. Then we have:

(1) $L_{mj} / L_{tj} > L_{mn} / L_{tn}$ (Share of manufacturing)
the share of manufacturing employment over total employment must be greater than the corresponding share at national level.

(2) $L_{mj<100} / L_{mj} > L_{mn<100} / L_{mn}$ (Small firm condition)
the share of manufacturing employment in firms with less than 100 employees must be greater than the corresponding share at national level. The choice of 100 employees as a threshold is somewhat arbitrary. How small is small depends on the size distribution of firms in each national economy. By European standards, a small firm has less than 250 employees, but in Italy more than half of workers in the manufacturing sector are employed in firms with less than 50 employees.

(3) $L_{ij} / L_{mj} > L_{in} / L_{mn}$ (Specialization)
at least one manufacturing sector in the local system must be specialized. Specialization is a measure of the importance of agglomeration economies and increasing returns (internal or external to firms).

(4) $L_{ij<100} / L_{ij} > L_{in<100} / L_{in}$ (Small firm specialization)
in at least one of the specialized sectors, the share of employment in firms with less than 100 employees must be greater than the national average.

Applying the above conditions to the whole country, however, does not allow the industrial districts located in the Southern regions to be identified. The reason is that South Italy is very poorly industrialized, and most places do not satisfy condition (1). For the Center and North of the country, the average share of manufacturing employment over total employment is 0.46, but it is only 0.30 in the South. To solve this problem, we computed the algorithm for the Southern regions using local averages.

Using this algorithm, we found that 21% of local labor markets (196 out of 955) were characterized by the presence of industrial districts in 1971, most of them concentrated in the Central and Northeastern regions of the country. In order to estimate the impact of these productive systems on the economic performance of the Italian provinces, we computed for each province the ratio of employment in industrial districts to total manufacturing employment in 1971. This is our `industrial districts' variable.

In addition to this index we use three other explanatory variables describing the production structure. The first is an index reflecting the sectoral composition of manufacturing employment. This index arises from the idea that a province specialized in the fastest growing sectors at the beginning of the period may be favored with respect to a province specialized in the slowest-growing sectors. Our sectoral composition index is a measure of such an initial advantage. This index is constructed by computing, for each province, the number of employees that would have been there in 1991 if each local two-digit sector had experienced the same growth rate as the nation-wide sector, and dividing this number by the actual manufacturing employment in 1971 (a formal definition is given in Appendix). The second variable measures the degree of sectoral specialization of the province. It is essentially a concentration index based on employment data on 22 two-digit manufacturing sectors, obtained by computing the integral of a Lorenz curve (see the Appendix). Similar indices have been interpreted by Glaeser et al. (1992) and Henderson et al. (1995) as indirect measures of the importance of Marshallian externalities. The third variable is related to firms' average size. It indicates whether local production plants are small or large with respect to the nation, taking into account the sectoral composition of employment (see Appendix). This size index has been taken in the literature as measuring the degree of local competition (see Gleaser et al. 1992).

TABLE 8 - GROWTH OF PROVINCES AND INDUSTRIAL DISTRICTS

	Log Manufacturing employment growth (1971-1991)		Log Total employment growth (1971-1991)		Log Value added growth (1971-1990)		Log Per capita value added growth (1971-1990)	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Intercept	0,045	0,145	0,099	-0,052	3,168	3,180	3,179	3,192
Log (Activity rate 1971)			-0,048	-0,170				
			(0,096)	(0,117)				
Log (Per capita income 1971)	-0,683**	-0,680**	-0,438**	-0,365**	-0,586**	-0,664**	-0,565**	-0,600**
	(0,148)	(0,157)	(0,123)	(0,128)	(0,082)	(0,078)	(0,066)	(0,068)
Log (Sectoral composition index)	0,345	0,257	-0,160	-0,238	0,065	0,061	0,324*	0,314
	(0,422)	(0,443)	(0,245)	(0,257)	(0,229)	(0,220)	(0,185)	(0,191)
Average size of firms 1971		-0,017		0,060		0,134**		0,059
		(0,123)		(0,055)		(0,042)		(0,036)
Specialization index (1971)		-0,159		-0,257**		-0,355**		-0,174*
		(0,229)		(0,139)		(0,110)		(0,095)
Employment share of industrial districts (1971)	0,259**	0,243**	0,176**	0,224**	0,165**	0,191**	0,115**	0,126**
	(0,109)	(0,143)	(0,065)	(0,072)	(0,054)	(0,050)	(0,043)	(0,044)
Geographical dummies								
Center and Northeast	0,105	0,109	0,073*	0,072	-0,019	-0,014	-0,058**	-0,055*
	(0,065)	(0,067)	(0,038)	(0,038)	(0,036)	(0,033)	(0,029)	(0,028)
South	0,026	0,042	0,007	0,005	-0,266**	-0,197**	-0,336**	-0,305**
	(0,109)	(0,111)	(0,070)	(0,069)	(0,057)	(0,054)	(0,046)	(0,047)
N	94	94	94	94	94	94	94	94
Adjusted R2	0,418	0,409	0,507	0,518	0,435	0,534	0,524	0,545

Numbers in parentheses are standard errors

* : 10% significance level; ** : 5% significance level.

Table 8 presents the results of the regression analysis. For each dependent variable we present two regressions, the former one including only the sectoral composition index and the industrial districts index on the right hand side, the latter including all the explanatory variables, i.e. the variables just mentioned plus the specialization and the size indices.

The main result is that there is quite strong and consistent evidence that industrial districts have favored both employment and value added growth. Provinces where the share of employment in industrial districts is higher experienced a significantly higher growth rate according to all indicators. This result holds true irrespective of whether the size and the specialization indices are included in the regression, and remains true also in the general regression of Table 11, where social and education variables are included. Contrary to the findings of Glaeser et al. (1992), this suggests that Marshallian externalities are important for growth.

By contrast, the effect of the other indices is weak or ambiguous. Let us consider these indices in more detail. The coefficient of the sectoral composition index is statistically significant at the 10% level in one regression only. The sign is positive for manufacturing employment and for the value added measures, but it is negative for total employment. Similar results are obtained in the general regression of Table 11. We conclude that the sectoral composition of an area has little effect on its long-run economic performance.

There is some evidence that the average size positively affects value-added growth, but for the other dependent variables the coefficient is not significant or even negative as is the case for manufacturing employment. Similar results are obtained in a regression not shown here, where the industrial district variable is excluded. We interpret these results as indicating that size *per se* does not have a clear effect on growth. The difference between employment and value added variables could be due to the fact that, as we have already observed in Section 2, large firms have increased productivity, particularly during the eighties, by means of large labor-saving investments.

Lastly, the specialization index has a consistently negative sign and is significant at the 10 % level in three equations out of four, suggesting that a diversified industrial structure is better for growth. This may be due to intra-industry or Jacob-type externalities and is not necessarily in contrast with the evidence on industrial districts, which confirms the importance of inter-industry, Marshallian external effects. There may be many industrial districts coexisting in a single province, so that Jacob externalities could operate mainly between different districts, with Marshallian spillovers acting mainly within the districts. This is consistent with the empirical evidence provided by Brusco and Paba (1997), who observed a sort of geographical contagion effect in the creation of new districts in Italy during the period 1971-1991. In the districts originally specialized in one particular industry, the number of specialized sectors tended to increase, often with no apparent linkage with the original specialization. Furthermore, new industrial districts tended to spring up in the neighborhood of older ones. This contagion effect was less likely in the provinces dominated by large firms, whose economic performance is linked to the fortunes of the industries they were initially exposed to[10].

[10] In Glaeser et al. (1995) the sign of the coefficient of manufacturing share is negative and significant. In the paper this is justified with reference to a vintage capital model: in the US new activities are created in regions initially less dominated by manufacturing. In Italy, the coefficient for the same variable is positive, indicating that the new industrial activities are created where manufacturing is dominant and industrial districts are most represented.

7. **Social capital and growth**

The Italian literature adds a social dimension to the definition industrial district[11]. Becattini (1990, pp.38-39), for example, defines the industrial district as «a socio-territorial entity which is characterized by the active presence of both a community of people and a population of firms in one naturally and historically bounded area». In the district «...community and firms tend to merge», and the local community shows a «relatively homogeneous system of values and views, which is an expression of an ethic of work and activity, of the family, of reciprocity, and of change». These features are consistent with the notion of social capital and civic engagement put forward respectively by Coleman (1990) and Putnam et al. (1993). In the latter work, in particular, it is argued that the good economic performance of the Center and Northeastern part of Italy (the so called Third-Italy) can be explained by the historically higher degree of civic engagement of these regions with respect to the rest of the country.

Although quite well defined in theoretical terms, it is very hard to find empirical evidence of the economic role played by social capital. By its very definition, social capital is an intangible entity that cannot be measured in a direct way[12]. Helliwell and Putnam (1995) developed a composite index that tries to grasp the essential features of social capital, namely civic engagement and the importance of associational life[13]. This index is the result of four distinct indicators taken at regional level: the incidence of preference voting in political elections[14], the electoral turnout in national referenda[15], the newspaper readership, and the importance of sports and cultural associations. Using this index, they find econometric evidence of the importance of social capital for the growth of per-capita incomes in Italian regions during the period 1950-1990[16].

We regressed three of these variables[17] on the four measures of growth at provincial level (see Table 9) and we found statistical evidence for a positive impact only in the case of referendum turnout (1974 referendum on the legalization of divorce). In the case of associations (number of 1982 associations normalized by population), the coefficients are not statistically significant and their sign was contrary to that expected for our measures of employment growth[18]. Lastly, the coefficients for preference voting turn out to be statistically not significant, although with the right

[11] Actually, the social dimension should be included in the statistical algorithm used to identify empirically the districts through the construction of appropriate indexes. However, the lack of finely geographically disaggregated data on social variables forced us to define the districts only with reference to structural data. This difficulty is well known in the Italian literature (see Brusco and Paba 1997), and this is why most work in this area has so far preferred specific case-studies to a more general assessment of the incidence of industrial districts across time and space.

[12] «Social capital (..) is created when the relations among persons change in ways that facilitate action. Physical capital is wholly tangible, being embodied in observable material form; human capital is less tangible, being embodied in the skills and knowledge acquired by an individual; social capital is even less tangible, for it is embodied in the *relations* among persons. Physical capital and human capital facilitate productive activity, and social capital does so as well» (Coleman, 1990, p.304).

[14] «All voters in national elections must choose a single party list, and legislative seats are allocated to parties by proportional representation. In addition, however, voters can, if they wish, indicate a preference for a particular candidate from the party list they have chosen. Nationally speaking, only a minority of voters exercise this 'preference vote', but in areas where the party labels are largely a cover for patron-client networks, these preferences votes are eagerly solicited by contending factions. In such areas, the preference vote becomes essential to the patron-client exchange relationship» (Putnam et al., 1993, 94).

[15] The reason is well explained by Putnam et al.: «the primary motivation of the referendum voter is concern for public issues, perhaps enhanced by a keener than average sense of civic duty, so that turnout for referenda offers a relatively 'clean' measure of civic involvement» (Putnam et al., 1993, 93).

[16] A similar exercise applied to Asia was less successful (Helliwell 1996).

[17] Data on newspaper readership are lacking at provincial level.

[18] This result may be due to the fact that the number of associations is only an imperfect indicator for the extent of associational life. A more accurate index should include the number of members of these associations, but these data are lacking.

negative sign. In sum, as long as we accept the interpretation of electoral turnout as a reliable proxy for civic engagement[19], our estimates provide some evidence of the importance of social capital for local growth. This variable proves to be surprisingly robust even after the introduction of all the variables in the general regressions (Table 11). Its coefficient is always significant, and at 5% level in three out of four regressions. No other variable, except the employment share of industrial districts, presents the same result.

TABLE 9 - GROWTH OF PROVINCES AND SOCIAL CAPITAL

	Log Manufacturing employment growth (1971-1991)	Log Total employment growth (1971-1991)	Log Value added growth (1971-1991)	Log Per capita value added growth (1971-1991)
Intercept	-6,420	-2,277	0,368	0,995
Log (Manufacturing share 1971)	0,004			
	(0,060)			
Log (Activity rate 1971)		-0,038		
		(0,095)		
Log (Per capita income 1971)	-1,010**	-0,585**	-0,75**	-0,739**
	(0,071)	(0,113)	(0,089)	(0,071)
Number of associations 1982 / pop82	-0,034	-0,016	0,012	0,075
	(0,130)	(0,086)	(0,077)	(0,062)
Preference voting 1972	-0,003	-0,002	-0,002	-0,003
	(0,004)	(0,002)	(0,002)	(0,002)
Electoral turnout in referendum 1974	6,956**	2,626**	3,052**	2,406**
	(1,445)	(0,916)	(0,782)	(0,625)
Geographical dummies				
Center and Northeast	-0,006	0,033	-0,067	-0,096**
	(0,071)	(0,045)	(0,040)	(0,032)
South	0,186	0,090	-0,181**	-0,237**
	(0,125)	(0,081)	(0,072)	(0,058)
N	94	94	94	94
Adjusted R2	0,521	0,514	0,472	0,569

Numbers in parentheses are standard errors

* : 10% significance level; ** : 5% significance level.

8. **Electoral behavior and growth**

Besides their particular use in the construction of indicators of social capital, data on electoral behavior can provide other clues in our investigation on the determinants of local growth[20]. The starting point is an empirical observation.

[19] Notice that the electoral turnout data are quite stable over time. There have been other 4 national referenda in Italy in the period under analysis (in 1978, 1981, 1985 and 1987), all of them on important public issues. The behavior of the electorate in the provinces in terms of turnout has been almost the same.

[20] Electoral data may signal the existence of specific political sub-cultures, which may positively affect regional economic performance. This idea has been advanced by Bagnasco and Trigilia (1984) and Trigilia (1986), who argued that a key role in the economic development of the Third Italy during the seventies and eighties was played by the Communist and Catholic sub-cultures. These subcultures «fostered a localist regulation of the small-firm economy through their influence on industrial relations and on the activity of local governments» (Trigilia 1986, p.162). These subcultures were rooted in Emilia-Romagna, in Tuscany and Umbria. In the post-war period, the Communist Party ran the local administrations and had the majority of votes in many provinces of these regions. The Catholics, whose political expression was the Christian Democratic Party, were particularly strong in the Northeast of Italy (Veneto, Trentino, Friuli). All these regions were characterized by the presence of small and medium sized firms, so at least part of the effect of these political sub-cultures on growth is captured by the industrial district variable discussed in the previous section.

There is a positive correlation between the share of votes in the provinces obtained by the *Democrazia Cristiana* (Christian Democratic Party) in 1972 political elections and the growth of the provinces in the following twenty years (+0.45 and +0.51 for the employment variables, and +0.39 and +0.48 for the value added variables). The correlations are particularly strong for the sample of Southern provinces (+0.71 and +0.69 for the employment variables, and +0.55 and +0.61 for the value-added variables). This result does not substantially change if we consider all the general elections held in the twenty years under analysis. Although the electoral consensus to the Christian Democrats slightly declined in this period, its geographical distribution has been quite stable over time[21].

Why is the electoral consensus to this party so strongly correlated with growth ?

From the end of the Second World War till 1993, the Christian Democratic Party was the most important and powerful political party in Italy. During this period, it always governed the country alone or in coalition with other parties. To some extent, this party may have affected the growth performance of the provinces by controlling the geographical distribution of public resources, particularly in the backward South of the country, which has always relied on central government intervention for its economic development. In this context, a crucial role was played by prominent local political leaders, whose behavior may have been in accordance with a sort of geographical variant of the opportunistic model of political cycles (see Alesina, Roubini and Cohen, 1997). In order to be re-elected, the politicians try to affect the realization of public investments or the localization decision of large national firms attracted by the incentive schemes and willing to invest in production plants in the South. In doing so, they not only strengthen their personal power, but they also increase the electoral consensus to their party in the constituencies[22].

This view seems to be supported by data. Until recently, the flow of expenditure in public infrastructures and industrial incentives aimed to support the development of the Southern regions was channeled through a specific institution designed in the fifties, the *Cassa per il Mezzogiorno*. At the provincial level, we observe a positive correlation (+0.38) between the electoral consensus to the Christian Democratic Party and the total amount of expenses of the *Cassa* during the period 1969-90. However, public investments are much more positively correlated (+0.69) with the electoral consensus of powerful local Christian Democratic leaders, as signaled by the amount of personal votes of preference relative to the votes obtained locally by the party in their constituencies in the 1972 political elections[23]. This, for example, is the case of Colombo, De Mita, Gaspari, Cossiga, Andreotti and Forlani[24]. All of these leaders had

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[21] In the South, the correlation between our four indicators of growth and the average share of votes to the Christian Democratic Party in the four political elections of 1972, 1976, 1979 and 1987 is still high: 0.56 and 0.60 for the employment variables, and 0.46 and 0.56 for the value added variables.

[22] In fact, the electoral consensus to the Christian Democratic Party in the 1972 general election is positively correlated (+0.54) with the share of personal votes of preference obtained in the constituency by the most voted Christian Democrat. This might be the way in which the electorate rewards the politicians who favor the development of local areas. Notice that in the long period, the impact on local growth of this opportunistic behavior may be low if there are frequent administration changes, so that political parties may alternate in the government of the country. On the other hand, the effect may be high if the party in office is the same for a long period of time, as it happened in Italy with the Christian Democrats.

[23] As we have seen (see note 14), Putnam et al. (1993) consider preference voting as a signal of patron-client relationships, which are particularly widespread in Southern Italy. In these regions, people often used the vote as an occasion of exchange in order to obtain personal and immediate benefits from the local political leader. Such an exchange is often controlled by criminal organizations, like Mafia in Sicily or 'Ndrangheta in Calabria. From this point of view, the incidence of preference voting -i.e. personal votes of preference given to the candidates of all competing parties- clearly represents a good indicator of the weakness of the civic community and an obstacle to growth. This seems to be confirmed in the sample of Southern provinces, where preference voting is poorly correlated with all the growth measures (even negatively correlated with the growth of manufacturing employment). This type of patron-client relationships, however, explains only part of the electoral behavior in the South. Some politicians may actually have acted in the interest of their constituencies, although with the aim of being re-elected. This is the case of many important Christian Democratic leaders with a strong personal consensus in their constituencies.

[24] In the 1972 political elections, the preference votes of all these leaders accounted for more than 30%, and some of them more than 40%, of the total votes to the Christian Democratic party in their constituencies (the national average was 26%).

several government appointments during the seventies and eighties. They had the power to make decisions able to affect the economic development of their constituencies. In doing so, these leaders acted as *mediators* between the Central government and the aspirations of the local communities (see Mutti 1994)[25].

TABLE 10 - GROWTH AND ELECTORAL BEHAVIOUR

	Log Manufacturing employment growth (1971-1991)	Log Total employment growth (1971-1991)	Log Value added growth (1971-1990)	Log Per capita value added growth (1971-1990)
Intercept	-7,576	-2,987	-0,004	0,776
Log (Manufacturing share 1971)	-0,035			
	(0,054)			
Log (Employment rate 1971)		-0,085		
		(0,078)		
Log (Per capita income 1971)	-0,723**	-0,363**	-0,583**	-0,592**
	(0,137)	(0,103)	(0,077)	(0,067)
Electoral turnout in referendum 1974	7,492**	2,881**	3,092**	2,382**
	(1,265)	(0,770)	(0,676)	(0,585)
Share of votes to Christian Democrats	0,010**	0,007**	0,006**	0,004**
in 1972 political elections	(0,002)	(0,001)	(0,001)	(0,001)
Geographical dummies				
Center and Northeast	0,034	0,068*	-0,030	-0,066**
	(0,060)	(0,037)	(0,034)	(0,030)
South	0,195**	0,102*	-0,164**	-0,266**
	(0,093)	(0,060)	(0,052)	(0,045)
N	94	94	94	94
Adjusted R2	0,624	0,642	0,590	0,603

Numbers in parentheses are standard errors

* : 10% significance level; ** : 5% significance level.

All the above considerations persuaded us to include in the regressions the share of votes obtained in the provinces by the Christian Democratic Party in the 1972 political elections. The higher this share relative to the national average, the higher the probability to get support and aid from central governments, which in the period under analysis were always led by the Christian Democrats. Table 10 presents the results. The electoral strength of the Christian Democrats is positively related to all our indicators of growth, with a significance level of 5%. The *t*-statistics are higher for the employment variables, suggesting that the flow of public expenditures had a positive impact on the job opportunities but little effect on productivity. This conclusion is more evident in the general regressions of Table 11, where all the explanatory variables are included. The coefficients are positive and significant at 5% level for manufacturing and total employment growth, but are not statistically significant for the value added variables, although having the right sign.

[25] However, not all the public resources were efficiently used to foster growth. Many local political leaders controlled part of them in order to maintain a system of patron-client relationships and gain essentially private benefits with little effect on growth. This happened for example, in the provinces of Palermo and Naples and many other provinces of Sicily, Calabria and Campania.

8. **Summary and conclusion**

Table 11 presents the general regression of our dependent variables on most of the explanatory variables analyzed in the previous sections. The adjusted R-square is very high, ranging from a minimum of 0.69 for manufacturing employment growth to a maximum of 0.75 for per-capita value added growth.

TABLE 11 - GROWTH OF PROVINCES

	Log Manufacturing employment growth (1971-1991)	Log Total employment growth (1971-1991)	Log Value added growth (1971-1990)	Log Per capita value added growth (1971-1990)
Intercept	-5.605	-2.125	0.926	2.048
Log (Share of manufacturing employment 1971)	-0.142*			
	(0.082)			
Log (Sectoral composition index 1971-1991)	0.393			
	(0.329)			
Log (Employment rate 1971)		-0.237**		
		(0.087)		
Log (Per capita income 1971)	-0.628**	-0.177	-0.804**	-0.824**
	(0.169)	(0.110)	(0.085)	(0.072)
Percent of population less than 20 years old (1971)	1.099	1.001**	0.856**	-0.518
	(0.606)	(0.358)	(0.312)	(0.263)
Illiteracy rate (1971)	-0.726	-0.547	-2.707**	-2.492**
	(1.024)	(0.700)	(0.534)	(0.449)
Technical education (1971)	4.406	2.125	2.222	3.273**
	(3.428)	(2.082)	(1.801)	(1.516)
Higher education (1971)	-0.804	-0.018	0.853	0.793*
	(1.071)	(0.601)	(0.524)	(0.441)
Employment share of industrial districts (1971)	0.172*	0.186**	0.144**	0.086**
	(0.088)	(0.055)	(0.042)	(0.036)
Electoral turnover in 1974 referendum	5.361**	1.564*	2.021**	1.262**
	(1.334)	(0.793)	(0.682)	(0.574)
Share of votes to Christian Democrats in 1972	0.597**	0.468**	0.192	0.187
political elections	(0.264)	(0.159)	(0.138)	(0.117)
Murders (1969-1971)	-1.065**	-0.682**	-0.240	-0.081
	(0.384)	(0.231)	(0.201)	(0.169)
Labor conflicts (1969-1971)	-0.575**	-0.338**	-0.051	-0.060
	(0.239)	(0.142)	(0.123)	(0.104)
Geographical dummies				
Center and Northeast	0.017	0.055	-0.042	-0.054**
	(0.059)	(0.035)	(0.030)	(0.025)
South	0.242**	0.065	-0.116*	-0.134**
	(0.113)	(0.068)	(0.058)	(0.049)
Number of observations	94	94	94	94
Adjusted R2	0.688	0.726	0.728	0.751

Numbers in parentheses are standard errors
* : 10% significance level; ** : 5% significance level.

The sectoral composition of manufacturing does not have a significant impact on manufacturing employment growth in the long run.

Growth is positively related with initial poverty. The coefficients of per-capita value added imply a speed of conditional convergence much higher than the 2% found in several cross-country works.

Demography affects growth. In a country where labor is not perfectly mobile, the distribution of population by age affects the supply side of local labor markets. Provinces where the fraction of young people is larger experience high employment and value added growth, whereas per-capita value added grows less than average.

Education strongly affects productivity and production, but not employment growth. In contrast with previous cross-country evidence, here data indicate that the illiteracy rate has a large negative effect on productivity and value added. In addition, both higher and technical education foster productivity. By contrast, the effects on employment are small in size and have ambiguous sign.

Different aspects of the social environment may affect growth by promoting or depressing local private enterprise and attracting or keeping away private investment from other areas. Our data indicate that an important role is played by criminality and particularly by murders, which are correlated with organized criminality. Data also suggest that the climate of industrial relations is relevant for growth. Lastly, civic engagement or `social capital', as measured by the electoral turnout proved to be positively related with growth, as argued by previous studies.

There is strong evidence that industrial districts, i.e. small areas characterized by a large number of small firms belonging to the same sector, have favored both employment and value added growth. This suggests that Marshallian agglomeration externalities are important, contrary to previous findings.

Lastly, growth is strongly correlated with the share of votes of the Christian Democratic party in the past political elections. Our interpretation is that important leaders of this party, in order to consolidate their personal power, conveyed large flows of public resources towards their constituencies, thus promoting both growth and electoral consensus for the party.

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Abstract:
Marshallian external economies are usually indicated as the main source of small-scale agglomeration and geographical clustering of firms and industries. The literature on industrial districts, particularly the Italian one, adds a social dimension to this picture. While a large number of studies provide evidence of agglomeration economies, little work has been done in order to estimate empirically the impact of industrial districts on local economic performance. In this paper we examine the effect of industrial districts and a number of social features on the growth of the Italian provinces in the period 1971-1991. We find that local growth, in terms of both income and employment, is strongly affected by the diffusion of specialized industrial districts made up of small and medium-sized firms. Variables indicating social cohesion and civic engagement prove also to be positively related with growth, while crime has a clear negative impact on employment.

Keywords:
growth, industrial districts, social capital **JEL classification**: O47, R12

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APPENDIX 1 - Description of variables

[1] Manufacturing employment growth. Log of gross growth rate of manufacturing employment 1991/1971. Data source: ISTAT, *V Censimento generale dell'industria e del commercio: 25 ottobre 1971*, Roma, ISTAT, 1972 and ISTAT, *VII Censimento generale dell'industria e dei servizi: 21 ottobre 1991*, Roma, ISTAT, 1992. We thank Franco Lorenzini of ISTAT, who has made data comparable.

[2] Total employment growth. Log of gross growth rate of employment in industry and services excluding the public sector 1991/1971. Data source: see [1].

[3] Value added growth. Log of gross growth rate of nominal value added 1990/1971. Data source: Tagliacarne G. (1979), *Il reddito prodotto nelle province italiane nel 1977: serie storica 1970-1976*, Milano, Franco Angeli, and Istituto Guglielmo Tagliacarne (1993), *Il reddito prodotto in Italia: un'analisi a livello provinciale anni 1980-1991*, Milano, Franco Angeli.

[4] Per capita value added growth. Log of gross growth rate of nominal per-capita value added 1990/1971. Data source: see [3].

[5] Manufacturing share 1971. Share of manufacturing employment on total employment in 1971. Data source: see [1].

[6] Sectoral composition index 1971-1991. Ratio of the 'theoretical' manufacturing employment to actual manufacturing employment in 1971, where the former corresponds to the total number of employees that would have been in 1991 if each local two-digit sector had experienced the same growth rate as the nation-wide sector. More formally, let $L_{i,1971}$ and $L_{i,1991}$ be the nationwide employment in the (two-digit) sector i in 1971 and 1991 respectively. Call $l_{i,1971}$ the manufacturing employment in sector i in the province in 1971 and l_{1971} the total manufacturing employment in the province in 1971. Then SCI = $(\sum_i l_i L_{i,1991} / L_{i,1971}) / l_{i,1971}$. Data source: see [1].

[7] Employment rate 1971. Ratio of total employment over population in 1971. Data source: see [1].

[8] Per capita income 1971. Data source: see [3].

[9] Percentage of population aged 20 years or less in 1971. Data source: ISTAT, *XI Censimento generale della Popolazione, 24 ottobre 1971*, Roma: ISTAT, 1972.

[10] Illiteracy rate 1971. Percentage of population aged more than six years who could not read and write according to the census of population of 1971. Data source: see [9].

[11] Technical education 1971. Percentage of population aged more than thirteen years enrolled in a professional or technical course (not giving access to University) during 1971. Data source: ISTAT, *Annuario di statistiche dell'istruzione* Roma: Istat, 1972.

[12] Higher education 1971. Percentage of population aged more than twenty years with a secondary school diploma or university degree in 1971. Data source: see [9].

[13] Employment share of industrial districts 1971. Ratio of employment in industrial districts to total manufacturing employment in 1971. Data source: see [1].

[14] Average size of firms 1971. Indicator of average size of manufacturing firms corrected for the sectoral composition of employment. More formally, let f_i be the number of firms in sector i in 1971. Let Z_i be the national average size of firms in sector i, i.e. $Z_i = L_i / F_i$, where L_i is the nationwide employment and F_i the number of firms in sector i. Then $ASI = l / \sum_i f_i Z_i$, where l indicates the total manufacturing employment in the province in 1971. Data source: see [1].

[15] Specialization index 1971. Index of concentration of manufacturing sectors in 1971. More formally, we ordered sectors in such a way that $l_i / L_i \geq l_{i-1} / L_{i-1}$, where the symbols are as in SCI. Now set $q_i = \sum^i_{k=1} l_k / l$, $i = 1,\ldots,n$, n being the number of sectors, and $q_0 = 0$. Then SPEC = $1 - \sum_i L_i (q_i + q_{i-1}) / L$, where L is total national manufacturing employment. Data source: see [1].

[16] Local associations 1982. Number of local recreational and cultural associations in 1982 normalized by population. Data source: Mortara A., *Le associazioni italiane*, Milano, Franco Angeli, 1985.

[17] Preference voting 1972. Share of preference votes to single candidates in the 1972 general election out of the total of expressible preference votes. Data source: ISTAT, *Elezioni della Camera dei Deputati e del Senato della Repubblica: 7 maggio 1972*, Roma, ISTAT, 1973.

[18] Electoral turnout in 1974 referendum. Ratio of the percentage of voters in the 1974 referendum on divorce legalization to the percentage of voters in the 1972 political elections. Data source: ISTAT, *Annuario di statistiche provinciali*, Roma: ISTAT, 1975.

[19] Share of votes to Christian Democrats in 1972 political elections. Data source: see [17].

[20] Murders. Number of murders in the period 1970-1972 normalized by population in 1971. Data source: ISTAT, *Annuario di statistiche provinciali*, Roma: ISTAT, 1971, 1972, 1973.

[21] Labor conflicts. Hours lost for labor conflicts in manufacturing and service sectors during the period 1970-1972 normalized by population in 1971. Data source: see [20].

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