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FINANCE, HUMAN CAPITAL AND INFRASTRUCTURE: AN EMPIRICAL INVESTIGATION OF POST-WAR ITALIAN GROWTH

by Giovanni Ferri (*) and Fabrizio Mattesini (**)

Abstract

Post-war Italy provides an interesting case to test for recent contributions on economic growth which play down the relevance of physical capital per se and stress its complementarity with infrastructure and less tangible factors such as finance and human capital. In truth, behind the remarkable aggregate performance, substantial public intervention did not heal the relative underdevelopment of the Southern regions. On the contrary, with less generous public transfers, the North Eastern and Central regions (NEC) achieved fast growth thanks to a thick network of small export-oriented light manufacturing firms. Given initial per capita income, we show that growth was higher in provinces with a better initial endowment of "structural" variables proxying for human capital (e.g. education), infrastructure capital and financial structure (e.g. per capita bank branches and the presence of co-operative banks). We also show that a proxy for light manufacturing specialisation in the provinces in 1970 is a good predictor of subsequent growth. Our findings suggest that the initial endowments of these "structural" variables can help explain how the unsatisfactory performance of the Southern economy proceeds hand in hand with very high growth in the NEC.

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1. Introduction[1]

Despite the recent controversy surrounding the theory and empirics of economic growth, consensus has recently emerged in: a) rejecting the simple version of the neo-classical growth model, which predicts that less developed economies will unconditionally catch up, and b) playing down the importance of physical capital while stressing its complementarity with infrastructure and less tangible factors such as finance and human capital.

Post-war Italian growth provides an interesting case to test for these propositions. Italy's overall growth rate has ranked very high, coming second only to Japan's in the seven most industrialised countries, but the remarkable aggregate performance occurred hand in hand with unusual dichotomies which have posed some interesting puzzles to economists.

On the one hand, in spite of substantial public intervention, the growth of the Italian economy did not heal the persistent relative underdevelopment of the Southern regions of the country (Mezzogiorno). Per capita income in the South still lags behind that of the rest of the country, and in the last twenty years especially there has been no evidence of convergence (Cosci and Mattesini, 1995). Considering that the capital intensity in most industrial sectors is higher in the Mezzogiorno than in the rest of Italy, the lack of convergence is a puzzle in the light of traditional neo-classical growth theory (Faini, Galli and

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Giannini, 1992). On the other hand, the strong growth of the North Eastern and Central regions (NEC) has hinged on the development of a thick network of small light manufacturing firms, which have gained and held a niche in the international market for high quality consumer goods; this development was not strongly subsidised by the government and was largely independent of the larger heavy manufacturing corporations that earlier industrialisation had established in the North-Western regions.

Despite considerable interest in the different growth paths followed by the Italian regions, the identification and analysis, at the quantitative level, of the factors that lie behind them are still unsatisfactory. What are the forces behind the huge differences in the development patterns that characterise the aggregate performance of post-war Italy? On the basis of the insights provided by the recent literature on growth, we consider in this paper some proxies of human capital (e.g. education attainment levels), infrastructure capital (e.g. roads, telephones, public services, external economies from agglomeration) and financial structure (e.g. the presence of bank branches in the territory and the presence of particular types of intermediary such as co-operative banks) and investigate their contribution to growth.

We explore a large set of variables presumably linked with future growth for the Italian economy during the period 1951-1990, using the most disaggregated data available. Various other studies - including Cellini and Scorcu (1994), Mauro and Podrecca (1994), Paci and Pigliaru (1995) - have recently addressed this issue using data disaggregated only at the regional level. By using data relating to provinces, however, we can obtain a finer view of local economic growth

and are able to use a richer set of explanatory variables that are potentially related to it. The analysis is performed in the tradition of the cross-sectional studies on growth where growth rates are regressed on initial levels of per capita income and other "structural" variables. The purpose is to identify not only whether a convergence process has taken place, but also whether the provinces which were, at the beginning of the period, more endowed with human capital, infrastructure and a more efficient financial structure have outperformed the other provinces.

The literature on Italian post-war development has largely focused on the issue of North-South dualism. During the 1960s, for example, an interesting discussion revolved around an early study by Lutz (1963) who blamed trade unions for forcing an untimely harmonisation of labour costs across regions, thereby reducing the incentives for firms to locate in the South, while inducing strong migratory flows to the North. Other authors have argued that the major decline in transportation costs in the post-war period, combined with an increase in Southern incomes induced by public intervention, provided an attractive market for companies from outside the region, which displaced local firms (Graziani, 1979; Faini, 1983). Others have focused on the fact that the policy approach adopted by government authorities in the South generated a capital-intensive industrial structure, unsuited to support local entrepreneurship (Del Monte and Giannola, 1978). Economic historians such as Zamagni (1990) have suggested that the massive migration that occurred after World War II greatly deprived Southern provinces of skilled workers. Last but not least, many sociologists and economists agree on the negative impact on local entrepreneurship exerted in the South by organised crime. More recently, the blame for the unsatisfactory development of the Mezzogiorno

has been placed on the low human capital endowment and on the lack of flexibility in the labour market (Bodo and Sestito, 1991; Brunetta and Tronti, 1994). Yet from a socio-economic standpoint, other authors (Trigilia, 1992) have stressed that the massive public transfers from the central government to the Mezzogiorno fostered a rent-seeking attitude while depressing the stimulus to entrepreneurship.

The impressive growth recorded in the North-East and Centre of Italy has also generated a lively debate. The literature underlines two major characteristics of the industrial development in the NEC: a) the difference between the mainly low-technology, labour-intensive light industry found in this area and the high technology, capital intensive heavy industry prevalent in the North-West; b) the predominance of a network of small firms organised in industrial districts. Various possible explanations have been proposed to account for the peculiar type of growth that took place in the NEC. Crivellini and Pettenati (1989) stress that the reduction in transportation costs and the emergence of congestion costs in the North-West may have fostered industrialisation in the NEC. Goodman and Bamford (1989) underline the importance of organising production in industrial districts, typical of the NEC, thereby providing a supportive network for small-scale local entrepreneurs. Barca and Magnani (1989) argue that the emergence of significant rigidities in the unionised segment of the labour market induced large corporation to decentralise their activities, to the advantage of small firms. Moreover, small firms may have gained from the attempts of larger companies to minimise their tax burden at a time of increasing tax rates.

The paper is organised as follows. In Section 1 we review some recent developments in the theory and empirics of

economic growth; in Section 2 we describe the type of analysis we intend to perform and the variables that we will use in our empirical estimations; in Section 3 we report the regressions we performed for the whole sample; in Section 4 we report the same type of regressions when the Centre-North and the South are taken separately; in Section 5 we study the link between our predictors of future growth and performance for the periods 1951-1970 and 1970-1990.

2. Recent developments in the theory and empirics of economic growth

The impressive amount of research devoted in recent years to the theory of economic growth has followed two main directions. On the one hand we can identify the endogenous growth approach based on the seminal work of Arrow (1962), Romer (1986) and Lucas (1988). These models have challenged the neo-classical conclusion that, at the steady state, the rate of growth is determined solely by exogenous parameters such as the rate of population growth or the rate of labour-augmenting technical progress and have shown that economies starting from different initial conditions may develop along parallel or divergent growth paths.

On the other hand various authors (Barro, 1991; Barro and Sala i Martin, 1991, 1992; Mankiw, Romer and Weil, 1992) have endeavoured to develop the implications of the neo-classical paradigm, based on the work of Ramsey (1927), Solow (1956), Cass (1965) and Koopmans (1965). These recent studies concentrate on the transition dynamics of economic systems in their movement toward the steady state and offer an empirical analysis of the predictions that the neo-classical theory provides about the convergence of different economies.

This work shows that neo-classical growth theory may provide a very useful framework for the empirical analysis of factors linked to future growth. One of its most striking propositions is that there is a negative correlation between growth and the initial levels of per capita income, so that if we consider two economies with identical preferences and technologies, the poorer economy will grow faster than the richer. The idea is intuitively very simple and appealing: because of the concavity of the production function, higher stocks of capital imply a lower marginal product, so that economies endowed with a higher stock of capital should grow more slowly than those with a lower stock of capital.

In his various contributions, Barro proposes two concepts of convergence: *absolute* and *conditional*. The first assumes that different economies tend to a uniform steady state and is based on the relationship between the growth rate of per capita income and its initial level. Conditional convergence, on the other hand, considers the possibility that different economies converge to different steady states and that the growth path of an economy may be influenced by other factors beside its initial income level. Empirically, conditional convergence is detected by running regressions in which other variables possibly related to future growth are included together with the initial level of income.

In a cross section analysis of 98 countries for the period 1960-1985, Barro (1991) found that while the simple correlation between per capita growth and the initial level of per capita GDP is close to zero, the correlation becomes significantly negative if measures of initial human capital, (proxied by school enrolment rates) are taken into account. At the cross-country level, this finding has been confirmed by further empirical work (Barro and Lee, 1994; Barro, 1996).

At the regional level however, Barro and Sala i Martin (1991, 1992) found that an important convergence process had taken place among both American states and European regions independently of the initial level of human capital.

There are obviously differences between a cross-country analysis based on the neo-classical model of growth and the study of regional convergence. Although regional differences may be significant, firms and households in different regions within a country have access to similar technologies; they share common tastes and cultural backgrounds and the same institutional set-up and legal system. It is therefore probable that regions converge to similar steady states and that the concept of absolute convergence applies more to regions within a country than across countries. This probability is strengthened by the existence of greater capital mobility across regions than across states, which also has the effect of increasing the speed of convergence.[2]

Regarding Italy, Cosci and Mattesini (1995) have studied convergence in the per capita GDP of the Italian provinces for the period 1951-1990. Their research found a significant correlation between growth rates and the initial per capita GDP levels for the whole period and for almost all sub-periods, but also found that the rate of convergence is much higher if Southern provinces are excluded from the sample and increases even more when the Northern provinces only - excluding also the Centre - are taken into account. This seems to indicate that the convergence process that has taken place in post-war Italy has mainly affected the North-

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[2] It is also possible that the geographical proximity of certain areas may condition the process of growth through spillovers and externalities. For Italy, this issue has recently been addressed by Fabiani and Pellegrini (1997).

Centre areas of the country and that caution is necessary in the use of estimates of the rate of convergence of Italy as a whole to extrapolate predictions about the possible closing of the gap between North and South.[3] Moreover, the conclusions reached by Cosci and Mattesini suggest that, for the Italian economy, differences in the growth process among provinces cannot be attributed only to the relative scarcity of reproducible capital and that the different areas of the country may instead converge to different steady states.

Economic growth is a complex phenomenon. We can however identify three important factors, besides the endowment of reproducible capital, that could have an important effect on growth. The first is human and social capital. Economists long ago recognised the importance of human capital for the process of growth. Kendrick (1976), for example, estimated that over half of the total US capital stock in 1969 was human capital. Rauch (1988) found stronger convergence among countries that had achieved 95 per cent adult literacy and Azariadis and Drazen (1990) found that no country was able to grow quickly during the post-war period without a highly literate labour force. Mankiw, Romer and Weil (1992) showed that the predictions of the Solow model regarding the convergence of standards of living are confirmed if human and physical capital are both taken into account.

The second potentially important factor is the level of infrastructure. Infrastructure may affect growth rates in two important ways. Firstly, it augments the productivity of capital, thereby not only increasing the level of private

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[3] Such a prediction is contained, for example, in Barro and Sala i Martin (1991). These authors, having found a significant rate of convergence for the Italian economy, conclude that dualism between North and South will eventually disappear.

investment in the economy, but also ensuring that this investment is more productive. Secondly, infrastructure gives rise to technical progress by fostering specialisation in particular sectors or technologies. The link between infrastructure and growth has recently been explored, at the empirical level, in a series of papers by Aschauer (1989), Munnell (1990a, 1990b), Hulten and Schwab (1991a, 1991b), in which infrastructure was either considered as an input in the production function or used to explain multi-factor productivity. A cross-country analysis in which infrastructure significantly explains growth was recently proposed by Canning, Fay and Perotti (1992).

The third important factor that could lie behind the growth performance of local economies is the structure of financial markets. The relationship between growth and financial development was investigated in the early seventies by, among others, Goldsmith (1969), McKinnon (1973) and Shaw (1973). More recently, owing mainly to advances in the economics of information and the theory of financial intermediation, the theoretical links between financial structure and development have been analysed by, among others, Greenwood and Jovanovic (1990), Bencivenga and Smith (1991, 1993), Boyd and Smith (1992), King and Levine (1993a). In all these papers the emergence and development of a financial intermediation system have important effects on growth. Financial markets channel investment towards uses with the highest returns, provide liquidity and permit the efficient pooling of risks. All of these activities affect savings and are potentially favourable to capital accumulation. Moreover, financial markets foster specialisation and development in entrepreneurship, as well as the adoption of new technologies. From an empirical point of view the relationship between finance and growth has been

analysed by the World Bank (1989), Gelb (1988), Roubini and Sala i Martin (1991), King and Levine (1993a, 1993b).

3. Some indicators of finance, human capital and infrastructure

In order to verify whether the possible factors outlined above might have helped foster economic growth in the Italian provinces we perform various cross-section econometric analyses over the post World War II decades. We use here the data on value added at provincial level, computed by Istituto Tagliacarne. Output growth is measured by the growth rate of per capita value added. As in Cosci and Mattesini (1995) we have chosen estimation periods for which it was possible to compute growth rates on totally homogeneous data; given the frequent revisions of the GDP series followed by the Italian Statistical Institute (Istat), not all the series relating to the various years are directly comparable. The periods taken into account are 1951-1970, 1970-1990 and 1951-1990.

In this study we follow the tradition of the recent cross sectional studies on growth (Barro, 1991; Barro and Sala i Martin, 1991; King and Levine, 1993b); this consists in regressing growth rates of per capita output on initial output levels and on a series of variables which should reflect the structural characteristics of the local economies.

All the regressors are taken at the beginning of the period.[4] This is due partially to a data availability

[4] In some cases, when only census data were available, we include among the regressors variables evaluated at the date of the Census, which may not coincide exactly with the first year of the period considered.

problem, but mainly to the need to avoid endogeneity problems. Many explanatory variables, in fact, are themselves dependent on growth: if we considered long run averages we would not be able to detect whether these variables "determine" growth, or viceversa. It is important to notice that, by regressing growth rates on initial values of the predetermined variables, the exercise we perform is that of detecting whether such variables are good predictors of economic growth, i.e. whether provinces that had a greater endowment of some kind of non reproducible capital at the beginning of the period performed better than those less endowed. Moreover, by performing regressions for the periods 1951-1990, 1970-1990 and 1951-1990, we are also able to ascertain whether variables that in 1951 did not seem related to subsequent growth did in fact become good predictors of growth as a result of the emergence of subsequent factors.

The forty years we are considering were marked by dramatic changes. The period 1951-1970 was one of extremely vigorous growth, the so-called Italian "economic miracle". The major drive generated by export demand when Italy joined the European Community provided the fuel for extremely fast economic growth. Between the mid 1950s and the early 1960s there was massive migration towards the North-West of Italy. Subsequently, at the beginning of the 1970s, the Italian economy experienced a deep change in productive specialisation and industrial localisation, in the wake of a cluster of events such as the input price shocks, the floating of the currency and the emergence of significant rigidities in the unionised labour market. The emergence of the small and medium-sized enterprises (SMEs) that occurred principally after the beginning of the 1970s was one of the most noticeable signals of this change.

A preliminary analysis of the growth performance of the Italian provinces is useful to highlight the particular characteristics of the post-war development of the Italian economy. Table 1 shows the Italian provinces broken down by geographical area according to whether the growth rate of per capita income in the period 1951-1990 was above (out-performers) or below (under-performers) the national average. As is clear from an inspection of Table 1, 69 out of 88 provinces[5] recorded above average growth rates. It is interesting to notice that the under-performers are concentrated mainly in the North-West, with a few in the Centre. All the North-Eastern provinces registered above average growth rates, while in the Mezzogiorno, only Naples performed below average. This table suggests that some form of convergence occurred in the post-war period. If we consider that the North-West - the "industrial triangle" with vertices in Turin, Genoa and Milan - was the richest area of the country, while the Mezzogiorno was, and still is, the less developed area, we notice a tendency of the poorest areas to grow more.

The most interesting aspect of Table 1 is the striking performance of the provinces in the North-Eastern area of the country and of some in the Centre which are mostly responsible for convergence. As the productive structure of these areas is characterised mainly by a larger share of SMEs, this gives some insight into the crucial role played by these firms in the Italian economy.

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[5] Because of the creation of new provinces in the post-war period the regions of Friuli, Molise and Sardegna have not been broken down into provinces. Thus, the number of provinces we consider is smaller than the actual number.

Table 1

INCOME PERFORMANCE IN ITALIAN PROVINCES 1951-1990

OUTPERFORMERS				UNDERPERFORMERS			
North-West	North-East	Center	South	North-West	North-East	Center	South
Alessandria	Trento	Arezzo	Chieti	Novara		Firenze	Napoli
Asti	Belluno	Lucca	Aquila	Torino		Grosseto	
Cuneo	Padova	Massa-Carr.	Pescara	Vercelli		Livorno	
Bergamo	Rovigo	Pisa	Teramo	Aosta		Terni	
Brescia	Treviso	Pistoia	Molise	Como		Macerata	
Cremona	Venezia	Siena	Avellino	Milano		Pesaro	
Mantova	Verona	Perugia	Benevento	Pavia		Roma	
La Spezia	Vicenza	Ancona	Caserta	Varese			
	Friuli	Ascoli Pic.	Salerno	Genova			
	Bologna	Frosinone	Bari	Imperia			
	Ferrara	Latina	Brindisi	Savona			
	Forlì	Rieti	Foggia				
	Modena	Viterbo	Lecce				
	Parma		Taranto				
	Piacenza		Matera				
	Ravenna		Potenza				
	Reggio-Em.		Catanzaro				
			Cosenza				
			Reggio-Cal.				
			Agrigento				
			Caltanisetta				
			Catania				
			Enna				
			Messina				
			Palermo				
			Ragusa				
			Siracusa				
			Trapani				
			Sardegna				

Before commenting on the regressions, we present partial cross-correlations of some variables (Table 2)[6] that we considered as possible candidates to explain provincial performance. The dependent variable (ΔY), representing our measure of provincial performance, is the growth rate of per capita income. The second variable (Y51) is the level of per capita GDP in 1951. The inclusion of this variable among the regressors in a growth equation is a major characteristic of the most recent empirical literature, which has investigated the predictive power of the neo-classical growth model and the issue of convergence. The utilisation of per capita GDP as a major explanatory variable is indeed derived from the neo-classical growth model: the lower is per capita GDP and therefore the per capita endowment of capital in the economy, the higher is the productivity of capital and the faster is growth.

We then included three other sets of variables, respectively aimed at capturing three different types of capital endowment in the provinces: **human and social capital**, **infrastructure capital**, **and financial structure capital**.

The first set (**human and social capital**) can be subdivided into five subsets regarding specifically: *level of education*, *activity rate of the population*, *skill in non-agricultural labour force*, *skill in agricultural labour force*, *respect for the law*. For the *level of education*, we considered various measures: the illiteracy rate (ILL); the ratio of inhabitants holding a university degree to the total population (UNI); the ratio of students attending professional

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[6] These are limited here to the variables available for 1951. In the regressions we will explore later, however, we include other variables that became available only for 1970 (e.g. PT, CR, HI).

Table 2

PARTIAL CORRELATION BETWEEN SELECTED VARIABLES

	ΔY	Y51	ILL	UNI	ACT	MA	PA	KM	TEL	DP	LE	SE	BRA
ΔY	1	-.62	.27	-.51	.18	-.44	-.37	.01	-.33	-.21	-.37	.28	-.08
Y51		1	-.79	.48	-.16	.80	-.58	.40	.72	.17	.74	.66	.62
ILL			1	-.22	.02	-.72	-.40	-.41	-.73	-.04	-.68	-.71	-.64
UNI				1	-.04	.51	.68	.19	.45	.51	.51	.16	.07
ACT					1	-.13	-.53	.06	.01	-.21	-.18	.03	-.14
MA						1	-.40	.64	.75	.51	.72	.84	.52
PA							1	.13	.42	.23	.56	.11	.30
KM								1	.50	.57	.47	.56	.49
TEL									1	.25	.66	.59	.50
DP										1	.31	.29	-.10
LE											1	.54	.46
SE												1	.49
BRA													1

or technical secondary high schools to total students attending secondary high school (PT).[7]

The first variable (ILL) is correlated with future performance (although not very strongly), but is highly negatively correlated with Y and with other human capital proxies; UNI shows a negative correlation with performance while PT exhibits a positive but weak correlation with future growth.

There seem to be good reasons to think that all these three educational variables might have something to say. Illiteracy may be a really extreme obstacle to participation in organised production,[8] making ILL the educational variable with the highest discriminatory power: indeed, in 1951 the average Italian illiteracy was still 13.6 per cent, and in 1971 illiterates still represented 4.7 per cent of total population, with an average of 9.5 per cent in the South. With regard to attendance at professional and technical high schools (PT), one could argue that this should produce young people more suitable for employment in the service and industrial sectors than schools of other types. We include the variable UNI since higher grade education is a fundamental aspect in the accumulation of human capital. As one moves up the education ladder, however, the existence of a larger number of people with university degrees (UNI) may be less meaningful. It should be remembered that mobility is greater the higher the level of education, making the endowment of people holding university degrees less province-specific; by the same token, mobility should be lowest for the illiterate, who are often relegated to farming, as suggested by the high

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[7] We thank Giorgio Gobbi for suggesting that we consider this variable in the analysis.

[8] We again refer to Rauch (1988), Azariadis and Drazen (1990).

correlation between the illiteracy rate and the share of active people working in agriculture.[9] Analysing the determinants of city growth in the USA, Glaeser, Scheinkman and Shleifer (1995) found that a lower grade education is more important than a higher grade. Notice that we did not include among the regressors variables such as primary and secondary school attendance rates, which are widely used in cross-country regressions (Barro, 1991; Barro and Sala i Martin, 1991). In developed countries, these variables tend to be poor proxies of human capital, as scholarisation has been a primary objective of governments and varies very little among different areas.[10]

The second sub-set, the *activity rate*, contains just one variable: the ratio of active people to total inhabitants (ACT), positively correlated with Y and negatively correlated with future performance. This variable is relevant for three reasons. First, because the very fact of being active signals a person's availability to participate in production; second, because being active frequently entails having undergone some type of screening or training, which makes a person more suited to give a prompt contribution to production; third because it is an indicator of social development since in Italy, as in other European countries, the activity rate has been influenced in the post-war period by the entry of women into the labour force. It is also possible that this variable reflects the past dynamics of a local economy, if the activity rate is influenced by the availability of opportunities[11]

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[9] The correlation across provinces, as computed on 1971 census data, is positive and reaches 0.76.

[10] This fact is consistent with our various unsuccessful attempts to include these variables in the regression.

[11] For instance, according to the hypothesis of the "discouraged worker", the activity rate moves cyclically. Glaeser, Scheinkman and Shleifer (1995) argue that high levels of unemployment may generate negative externalities for future growth; accordingly, high activity rates might generate positive externalities.

which have increased as a result of intense growth. Alternatively, ACT could reflect the degree of social development, particularly the participation of women in production.

For the third sub-set, *skill in non-agricultural labour force*, we considered the share of employees in manufacturing (MA). The idea is that in areas with a strong manufacturing sector it is more likely that an "industrial culture" will emerge, in which skills can be easily transmitted, giving rise to positive externalities for firms. In a way, MA can be thought of as complementing initial income in characterising the ex ante state of the economy in a province.

Regarding *labour skill in agriculture*, we considered, as a proxy, the share of farm land allocated to intensive crops (INT), including vineyards and orchards (i.e. olives, citrus and other fruits). This variable - negatively related to both income variables - can identify more skilled workers, since intensive cultivation usually requires better qualified workers who, on moving away from agriculture, provide a good quality labour force. At the same time, however, these more labour intensive cultures could have benefited less than others from technical progress and could have had the effect of holding more workers back in the primary sector, thereby relating negatively to future performance.[12]

With regard to the last **human and social capital** variable (*respect for the law*), we proxy it by means of the

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[12] It is true, as observed by a referee, that a large part of the migration from agriculture to the other sectors of the economy had already taken place in Italy by 1951. However, this was true mostly for the North-West, whereas employees in agriculture still represented 55 per cent in the North-East, 51 per cent in the Centre and 57 per cent in the South.

number of crimes per capita registered by the courts. Of course, this variable may be biased, since under-reporting is usually more prevalent in areas where the intensity of crimes is higher. As expected, its correlation with performance is negative.

Seven additional variables were introduced in order to account for the endowment of **infrastructure capital**: three refer to *physical infrastructure*, one refers to the *public services*, one refers to *agglomeration*, and the other two attempt to capture *firm size and industrial specialisation*.

For *physical infrastructure* we calculated the number of kilometres of road per square kilometre in the province (KM), the ratio of highway kilometres to total kilometres of roads (HI) and the density of telephone lines (TEL). On the one hand, a higher value of KM and HI presumably means lower transportation costs and identifies provinces better able to engage in trade with others. Referring to the US, Holtz-Eakin and Schwartz (1995) confirm the positive impact of the stock of state government highways on future growth in a state and find that spillover effects from neighbouring state highways are negligible. On the other hand, higher KM and HI might be an obstacle to growth if lower transportation costs cause a displacement of local production of traded goods by more scale-efficient external firms located in more developed areas of the country. The variable KM, although positively related to initial income, does not show a meaningful correlation with performance. The variable TEL is meant to proxy the level of communications services available to firms.

For the provision of *public services* we introduced the share of employees in the Public Administration (PA).[13] On the one hand, we might expect that a higher PA could, ceteris paribus, signal a lower propensity to participate into private sector production. On the other hand, there may be three reasons for PA having a positive relation with performance. The first has to do with the fact that in Italy public sector employees have traditionally enjoyed a shorter working day than private sector workers, prompting many of them to venture into a secondary private activity of their own. A second possible positive effect depends on the fact that a larger share of public sector employment might mean a larger provision of public services, which could foster private sector production. The third link might depend on the fact that a larger PA might go hand in hand with more intense public transfers to the province which, on their turn, could foster local production. According to Rauch (1995) public bureaucracy will have a negative impact on the economy if predatory behaviour prevails, leading to rent-seeking by means of bribes and corruption. On the contrary, a professional bureaucracy focused on career-building in the public sector can foster investment in infrastructure, providing complementary inputs to the private sector. In support of this hypothesis he shows evidence that during the first two decades of the twentieth century a wave of reforms favouring bureaucratic professionality had a positive effect on the building of infrastructure and local growth in the US.

The hypothesis that there might be economies from *agglomeration* - a Marshallian intuition - led us to introduce,

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[13] Considering that this ratio does not take into account the productivity of the public administration, we also constructed the measure of bureaucratic inefficiency proposed by Ayal and Karras (1996). This measure consists of the ratio of our PA to the share of government consumption in GDP. This variable showed no significance in the regressions.

as a proxy, the density of population per square kilometre (DP),[14] which is positively correlated with Y and weakly negatively correlated with performance. A higher density of population, in fact, might imply: 1) lower transportation costs, which would entail increasing returns to scale for productive processes segmented in various stages and split among different productive units; 2) positive externalities from proximity among firms; 3) higher productivity because of more intense specialisation. Against these positive effects, though, higher density might also bring congestion costs, and it is impossible to say *a priori* which of the two hypotheses prevails. The answer can only be given empirically: for instance, referring to the variance of performance among States in the USA, Ciccone and Hall (1993) find that "agglomeration more than offsets congestion effects in denser areas".

We finally introduced two variables aimed at capturing potentially relevant features in *firm size and industrial productive specialisation*. The first variable is given by the share of employees in firms for which the national market (or beyond) is the market of reference (LE) - negatively related to performance but strongly correlated with Y - which may at the same time account for firms' dimensions and specialisation in goods and services that can be traded outside the province. The second variable is the share of active people working in light manufacturing industries (SE) - positively related to both Y and performance - identified as: foods and beverages, textiles and clothing, leather and shoes, wood and furnishing, plastic products, other manufacturing (a minor residual sector that excludes metallic products, mechanics, chemicals and

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[14] The more relevant density in this connection would be that applying to industrial districts which, unfortunately, is not available in the published Census data.

electricity). The intuition here is that provinces endowed with a higher SE were better equipped for future growth as they specialised in types of production in which Italy excelled, characterised by a comparatively low capital/labour ratio in family run SMEs, by high quality products suitable for export and facing a relatively inelastic demand and, it is argued, by intense positive externalities within the industrial districts.[15]

We then consider two proxies of **financial structure capital.** The first one is the number of bank branches in the province (BRA) for every 10,000 inhabitants. This variable is meant to proxy the availability of banking services and, particularly, of loan supply. If capital and banking markets are to some extent segmented,[16] one would expect that the supply of credit to the area might also be limited by the availability of bank branches, which for a long time in Italy were set exogenously by the monetary authority on a discretionary basis. The second proxy is the ratio of co-operative bank branches to total bank branches. An interesting question, in fact, is whether the presence in the territory of a particular type of intermediary is more conducive to growth.

Co-operative banks are institutions whose characteristics particularly suit them to support a local

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15 See, for example, Goodman and Bamford (1989), Pyke, Becattini and Sengenberger (1990), Leonardi and Nanetti (1990).

16 Ample evidence of the persistence of segmentation within the Italian loan market is provided by Faini, Galli and Giannini (1992) - regarding the South *vis-à-vis* the rest of the country - and by Montgomery (1991). According to these papers, the sizeable and permanent spread between lending rates in the South and the rest of the country cannot be entirely explained by the difference in terms of credit risk, but highlight the existence of strong market segmentation. Cottarelli, Ferri and Generale (1995) show that market segmentation, resulting in a higher concentration of supply in Southern provinces, translates into stickier lending rates in the face of monetary policy actions.

productive structure. As argued by Ferri and Mattesini (1995) and Padoa-Schioppa (1996) co-operative banks i) have a better acquaintance with debtors, who are often shareholders of the bank; ii) can more efficiently limit moral hazard, especially in cases of crisis, on account of the continuous flow of high quality contracts and information and the threat of social sanctions iii) tend to build closer customer relationships with borrowers, thanks to the more stable presence of bank managers in the territory. Thanks to their closer ties with the territory, co-operative banks seem thus to have a comparative advantage in the collection and use of information, which is held by recent theories of financial intermediation to be a key contribution of banks to economic activity. The presence of co-operative banks could result in the creation of more efficient local capital markets and the relaxation of the financial constraints applied to newly-established small firms.[17] In this case we would expect the variable COP to show a positive impact on future growth.

4. Cross-section regressions over all provinces and periods

The specification adopted is logarithmic. In order to compare coefficients we transformed all variables, taking them as a ratio of their respective means. We will first present the results for the cross-section regressions over all the provinces and then focus on the differences between Northern and Southern provinces. The concept we utilise in this study is that of conditional convergence. We concentrate therefore on the factors that influence the steady states of different provinces. An in-depth study of absolute convergence can be found in Cosci and Mattesini (1995).

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[17] This hypothesis is supported by evidence in Angelini, Di Salvo and Ferri (1997), Cannari and Signorini (1996).

Table 3 reports the specification search for all the periods considered. For each period, the first column reports a regression which includes all listed variables, while the second column reports the preferred specification.

First, we observe that initial income is negatively related to growth in all the periods considered. This is a robust result indicating that some convergence has taken place among the Italian provinces in terms of per capita income and is consistent with the results of Cosci and Mattesini (1995) who find an important process of convergence in Italy, which was also noticed by Barro and Sala i Martin (1991) in their study of European regions.

Second, our *a priori* assumption that ILL should be the most relevant among the education variables is confirmed, while higher education makes a worse proxy of human capital in the provinces because it is less province specific, owing to mobility. UNI, though hardly significant, shows an unexpected negative sign. This negative sign might suggest that this variable captures some additional convergence effect - i.e. a non linear relation - with respect to the initial situation. The variable PT exhibits a positive sign in the period 1970-1990.

The variable ACT is positively related to future growth in all periods, and becomes a good predictor of growth in 1970. The proxy for skill in the non agricultural labour force (the share of active people in manufacturing) has a weak and unstable relation with performance, while the proxy for respect for the law (CR) exhibits an unexpectedly positive sign but, since it is not statistically significant, may be discarded.

OLS ESTIMATES OF INCOME PERFORMANCE IN ALL PROVINCES

(White t-statistics in absolute value reported in brackets)

Dependent variable: growth rate of real GDP. Independent variables evaluated at the beginning of the period.

	1951-1990		1951-1970		1970-1990	
	(1)	(2)	(1)	(2)	(1)	(2)
CONSTANT	0.000	0.000	0.000	0.000	0.000	0.000
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Y	-0.522	-0.554	-0.512	0.545	-0.878	-0.844
(INITIAL INCOME)	*(8.2)*	*(9.6)*	*(6.9)*	*(5.6)*	*(6.1)*	*(7.0)*
ILL	-0.052	-0.062	-0.053	-0.054	-0.088	-0.095
(ILLITERACY RATE)	*(2.3)*	*(3.4)*	*(1.8)*	*(2.0)*	*(4.3)*	*(4.7)*
UNI	-0.044	-	-0.120	-	0.018	-
(UNIVERSITY ATTENDANCE)	*(1.0)*		*(1.9)*		*(0.2)*	
PT	-	-	-	-	0.268	0.314
(PROF.-TECH. SCHOOL ATTENDANCE)					*(1.2)*	*(1.6)*
MA	-0.012	-	0.073	-	0.078	-
(SHARE MANUFACT. EMPLOYEES)	*(0.3)*		*(1.1)*		*(0.9)*	
ACT	0.095	-	-0.094	-	0.775	0.764
(ACTIVITY RATE)	*(0.7)*		*(0.5)*		*(2.7)*	*(2.9)*
PA	0.101	0.051	0.152	0.167	0.227	0.228
(SHARE PUBL. ADMIN. EMPLOYEES)	*(2.9)*	*(1.5)*	*(3.1)*	*(3.5)*	*(2.8)*	*(3.0)*
INT	-0.016	-0.019	-0.029	-0.035	-0.017	-
(SHARE LAND INTENSIVE AGRICULTURE)	*(2.0)*	*(1.7)*	*(2.4)*	*(2.8)*	*(1.0)*	
CR	-	-	-	-	0.052	-
(CRIME RATE)					*(0.9)*	
KM	0.066	0.048	0.058	0.074	0.072	0.048
(KM OF ROADS)	*(2.1)*	*(2.2)*	*(1.4)*	*(3.1)*	*(1.4)*	*(1.1)*
HI	-	-	-	-	0.025	0.024
(SHARE HIGHWAY KM ON TOTAL KM)					*(3.3)*	*(3.1)*
TEL	-0.016	-	-0.103	-0.115	-0.057	-
(PER CAPITA TELEPHONE LINES)	*(0.4)*		*(1.8)*	*(2.6)*	*(0.8)*	
DP	-0.015	-	-0.018	-	-0.044	-
(DENSITY OF POPULATION)	*(0.5)*		*(0.5)*		*(1.2)*	
LE	0.006	-	0.007	-	-0.031	-0.027
(SHARE EMPLOYEES LARGE FIRMS)	*(0.8)*		*(0.7)*		*(1.7)*	*(1.5)*
SE	0.014	-	-0.099	-	0.099	0.140
(SHARE EMPLOYEES LIGHT INDUSTRY)	*(0.4)*		*(1.7)*		*(1.6)*	*(4.1)*
BRA	0.080	0.094	0.058	0.064	0.112	0.118
(PER CAPITA BANK BRANCHES)	*(3.1)*	*(3.8)*	*(1.6)*	*(1.9)*	*(2.3)*	*(2.5)*
COP	0.004	-	0.003	-	0.037	0.029
(SHARE COOP. BANK BRANCHES)	*(0.5)*		*(0.3)*		*(1.8)*	*(1.5)*
R2	0.67	0.66	0.60	0.58	0.64	0.63
Adj. R2	0.61	0.63	0.53	0.54	0.56	0.58
No. obs.	88	88	88	88	88	88

Three out of the four variables capturing the endowment of infrastructure capital - the relative density of provincial roads (KM), highways (HI), and the relative endowment of public infrastructures (PA) - are all good predictors of future performance. From Table 3 we see that KM is a very good predictor of growth for the period 1951-1990, while it is no longer related to future growth if we consider the period 1970-1990. It is interesting to notice that, while for the period 1970-1990 the variable KM is no longer significant in the growth regression, the relative density of highways enters the picture. The variable HI, in fact, not only enters the 1970-1990 regression with a positive sign, but also with a high level of significance.

The indicator for intensive agriculture is negatively related to growth and the density of telephone lines does not show a significant link with future growth across all the provinces. The proxy for public infrastructure has a stable and strong link with performance in each period. Congestion diseconomies emerge over the longer period - but not in the period 1970-1990 - as their proxy (the density of population, DP) exhibits a negative sign and is marginally significant.

Consider now the proxies for firm size and industrial productive specialisation. The share of employees in firms for which the national market (or beyond) is the market of reference (LE) is not significantly related to growth in the period 1951-1990, but has a significant negative relationship in the period 1970-1990. The share of labour force in light manufacturing industries (SE) is not a significant predictor of future growth in 1951, but becomes particularly significant in 1970.

Finally, the financial structure variables show the expected sign and are generally significant. The higher the ratio between the number of bank branches and total population (BRA) the lower future growth. However, even more importantly for our hypothesis, there seems to be some link between the relative density of co-operative bank branches and future performance over the 1970-1990 periods. The fact that this link does not show before 1970 is in line with the expectation that CBs' support for small firms began to become most relevant when the small firm cohorts started their impressive growth. Another expected feature is the diversity of this link between Centre-North and South: this problem will be examined next.

5. Was there a North-South dichotomy in the link between structural factors and growth?

As outlined in the discussion above, there are good *a priori* reasons to think that the mechanism of development and its relationship with non-reproducible capital endowments might have moved along different paths in the various territorial areas of the country. On the one side we have the North-Centre, including both the North-West, the first area to be industrialised, characterised by a higher level of per capita income but a less dynamic economy, somewhat more specialised in heavier industries and with larger firms, and the North-East-Centre. In the latter area, characterised by a relative specialisation in light industry and small-medium sized units of production, faster and more intense per capita income growth occurred in the period of observation. The story is completely different for the Southern provinces where development was unsatisfactory: in this area we find low per capita income and little catching up, a relatively larger presence of the State in terms of both public transfers and

state industries deliberately located there in the hope that they would then foster autonomous economic development. Private industries from outside that moved to Southern Italy (generally attracted by public subsidies) established comparatively large productive units there, whereas local entrepreneurship is traditionally lacking. To focus on this difference seems therefore a compulsory step for our analysis and, indeed, Cosci and Mattesini (1995), in their analysis on provincial per capita income, have already outlined that convergence took place mostly within the North-Centre and only to a lesser extent in the South.

There are 61 provinces in the North-Centre of Italy but, following Cosci and Mattesini (1995), we consider only 59, since the creation of new provinces induced us to merge some of them to avoid distortions in the data. We tried to run the same specification search as that used for all the provinces, although the fit of the conditional convergence equation to subsets of all the provinces is a different exercise than the one performed above, the results of which should be interpreted mostly on qualitative grounds. We will comment briefly on the most relevant differences *vis-à-vis* the full sample.

There are two questions that we can address in this framework. First, and most interesting, we can ask whether the variables related to future growth that were identified over all the provinces carry over for the two sub-areas of the country. Second, we should like to define the difference between the initial endowment of those variables in the Centre-North and in the South.

Regarding the first question, Tables 4 and 5 report results for the cross-section regression specification search within the two sub-samples.

The Chow tests[18] on all the variables reject the hypothesis that Central-Northern and Southern realisations come from the same distribution. The significant negative relationship between initial income and performance suggests that convergence occurred within both the two sub-samples.

Among the human capital variables ILL confirms its relevance, PT is positively but weakly related to growth and UNI is never significant in both areas. The activity rate (ACT) shows a positive correlation with growth in the Centre-North - although significant only in 1970-1990 - whereas in the South the relationship is negative and significant over the longer period.

There is no easy explanation for this, but it is possible that while in the Centre-North ACT signals the accumulation of human capital ready to be utilised in production, in the South it may be heavily influenced by the presence of discouraged workers who leave the labour force because of the difficulty of finding employment. Concerning the proxy for skill in non-agricultural labour force, the link between the share of workers in manufacturing (MA) and performance is unstable and hardly interpretable. In the Centre-North it is always negative, though not significant; for the South the link is positive and significant for the period 1970-1990. Regarding skill in agricultural labour force,

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[18] We performed both an F test and a log-likelihood test on the existence of a structural break between Central-Northern provinces and Southern provinces. While the significance level of the first test was 12 per cent, the significance level of the second test was 1.8 per cent.

OLS ESTIMATES OF INCOME PERFORMANCE IN CENTER-NORTH PROVINCES

(White t-statistics in absolute value reported in brackets)

Dependent variable: growth rate of real GDP. Independent variables evaluated at the beginning of the period.

	1951-1990		1970-1990	
	(1)	(2)	(1)	(2)
CONSTANT	0.060	0.049	0.017	0.059
	(2.5)	*(2.4)*	*(0.4)*	*(1.6)*
Y	-0.589	-0.576	-0.642	-0.610
(INITIAL INCOME)	*(8.8)*	*(11.3)*	*(3.1)*	*(3.0)*
ILL	-0.062	-0.050	-0.079	-0.070
(ILLITERACY RATE)	*(2.4)*	*(2.4)*	*(3.3)*	*(3.0)*
UNI	0.104	-	-0.008	-
(UNIVERSITY ATTENDANCE)	*(1.3)*		*(0.1)*	
PT	-	-	0.287	-
(PROF.NAL-TECH. SCHOOL ATT.NCE)			*(0.9)*	
MA	-0.058	-	-0.005	-
(SHARE MANUFACT. EMPLOYEES)	*(1.2)*		*(0.1)*	
ACT	0.299	-	0.755	0.677
(ACTIVITY RATE)	*(1.2)*		*(1.9)*	*(1.9)*
PA	0.027	-	0.210	0.158
(SHARE PUBL. ADMIN. EMPLOYEES)	*(0.5)*		*(2.3)*	*(2.0)*
INT	-0.011	-	0.009	-
(SHARE LAND INTENSIVE AGRICULTURE)	*(1.2)*		*(0.6)*	
CR	-	-	0.094	-
(CRIME RATE)			*(1.7)*	
KM	0.002	-	0.035	-
(KM OF ROADS)	*(0.1)*		*(0.7)*	
HI	-	-	0.012	0.018
(SHARE HIGHWAY KM ON TOTAL KM)			*(0.9)*	*(1.5)*
TEL	-0.094	-	-0.104	-
(PER CAPITA TELEPHONE LINES)	*(1.4)*		*(1.1)*	
DP	0.056	0.036	0.026	-
(DENSITY OF POPULATION)	*(2.4)*	*(2.0)*	*(0.7)*	
LE	0.012	-	-0.047	-0.061
(SHARE EMPLOYEES LARGE FIRMS)	*(1.0)*		*(1.4)*	*(2.3)*
SE	0.056	-	0.125	0.096
(SHARE EMPLOYEES LIGHT INDUSTRY)	*(1.4)*		*(2.0)*	*(2.2)*
BRA	0.059	0.066	0.145	-
(PER CAPITA BANK BRANCHES)	*(1.5)*	*(2.3)*	*(1.5)*	
COP	0.025	0.015	0.046	0.052
(SHARE COOP. BANK BRANCHES)	*(2.0)*	*(1.4)*	*(2.0)*	*(2.4)*
R2	0.75	0.72	0.68	0.64
Adj. R2	0.67	0.69	0.54	0.58
No. obs.	58	58	58	58

OLS ESTIMATES OF INCOME PERFORMANCE IN SOUTHERN PROVINCES

(White t-statistics in absolute value reported in brackets)

Dependent variable: growth rate of real GDP. Independent variables evaluated at the beginning of the period.

	1951-1990		1970-1990	
	(1)	(2)	(1)	(2)
CONSTANT	-0.047 *(0.8)*	0.004 *(0.1)*	0.060 *(0.4)*	0.050 *(0.8)*
Y (INITIAL INCOME)	-0.406 *(4.6)*	-0.475 *(4.7)*	-1.674 *(5.7)*	-1.906 *(11.1)*
ILL (ILLITERACY RATE)	-0.144 *(2.1)*	-0.096 *(1.8)*	-0.429 *(2.6)*	-0.604 *(5.8)*
UNI (UNIVERSITY ATTENDANCE)	0.011 *(0.1)*	-	0.125 *(0.6)*	-
PT (PROF.NAL-TECH. SCHOOL ATT.NCE)	-	-	0.274 *(0.8)*	0.325 *(1.3)*
MA (SHARE MANUFACT. EMPLOYEES)	-0.217 *(1.1)*	-	0.673 *(2.1)*	0.708 *(3.0)*
ACT (ACTIVITY RATE)	-0.546 *(2.0)*	-0.376 *(3.0)*	0.428 *(0.8)*	-
PA (SHARE PUBL. ADMIN. EMPLOYEES)	-0.003 *(0.0)*	-	-0.073 *(0.3)*	-
INT (SHARE LAND INTENSIVE AGRICULTURE)	0.035 *(1.2)*	-	-0.084 *(1.2)*	-
CR (CRIME RATE)	-	-	0.091 *(0.6)*	-
KM (KM OF ROADS)	0.168 *(1.8)*	0.128 *(2.1)*	0.143 *(1.6)*	0.190 *(2.5)*
HI (SHARE HIGHWAY KM ON TOTAL KM)	-	-	-0.005 *(0.5)*	-
TEL (PER CAPITA TELEPHONE LINES)	0.069 *(2.0)*	-0.235 *(2.51)*	-0.202 *(1.1)*	-0.341 *(2.0)*
DP (DENSITY OF POPULATION)	-0.130 *(1.8)*	-	-0.106 *(1.5)*	-0.157 *(3.7)*
LE (SHARE EMPLOYEES LARGE FIRMS)	-0.010 *(1.3)*	-	-0.027 *(1.1)*	-
SE (SHARE EMPLOYEES LIGHT INDUSTRY)	0.097 *(0.9)*	-	-0.511 *(1.8)*	-0.559 *(2.4)*
BRA (PER CAPITA BANK BRANCHES)	-0.061 *(0.8)*	-	-0.094 *(1.3)*	-0.131 *(2.2)*
COP (SHARE COOP. BANK BRANCHES)	0.001 *(0.1)*	-	0.150 *(1.5)*	0.152 *(2.0)*
R2	0.73	0.66	0.82	0.79
Adj. R2	0.48	0.59	0.57	0.67
No. obs.	30	30	30	30

the share of intensive crops (INT) never shows a significant link.

Among the four proxies for infrastructure capital there are problems in interpreting some of the results. For the Centre-North we can detect no positive or significant link between KM and future performance, while HI becomes a good predictor of future growth in 1970-1990. PA is positively and significantly related to growth only in the last sub-period. Problems emerge in interpreting the results for the South. In particular, TEL exhibits a negative link with performance, and PA shows a negative relationship with growth, although never significant. On the contrary, KM shows a positive and significant relationship with growth for the Southern provinces. This seems to contrast with the hypothesis that lower transportation costs might have hindered growth in the Mezzogiorno.

The initial density of population (DP) has a clear link with growth for the sub-period 1970-1990 for the South, signalling congestion diseconomies, whereas it detects agglomeration economies for the Centre-North over 1951-1990. LE, the proxy for firm size, confirms its pattern, i.e. a negative relationship with growth in the period 1970-1990 for both sub-areas of the country, though significant only for the Centre-North. SE, the proxy for industrial productive specialisation, has a positive relationship with growth - which is significant for 1970-1990 - only for the Centre-North, while among Southern provinces the relationship is significantly negative for the period 1970-1990.

The financial structure variable (BRA) also behaves in the Centre-North in accordance with what we observe for the whole sample, but has an opposite relationship with growth for

the Southern provinces which becomes significant over the sub-period 1970-1990. Analogously, COP is a good predictor of future growth in the Centre-North (for both 1951-1990 and 1970-1990) and in the South (for 1970-1990).

Banking variables in the South are puzzling. The relative density of bank branches bears a weakly negative impact on growth. It is hard to account for this result and a proper answer would certainly call for more thorough analysis. Nonetheless, it is worth noting that the "dependent economy" Southern development hinged heavily on public rather than private financial flows and that Southern banks were notoriously less efficient. The former observation stresses the need to look at public flows of funds: according to Onado, Salvo and Villani (1990) and Fazio (1994) heavy public transfers allowed the South to develop and hold positive net financial assets *vis-à-vis* the rest of Italy, in spite of a persistent and increasing trade deficit. At the same time this means that financial flows did not find enough local opportunities. With regard to the lower efficiency of Southern banks, we should note that they were required to do business in unfavourable conditions: with higher loan risks and losses, with less certainty in judicial procedures and longer loan recovery times.

We will now try to give an answer to the second question that we posed at the beginning of the section. Was there a relevant difference between North and South in terms of the endowments of the factors that we have identified as linked to future growth? Table 6 reports the average over all the provinces, in the Centre-North and in the South, for all the variables that we considered.

Table 6

AVERAGE INITIAL ENDOWMENTS: CENTER-NORTH VS. SOUTH

	1951					1971				
	Italy	Center-North	Growth impact	South	Growth impact	Italy	Center-North	Growth impact	South	Growth impact
ILLITERACY RATE	13.6	7.7	-0.035	25.0	-0.114	5.8	3.1	-0.051	11.3	-0.185
UNIVERSITY ATTENDANCE	0.7	0.7		0.7		3.2	3.1		3.3	
PROF.NAL-TECH. SCHOOL ATT.NCE	38	39		37		57.7	60.9	0.331	51.2	0.279
SHARE MANUFACT. EMPLOYEES	9.2	11.6		4.4		21.2	27.1		9.3	
ACTIVITY RATE	44.0	45.9		39.9		35.0	37.0	0.808	31.4	0.685
SHARE PUBL. ADMIN. EMPLOYEES	5.6	6.1	0.056	4.9	0.045	6.2	5.7	0.210	7.2	0.265
SHARE LAND INTENSIVE AGRIC.TURE	9.7	5.0	-0.010	19.1	-0.037	12.9	8.7		21.5	
CRIME RATE	-	-		-		82.0	77.8		90.5	
KM OF ROADS PER KM^2	0.653	0.773	0.057	0.410	0.030	1.098	1.189	0.052	0.913	0.040
SHARE HIGHWAY KM ON TOTAL KM	-	-		-		0.150	0.169	0.027	0.109	0.017
PER CAPITA TELEPHONE LINES	4.6	5.7		2.3		23.5	25.7		19.1	
DENSITY OF POPULATION	191.0	183.2		207.0		222.4	218.5		230.5	
SHARE EMPLOYEES LARGE FIRMS	8.2	11.5		1.5		14.8	18.3	-0.033	7.7	-0.014
SHARE EMPLOYEES LIGHT INDUSTRY	5.6	6.7		3.3		10.9	13.6	0.175	5.2	0.067
PER 10,000 CAPITA BANK BRANCHES	1.8	2.2	0.115	0.9	0.047	2.3	2.7	0.139	1.5	0.077
SHARE COOP. BANK BRANCHES	22.8	24.0		20.3		26.2	25.6	0.028	27.6	0.031

The differences between the two areas are striking, even though somewhat decreasing over time. In 1951 ILL was 7.7 per cent in the North and 25 per cent in the South, in 1971 it was 3.1 per cent in the Centre-North and still 11.3 per cent in the South. The proportion of graduates in technical high schools in 1971 was 61 per cent in the Centre-North and 51.2 per cent in the South. The ranking of the two areas in terms of PA changed over the period: in 1951 PA was 6.1 per cent in the Centre-North and 4.9 per cent in the South, but in 1971 it was respectively 5.7 and 7.2 per cent. The endowment of roads (KM) in 1951 in the South amounted to 0.41 km of roads per square km of territory while in the Centre-North it was 0.77; and a wide difference can be found also in the amount of telephones.

The financial structure also shows a dual nature: in 1951 there were 2.2 bank branches for any 10,000 inhabitants in the Centre-North and 0.9 in the South; the share of co-operative banks in the South was then well below that in the Centre-North. In 1951 SE was 6.7 per cent in the Centre-North and 3.3 in the South; by 1971 the gap had widened with SE reaching 13.6 per cent in the Centre-North and 5.2 in the South.

LE was obviously higher in the North: in 1951, 11.5 per cent of firms in the Centre-North had the national and international markets as a reference, compared with only 1.5 per cent of firms in the South. However, thanks to public investment and subsidies, the picture had changed by 1971 when LE was 18.3 per cent in the Centre-North and 7.7 in the South; this was shortly before large-scale production entered a period of crisis.

Finally, for each variable significantly entering the two conditional convergence regressions for 1951-1970 and 1970-1990, reported in Table 3, we performed a simple exercise, computing their impact on growth on the basis of the estimated coefficients.[19] Let x_i be the initial endowment for the variable x in the province i and $\underline{x}$ be the average initial endowment for the whole country. Let y_i be the growth rate of per capita income in the province i for the relevant period and by $\underline{y}$ the growth rate of per capita income for the whole country over the same period. As noted in Section 4, each observation entering the regression is taken as the logarithm of the ratio $x_i/\underline{x}$. The estimated coefficients in Table 3, therefore, represent the elasticities of $y_i/\underline{y}$ with respect to each variable. If we multiply these coefficients by $x_i/\underline{x}$ we can actually quantify the impact of each variable for a given province on $y_i/\underline{y}$. In the same way we can compute the impact of each variable on the average province in the Centre-North and in the South. For example, let us suppose that x_i is the illiteracy rate for the average Southern province in 1951. From Table 6 we observe that $x_i/\underline{x}$ = 25/13.6 = 1.84 while the estimated coefficient in the regression for the period 1951-1970 reported in Table 3 is -0.062. The number obtained by multiplying the two (-0.114) gives us the impact of illiteracy on growth, i.e. the fact that the illiteracy rate in the average Southern province was 1.84 times that of the average Italian province meant that growth in the average Southern province was 11 percentage points slower than in the average Italian province.

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[19] Note that, for this exercise, we use the coefficients obtained by the regressions for all provinces. The regressions in Tables 4 and 5 in fact relate to differences among provinces in the Centre-North and the South and it would not be appropriate to use them for comparisons between the two areas.

As we can see from Table 6, the relative scarcity of human capital represented here by the illiteracy rate, had a greater negative impact in the South than in the Centre-North and the relative endowment of infrastructure, proxied by km of roads and highways, and of financial structure, measured by the density of bank branches, had a greater positive impact on growth in the Centre-North than in the South. The relative presence of light manufacturing firms in the Centre-North accounted for 17.5 per cent more growth in the Centre-North in the period 1970-1990 and for only 6.7 per cent more growth in the South. We therefore see that most of the initial endowment of the factors that we identified as related to future performance were unfavourable to the Mezzogiorno. An exception is represented by the endowment of public infrastructure in the period 1970-1990, which seems to have had a greater impact on growth in the South than in the Centre-North, and by the presence of large firms, which had a greater negative impact on the average province in the Centre-North than in the South.

6. Was there a shift around 1970 in the link between structural factors and growth?

Growth in Italy shifted both its location and its specialisation around 1970. As we have seen above, the newly industrialised North-East and Centre became the most dynamic area. At the same time productive specialisation was changing with less emphasis on heavy industries and more on light industries and the service sector. It seems natural to imagine that the relationship between those of our variables that were revealed as good predictors of growth and performance in the Italian provinces may also have changed before and after 1970.

In Table 3 we report the results of the cross-section regressions for both the sub-periods 1950-1970 and 1970-1990.

A comparison between these two sets of results reveals some important differences between the two periods. Educational variables have a clearer link with performance over the second period and the relation between the activity rate and future growth also becomes stronger. What is most interesting to us, however, are the two industrial specialisation variables. LE, which is meant to proxy the share of large firms, is not significantly related to performance in the first period and shows a negative link in the second period. The light industry share in manufacturing (SE) switches from a negative relation with future growth in the first sub-period to a stronger positive relation in the second sub-period. This is consistent with the hypotheses advanced by the various contributions referred to in the introduction, according to which the most dynamic production shifted from heavier manufacturing by large firms towards light manufacturing by small and medium-sized enterprises.

7. Conclusions

This paper analyses the growth process experienced by the Italian economy in the post-war period and makes an attempt to determine the "structural" factors that account for the variability of the growth rate of per capita income across provinces.

In all the regressions performed we found a significant, negative relationship between growth and initial levels of per capita income, thereby confirming the existence of a convergence process for the Italian economy. Moreover, considering the whole sample, we found a significant relationship between per capita income growth and several

indicators of human capital, infrastructure and financial structure.

In particular we establish: i) that human capital, as proxied by the illiteracy rate and the activity rate, is a good predictor of future growth; ii) that the level of infrastructure, proxied by the relative density of provincial roads and highways and by the share of employees in the Public Administration, is positively related to growth; iii) that the proxies for firm size and industrial specialisation become good indicators of future growth, mainly for the period 1970-1990; iv) that the variable measuring the presence of financial intermediaries in the territory has a strong, significant relationship with future growth. All these findings suggest that the wide regional gaps that distinguish the Italian experience cannot be attributed to the scarcity of physical capital, but rather to a series of "structural" aspects that characterise the invisible or non-reproducible capital of an economy, a capital that includes the level of education and training of the labour force, the external economies generated by a network of small and medium-sized firms organised in industrial districts, various types of infrastructure and services also provided by the Public Administration.

The results of our analysis become more difficult to interpret when we divide the sample between provinces in the Centre-North and in the South. While most of the variables that are significant for the whole sample remain highly correlated with future growth in the provinces of the Centre-North, the same cannot be said for the Southern provinces. In our opinion, the peculiar results we obtain for the Mezzogiorno must be linked with the particular experience of the Southern economy which became progressively more exposed

to global competition in the post-war period.[20] Since the South was historically endowed with lower human capital (in particular, higher illiteracy rates and lower labour skills) and with still poorer infrastructure, the opening of markets favoured the displacement of local firms and stimulated their specialisation in non-traded goods and service niches. In fact, it became harder and harder for Southern firms to recoup productivity gaps *vis-à-vis* the North-Centre SMEs, which also enjoyed flexible production and a less unionised labour force, through wage differentials, as their labour market was progressively spoiled by migration and by the demands of subsidised large industrial units locating there.

It is thus no great surprise to find that some of the factors predicting a bright future for Northern and Central provinces paint a dismal picture for the South. This is true in particular of the activity rate (ACT) which in the Centre-North signals the readiness of the population to enter organised production, while in the South, where it is negatively related to growth, it seems to indicate the presence of discouraged workers. Again, the positive impact on performance by Public Administration employment (PA) vanishes in the South, where, in addition, no significant effect of physical infrastructure can be found. Most interestingly, light manufacturing - which proves important for other provinces' performance - turns its back against Southern provinces. In line with our interpretation and controlling for all other outlined variables, the Southern provinces that enjoyed a larger share of light industry manufacturing[21] in 1970 grew significantly less than the others.

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[20] An interpretation of the relative underdevelopment of the South along these lines is provided by Faini (1983) who emphasises the importance of the reduction in transportation costs in opening up the Southern markets. In our analysis this would imply a negative relationship between the endowment of roads and highways and growth, which, however, we do not find empirically.

Banking variables in the South merit separate treatment: the intensity of co-operative credit is a weaker positive factor for performance and the relative density of bank branches has a weakly negative impact on growth. These results are puzzling and deserve further investigation.

Some insight into this issue is offered by Putnam (1993), who shows that the typical Southern community is less conducive to trust and co-operation than observed in North-Centre Italy. This clearly does not make fertile ground for banking, particularly for co-operative banks whose edge over other banks would rest on their access to *peer monitoring* and better information. Such an edge is possible only in communities that provide the proper incentives to co-operation. As stressed by Braverman and Guasch (1989), "peer esteem and social norms serve[d] the role of an effective incentive scheme". Screening and monitoring costs are bound to be higher in the South and it is no surprise that Cannari and Signorini (1996) show that CBs in the North-Centre are more efficient in allocating credit than other banks whereas CBs in the South are less efficient than other banks.

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[21] It would be interesting to ascertain whether these provinces were less favoured by public transfers and subsidies.

References

Angelini, P., R. Di Salvo and G. Ferri (1997), "Availability and Cost of Credit for Small Businesses: Customer Relationships and Credit Cooperatives", *Journal of Banking and Finance*, forthcoming.

Arrow, K. (1962), "The Economic Implications of Learning by Doing", *Review of Economic Studies*, Vol. 29, No. 80, pp. 155-73.

Aschauer, D. A. (1989), "Is Public Expenditure Productive?", *Journal of Monetary Economics*, Vol. 23, No. 2, pp. 177-200.

Ayal, E. B. and G. Karras (1996), "Bureaucracy, Investment and Growth", *Economics Letters*, Vol. 51, No. 2, pp. 233-39.

Azariadis, C. and A. Drazen (1990), "Threshold Externalities in Economic Development", *Quarterly Journal of Economics*, Vol. 105, No. 2, pp. 501-26.

Barca, F. and M. Magnani (1989), *L'industria tra capitale e lavoro: piccole e grandi imprese dall'autunno caldo alla ristrutturazione*, Bologna, Il Mulino.

Barro, R. J. (1991), "Economic Growth in a Cross Section of Countries", *Quarterly Journal of Economics*, Vol. 106, No. 2, pp. 407-43.

_____ (1996), "Determinants of Economic Growth: A Cross-Country Empirical Analysis", NBER Working Paper, No. 5698.

_____ and X. Sala i Martin (1991), "Convergence across States and Regions", *Brookings Papers on Economic Activity*, No. 1, pp. 107-82.

_____ (1992), "Convergence", *Journal of Political Economy*, Vol. 100, No. 2, pp. 223-51.

_____ and J. W. Lee (1994), "Sources of Economic Growth", *Carnegie-Rochester Conference Series on Economic Policy*, Vol. 40, pp. 1-46.

Bencivenga, V. R. and B. Smith (1991), "Financial Intermediation and Endogenous Growth", *Review of Economic Studies*, Vol. 58, No. 2, pp. 195-209.

_____ (1993), "Some Consequences of Credit Rationing in an Endogenous Growth Model", *Journal of Economic Dynamics and Control*, Vol. 17, n. 1-2, pp. 97-122.

Bodo, G. and P. Sestito (1991), *Le vie dello sviluppo: dall'analisi del dualismo territoriale una proposta per il Mezzogiorno*, Bologna, Il Mulino.

Boyd, J. H. and B. Smith (1992), "Intermediation and the Equilibrium Allocation of Investment Capital: Implications for Economic Development", *Journal of Monetary Economics*, Vol. 30, No. 3, pp. 409-32.

Braverman, A. and J. L. Guasch (1989), "Institutional Analysis of Credit Co-operatives", in P. Bardhan (ed.), *The Economic Theory of Agrarian Institutions*, London, Clarendon Press.

Brunetta, R. and L. Tronti (1994), *Capitale umano e Mezzogiorno: i nuovi termini della questione meridionale*, Bologna, Il Mulino.

Cannari, L. and L. F. Signorini (1996), "Localismo, spirito cooperativo ed efficienza: elementi per un'analisi economica delle banche di credito cooperativo", Banca d'Italia, Temi di discussione, No. 274.

Canning, D., M. Fay and R. Perotti (1992), "Infrastructure and Growth", Columbia University, mimeo.

Capra, L., N. D'Amico, G. Ferri and N. Pesaresi (1994), *Assetti proprietari e mercato delle imprese. Vol III. Gli intermediari della riallocazione proprietaria in Italia*, Bologna, Il Mulino.

Cass, D. (1965), "Optimum Growth in an Aggregate Model of Capital Accumulation", *Review of Economic Studies*, Vol. 32, No. 91, pp. 233-40.

Cellini, R. and A. E. Scorcu (1994), "How Many Italics? What Data Show about Growth and Convergence across Italian Regions, 1970-1991", Università di Bologna, Facoltà di Economia, Dipartimento di scienze economiche, Working Paper in Economics, No. 215.

Ciccone, A. and R. E. Hall (1993), "Productivity and the Density of Economic Activity", Stanford University, Hoover Institution, Domestic Studies Program, Working Papers in Economics, No. 6.

Cosci, S. and F. Mattesini (1995), "Convergenza e crescita in Italia: un'analisi su dati provinciali", *Rivista di Politica Economica*, Vol. 85, No. 4, pp. 35-68.

Cottarelli, C., G. Ferri and A. Generale (1995), "Bank Lending Rates and Financial Structure in Italy: A Case Study", *Staff Papers*, Vol. 42, No. 3, pp. 670-700.

Crivellini, M. and P. Pettenati (1989), "Modelli locali di sviluppo", in G. Becattini (ed.), *Modelli locali di sviluppo*, Bologna, Il Mulino.

Del Monte, A. and A. Giannola (1978), *Il Mezzogiorno nell'economia italiana*, Bologna, Il Mulino.

Diamond, D. (1984), "Financial Intermediation and Delegated Monitoring", *Review of Economic Studies*, Vol. 51, No. 166, pp. 393-414.

_____ and P. H. Dybvig (1983), "Bank Runs, Deposit Insurance and Liquidity", *Journal of Political Economy*, Vol. 91, No. 3, pp. 401-19.

Fabiani, S. and G. Pellegrini (1997), "Education, Infrastructure, Geography and Growth: An Empirical Analysis of the Development of Italian Provinces", Banca d'Italia, Temi di discussione, forthcoming.

Faini, R. (1983), "Cumulative Processes of Deindustrialisation in an Open Region: The Case of Southern Italy, 1951-1973", *Journal of Development Economics*, Vol. 12, No. 3, pp. 277-301.

_____, G. Galli and C. Giannini (1992), "Finance and Development: The Case of Southern Italy", CEPR Discussion Paper, No. 674.

Fazio, A. (1994), "Alcuni caratteri dell'economia e del sistema bancario meridionali, Banca d'Italia, Documenti, No. 460.

Ferri, G. and F. Mattesini (1995), "Accounting for Local Economic Growth: Can Cooperative Banks Make a Difference?", paper presented at the 2nd Conference on Economic Integration and Regional Gaps, Santa Margherita di Pula (Cagliari), May 26-27.

Gelb, A. (1988), "Financial Policies, Efficiency and Growth: An Analysis of Broad Cross-Section Relationships", World Bank, mimeo.

Glaeser, E. L., J. A. Scheinkman and A. Shleifer (1995), "Economic Growth in a Cross-Section of Cities", NBER Working Paper, No. 5013.

Goldsmith, R. W. (1969), *Financial Structure and Development*, New Haven, Yale University Press.

Goodman, E. and J. Bamford (eds.) (1989), *Small Firms and Industrial Districts in Italy*, London, Routledge.

Graziani, A. (1979), *L'economia italiana dal 1945 ad oggi*, Bologna, Il Mulino.

Greenwood, J. and B. Jovanovic (1990), "Financial Development, Growth, and the Distribution of Income", *Journal of Political Economy*, Vol. 98, No. 5-1, 1076-107.

Holtz-Eakin, D. and A. E. Schwartz (1995), "Spatial Productivity Spillovers from Public Infrastructure: Evidence from State Highways", NBER Working Paper, No. 5004.

Hulten, C. R. and R. M. Schwab (1991a), "Is There Too Little Public Capital? Infrastructure and Economic Growth", University of Maryland, mimeo.

_____ (1991b), "Public Capital Formation and the Growth of Regional Manufacturing Industry", University of Maryland, mimeo.

Kendrick, J. W. (1976), *The Formation and the Stocks of Total Capital*, New York, Columbia University Press for NBER.

King, S. and R. Levine (1993a), "Finance and Growth: Schumpeter Might Be Right", *Quarterly Journal of Economics*, Vol. 108, No. 3, pp. 715-37.

_____ (1993b), "Finance, Entrepreneurship and Growth, Theory and Evidence", *Journal of Monetary Economics*, Vol. 32, No. 3, pp. 513-42.

Koopmans, T. C. (1965), "On the Concept of Optimal Economic Growth", in *[Study Week on] The Econometric Approach to Development Planning*, Amsterdam, North-Holland.

Leonardi, R. and R. Y. Nanetti (eds.) (1990), *The Regions and European Integration: The Case of Emilia-Romagna*, London, Pinter.

Levine, R. (1990), "Financial Structure and Economic Development", Federal Reserve System, Board of Governors, International Finance Discussion Paper, No. 381.

Lucas, R. J. (1988), "On the Mechanics of Economic Growth", *Journal of Monetary Economics*, Vol. 22, No. 1, pp. 3-42.

Lutz, V. (1963), *Italy. A Study in Economic Development*, London, Oxford University Press.

Mankiw, N. G., R. Romer and D. N. Weil (1992), "A Contribution to the Empirics of Economic Growth", *Quarterly Journal of Economics*, Vol. 107, No. 2, pp. 407-37.

Mauro, L. and E. Podrecca (1994), "The Case of Italian Regions: Convergence in Dualism?", *Economic Notes*, Vol. 23, No. 3, pp. 447-68.

McKinnon, R. J. (1973), "Money and Capital in Economic Development", Washington DC, Brookings Institution.

Montgomery, J. D. (1991), "Market Segmentation and 1992: Toward a Theory of Trade of Financial Services", Federal Reserve System, Board of Governors, International Finance Discussion Paper, No. 394.

Munnell, A. H. (1990a), "Why Has Productivity Growth Declined? Productivity and Public Investment", Federal Reserve Bank of Boston, *New England Economic Review*, January-February, pp. 3-22.

_____ (1990b), "How Does Public Infrastructure Affect Regional Economic Performance?", Federal Reserve Bank of Boston, *New England Economic Review*, September-October, pp. 11-33.

Onado, M., G. Salvo and M. Villani (1990), "Flussi finanziari e allocazione del risparmio", in Banca d'Italia, *Il sistema finanziario nel Mezzogiorno*, special issue of *Contributi all'analisi economica*.

Paci, R. and F. Pigliaru (1995), "Differenziali di crescita tra le regioni italiane: un'analisi cross-section", *Rivista di Politica Economica*, Vol. 85, No. 10, pp. 3-34.

Padoa-Schioppa, T. (1997), "Il credito cooperativo in Italia: realtà e problemi", in F. Cesarini, G. Ferri and M.

Giardino (eds.), *Credito e sviluppo. Banche locali e imprese minori*, Bologna, Il Mulino.

Putnam, R. D. (1993), *Making Democracy Work: Civic Tradition in Modern Italy*, Princeton NJ, Princeton University Press.

Pyke, F., G. Becattini and W. Sengenberger (eds.) (1990), *Industrial Districts and Inter-Firm Co-operation in Italy*, Geneva, International Labour Office.

Ramsey, F. (1927), "A Contribution to the Theory of Taxation", *Economic Journal*, Vol. 37, No. 145, pp. 47-61.

Rauch, J. E. (1988), "The Question of International Convergence of per Capita Consumption: An Euler Equation Approach", University of California at San Diego, mimeo.

_____ (1995), "Bureaucracy, Infrastructure, and Economic Growth: Evidence from the US Cities during the Progressive Era", *American Economic Review*, Vol. 85, No. 4, pp. 968-79.

Romer, P. M. (1986), "Increasing Returns and Long-Run Growth", *Journal of Political Economy*, Vol. 94, No. 5, pp. 1002-37.

Roubini, N. and X. Sala i Martin (1991), "Financial Development, the Trade Regime and Economic Growth", NBER Working Paper, No. 4062.

Schwalbach, J. (1994), "Small Business Dynamics in Europe", *Small Business Economics*, Vol. 6, No. 1, pp. 21-25.

Shaw, E. (1973), "Financial Deepening in Economic Development", London, Oxford University Press.

Solow, R. M. (1956), "A Contribution to the Theory of Economic Growth", *Quarterly Journal of Economics*, Vol. 70, No. 1, pp. 65-94.

Istituto G. Tagliacarne (various years), *Il reddito prodotto nelle province italiane*, Milano, Angeli.

Townsend, R. M. (1979), "Optimal Contracts and Competitive Markets with Costly State Verification", *Journal of Economic Theory*, Vol. 21, pp. 265-93.

Trigilia, C. (1992), *Sviluppo senza autonomia*, Bologna, Il Mulino.

World Bank (1989), *World Development Report*, Washington DC.

Zamagni, V. (1990), *Dalla periferia al centro: la seconda rinascita dell'Italia 1861-1981*, Bologna, Il Mulino.

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