38th Congress of the European Regional Science Association, August 28 - September 1, 1998, Vienna.

What determined the uneven development of Europe´s Southern regions?

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Preliminary, short version (July 1998).
Full version of the paper will be available at the congress.

1. Introduction

The development gap of the Southern regions constitutes a major problem for the European Union´s goal of economic and social cohesion. Following a period of catching-up, income convergence of Europe´s Southern regions with the rest of its EU partner regions has in general seriously declined after the mid-70s. However, progress in economic development was rather uneven across Southern regions in that period. Among those areas, which could generate a major upward step in per capita income level, are Portugal´s and Spain´s capital area, the Spanish north-eastern part, the Algarve and the Balearean islands in the Western Mediterranean; but only the Abbruzzo and Sardegna from Italy´s lagging South, and alone the island areas of Greece. In the least developed areas, like the Alentejo, Andalucia, Spain´s central regions, and the Greek mainland - in particular Western and Central Greece, and Epirus - income convergence remained very low, or did not take place at all. In most regions of Italy´s Mezzogiorno as well, it was practically absent.
Why has growth been so different across Europe´s Southern regions? Can we identify common characteristics responsible for slow growth and development, and what distinguishes fast developing regions?
We approach this issue using a growth model where the growth rate of regional per capita output is basically a function of the region´s investment rate and its human capital. Investment comprises private investment destinated at the business sector, and public investment, which creates infrastructures. In addition, per capita output growth is related to the participation rate in economic activity and to the rate of employment in agriculture.

2. Theoretical set-up

The literature of economic growth has provided important arguments on the role of human capital and investment in the growth process. Consequently, a number of empirical growth studies at the country level have shown that those factors are the most decisive determinants of growth and development.

- The rate of private capital formation is an important factor in economic development. Development requires a high rate of investment in order to create economic activities and to raise the technological level of economic production. Poor economies often suffer a low investment rate (lack of local financial ressources, low capital inflows).
- Public investment is required to establish the economic (and social) infrastructure essential for business activities, and hence for economic development. Investment in transport infrastructure, telecommunication, energy supply, and education infrastructure is considered in this case. Poor economies which can initiate high public investment should be able to register a superior growth and development performance.
- Human capital is an important prerequisite to start economic development. The share of enrolment in post-compulsory school level education can be considered as an indicator for human capital. It evidently lags behind in poor regions.
- Low participation in economic activity is a common feature in less developed regions, partly reflecting a low share of female work participation, partly reflecting high unemployment. A low participation rate means idle production factors and hence forgiven growth. It also means that those participating in the work process have to share output with those outside, leading to a lower per capita income in the economy than with a higher participation rate.
- Finally, the share of employment in agriculture is commonly high in less developed regions. In general, value-added in the agricultural sector is below that possible in industrial procution or services. Thus one will not watch a major growth process in

agriculturally dominated regions. In addition, the growth perspectives of those regions are curtailed as agriculture is a contracting sector. As in Western Europe in the 70s, the agricultural regions of the South have faced restructuring in agriculture since the 80s.

We start from the conventional model applied for a conditional convergence process of per capita income, which relates growth to initial income in a past period and a set of other variables:

$$\ln y_{it} - \ln y_{it-\tau} = \beta \ln y_{it-\tau} + X_{it-\tau}\,\delta + u_{it} \qquad (1)$$

where y_{it} is gross value added p.c. in region i in period t, t = 1 ...τ
$X_{it-\tau}$ is a row vector of growth determinants with the coefficient vector δ
β is the coefficient if convergence, and $-1 < \beta < 0$.

If β is negative a region with a low per capita income in period t-τ will have a higher growth rate than the one with a high initial income. In that case convergence would take place. Considering cross-section observations, we will have a panel data model and thus the error term u_{it} should be understood as $u_{it} = \eta_i + \xi_t + \varepsilon_{it}$, where ηi is the individual fixed effect and ξ_t is a period-specific effect (see below in more detail).

Equation (1) is equivalent to

$$y_{it} = \tilde{\beta}\, y_{it-\tau} + X_{it-\tau}\,\delta + u_{it} \qquad (2)$$

where $\tilde{\beta} = 1 + \beta$

Estimating convergence is equivalent to estimating the relationship of y_{it} with its lag and growth determinants in the past period. The convergence equation then becomes a dynamic panel data model.

3. The empirical study

3.1. Data

Our empirical study covers 40 NUTS II level regions from Spain, the Italian South, and Greece. For the other cohesion countries, Ireland and Portugal, the full variable dataset is only available at the country level. This sample of regions is identical with the focus of the European Union´s objective 1 policy.

Each region´s observation covers time series for a period of 20 years (1975-94) on gross value-added per capita, private and public investment share, enrolment in upper secondary education, participation rate in economic activity, and the share of employment in agriculture.

3.2. Main trends and stylized facts

The *private investment* rate of Southern regions, generally speaking, dropped since 1975 and throughout the first half of the 80s, although some individual experiences do not follow this trend. After 1985, private investment rose again, except for the Mezzogiorno regions (and Ireland). At its botton, in the mid-80s, the private investment rate had dropped to 12-17 percent in Greek regions, which registered also the lowest rate of Southern regions during the whole period. For Spanish regions the lowest, 1985-mark was 13-20 percent , raising to 15-25 percent thereafter; Ireland´s investment rate dropped from 25 percent in the beginning of the 80s to 15 percent in the early 90s. Surprisingly, investment in the Mezzogiorno has always been relatively high, with 30-40 percent. It gradually dropped to 25-35 percent in the 90s, still above the other countries.

If we regard per capita gross value-added in 1994 and the average investment rate in a region during the 80s, there is some evidence, however not as convincing as literature suggests, that richer Southern regions had generated higher investment.
The *rate of public investment* was lowest on the Iberian peninsula. Spanish regions and Portugal generated public investment of about 2 percent by the end of the 70s. That rate gradually rose to about 4 percent during the 80s. Greek regions received much higher public investment, amounting to 3-6 percent of GVA in the late 70s and rising to 4-9 percent in the early 90s. Southern cohesion country regions registered a short fall of public investment by the mid 80s (which was also a trough for private investment, but trends moved in the opposite direction, with public investment rising and private declining). In the bottom period of the late 70s, public investment of the Mezzogiorno was the highest of Southern regions, ranging between 2-8 percent. However, the Mezzogiorno´s high public investment share showed a steady trend to decline. In the early 90s it had fallen to 2-4 percent of GVA, the lowest value among Southern regions. Ireland´s falling private investment share in the 80s was accompanied by declining public investment, which went down from 4 percent to 2 percent.
According to our first evidence, the role of public investment in the economic development of Southern regions seems to contradict the predictions of literature. Those regions, which achieved the highest GVA p.c. in 1994, had received the lowest rate of public investment during the 80s, while public investment was highest in the the least developed regions.
Enrolment in upper secondary education (general and vocational), which we use as a proxy for human capital, has reached the highest level in the Italian South and in Spanish regions, partly including also its poorer ones. In 1992, enrolment in upper education accounted for 65-80 percent of the age group in the Mezzogiorno, and 50-80 percent in the Spanish regions. In 1975 the shares were 35-50 percent and 30-55 percent respectively. A similar improvement in educational enrolment was achieved in Ireland, where enrolment climbed from 30 percent in 1975 to 50 percent, and even more in Portugal, where it increased from 10 percent to 40 percent. However, upper education enrolment is clearly still behind in the latter cohesion countries. The smallest change in educational enrolment took place in Greece. Lying at 22-37 percent in 1975, the share first declined from 1976 to 1980 and then rose again to remain rather unchanged since 1985, accounting for 25-40 percent in 1991.
Education seems to be the strongest determinant of a high per capita GVA. We can find a clear positive relation between the Southern regions GVA p.c. in 1994 and their average educational enrolment level in the past 20 years.

3.3. Econometric method

Given that our data set contains time series for each cross-sectional unit, i.e. the regions, we can use a dynamic panel data model to estimate the contribution of each factor to per capita output level and growth and can exploit the rich information of our data set.
The econometric model starts from equation (2) where for convenience we write β instead of $\tilde{\beta}$.

$$y_{it} = \beta\, y_{it-\tau} + X_{it-\tau}\ \delta + \eta_i + \xi_t + \varepsilon_{it} \qquad (3)$$

A fixed effects model is selected, considering the likelyness of regions-specific factors which determine the steady state p.c. output level, in addition to other included explanatory variables. The region-specific effect η_i applies over the whole period for the region, it also accounts for omitted variables. E.g. a region-specific feature which systematically works over

the whole period, but will not be measured by economic variables, is a specific style of regional administration, either of the kind to support economic growth or to impede it.
The time-specific effect ξ_t operates in one period, equally for all units. This effect should be included to eliminate business cycle effects.
The next econometric procedure for a dynamic panel data model requires to take differences in order to eliminate the fixed effects before estimation can be effected.
The econometric model (3) encounters two problems: First, as the dependant variable is explained by an autoregressive term, one faces the problem that the errors ε_{it} will be correlated with y_{it-1}. Second, the other regressor variables cannot be considered as strictly exogenous, there will be some endogeneity, e.g. between output and investment. In the presence of endogenous variable the errors will show some correlation with the variable. These facts have an important impact on the selection of an appropriate estimator. The OLS estimator requires that no such correlation exists, otherwise it is no unbiased estimator. Therefore the LSDV-estimator, used for static fixed effects models cannot be applied.
To cope with the problem of correlation, an instrumental variable approach is required. We have selected a GMM estimation procedure, where one lag of the variable in differences is used as well as all other lags in levels over the whole period. By this construction the GMM estimator will generate more efficient estimates than other instrumental variable estimators, which use only one lagged value as instrument.
Unfortunately, most cross-section analysis of convergence do not duely consider these econometric problems. The estimation presented in this paper will permit to provide some evidence on the sensitivity of convergence coefficients and variable coefficients with the selected estimation procedure.