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1995

PUBLIC CAPITAL AND CONVERGENCE IN THE SPANISH REGIONS[*]

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ABSTRACT

The article analyses the evolution of the differences in economic conditions among Spanish regions from the perspective provided by the recent advances made in economic growth empirics.

Although convergence is usually established in terms of Gross Value Added (GVA) *per capita*, in the case of Spain it is of special interest to break it down into three separate elements: activity rate, employment rate, and productivity of labour. Regional differences in unemployment rates, which persist for long periods of time, are identified as a force against convergence.

After describing the distinction between conditional and non-conditional convergence, the paper considers the role played by the productive structure in establishing regional differences, with special reference to the weight of the agricultural sector and the role of public capital in conditional convergence.

Finally, conditional and non-conditional convergence equations are estimated for the 17 Spanish regions for the 1955-1991 period. The paper concludes that the convergence process is concentrated in the first half of the period (1955-1979) and that both, the productive structure and public capital, had a significant role in the convergence process.

KEY WORDS: REGIONAL CONVERGENCE, PUBLIC CAPITAL

1. Introduction

Spain's political transition to a democratic system, and the intense process of decentralisation which has simultaneously converted it into a quasi-federal state, have revived the discussions about regional development and its role in public policy. In these discussions, new ideas deriving from the empirical renovation of the theory of growth in recent years begin to be present.

With the revival of interest in the problems of long-run growth, a considerable number of recent papers have brought back into fashion the analysis of regional inequalities. The approaches of recent years are novel in their bases, and an interesting analytical renovation has taken place in this field. The centre of attention has been the study of the causes of the convergence or divergence of the conditions of life in different economic areas[1]. A well-established principle of neoclassical growth theory is that economies or regions with identical fundamental parameters[2] should <u>converge</u> in *per capita* income with the passage of time[3]. For this, the regions which initially presented a lower level of income *per capita* should grow at faster rates than the ones which initially presented a higher *per capita* income[4]. In this direction, the notable differences in economic conditions in which the different regions of Spain currently operate are the motive for the analysis carried out below, which attempts to answer the following two questions: a) Have the differences tended to diminish, or on the contrary have the inequalities become more serious with the passage of time? and b) Has the public sector, in its decisions on the localization of investment, conditioned the convergence between regions?

Regional inequalities can be analysed either from the point of view of differences in the capacity to produce goods and services or in terms of the income available to citizens inhabiting different territories. This second approach takes into account different taxation treatments among regions. In this study the first perspective is adopted: to analyse regional

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[1] Barro (1989); Barro and Sala-i-Martin (1991a, b and 1992); Mankiw, Romer, and Weil (1992); Blanchard and Katz (1992); Azariadis and Drazen (1990); Durlauf and Johnson (1992).

[2] Technology, saving rate, population growth rate, and depreciation rate.

[3] The result of convergence is challenged by <u>endogenous growth</u> models. An overall view can be found in Sala-i-Martin (1990-a and -b).

[4] This implication of the theory is called ß-Convergence in the terminology of Barro and Sala-i-Martin (1992).

economic activity, the variable studied being the regional GVA.[5]

The second concept of <u>convergence</u> refers to the dispersion of *per capita* income at a given moment in time. From this perspective, there is convergence if the dispersion diminishes over time[6].

Convergence of the first type (poor economies growing faster than the rich ones) favours convergence of the second type (reduction in the dispersion of *per capita* income or output), but may be cancelled out by any temporary disturbances which cause a transitory increase of dispersion. Typical examples of these disturbances are agricultural shocks (periods of good or bad harvests), which have unequal effects on the regions, these being concentrated in those regions where the agricultural sector is of greater weight.

The article is organised as follows. In section 2 the existence of convergence in GVA among the regions of Spain is illustrated for the period considered, and in section 3 the respective roles played in that evolution by the behaviour of activity and employment rates and productivity are distinguished. Sections 4, 5, and 6 consider how the process of convergence can be conditioned by the structure of production in the various regions and by public investment in infrastructures. In section 7 the empirical results of the testing of this hypothesis are presented. Section 8 is devoted to the concluding remarks.

2. Have the Spanish regions converged in GVA *per capita* ?

The presence (absence) of ß-Convergence among the Spanish regions, understood as faster growth of the initially poorer economies, for the period 1955-1991, is reflected in Graph 1. This answers the question in the affirmative: the regions which in 1955 presented a lower level of *per capita* GVA grew, on average, during the period considered at faster rates than the regions which initially had a higher *per capita* income (the regression line shows a negative slope).

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[5] The source of statistics is *La Renta Nacional de España y su distribución provincial* (The National Income of Spain and its distribution by provinces), published biennially by the *Banco Bilbao-Vizcaya* (BBV) during practically the whole period since 1955.

[6] This concept of convergence is the one used, for example, by Dorwick and Nguyen (1989), and Baumol (1986). In the terminology of Barro and Sala-i-Martin (1992) this type of convergence is called σ-Convergence.

The second concept (σ-Convergence), which sees convergence as the reduction over time of the dispersion (inter-regional inequalities) in GVA *per capita*, is illustrated in Graph 2. The measure of dispersion used is the unweighted standard deviation of the logarithm of the variable.

Indeed, Graph 2 confirms the reduction, over the period as a whole, in regional inequalities, but also illustrates that this reduction took an intense form during the first part of the period, until the late seventies, becoming stagnated over the last decade.

3. How has the dispersion of GVA *per capita* been reduced ?

The evolution of GVA *per capita* can be broken down into the evolution of three variables: activity rate, employment rate, and labour productivity. Let Y = total GVA, N = total population, PA = active population and L = employed population.

$$\text{GVA } per\ capita = Y/N = Y/L * L/PA * PA/N$$

where 　　　　Y/L = labour productivity
　　　　　　L/PA = employment rate
　　　　　　PA/N = activity rate[7]

Or, expressed in logarithmic terms:

$$\ln Y/N = \ln Y/L + \ln L/PA + \ln PA/N$$

In the neoclassical growth model, the convergence of the productivities of the factors (labour and capital) is considered to be the source of convergence in *per capita* output, while the differences in activity and employment rates play no role at all. However, the importance of the variability of the activity and employment rates in Spain is considerable. Consequently, the question which we now formulate is this: Has the convergence in GVA *per capita* been achieved through reductions in the dispersion of each one of the components? or on the contrary, has any of them hindered convergence?

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[7] In fact, the activity rate should refer not to the total population but to the population of working age. The lack of information on the latter variable obliges us to define it on the basis of the total population.

Activity and employment rates

Graph 3 illustrates the dispersion[8] of the activity and employment rates, leading to the following conclusions:

The activity rate, whose dispersion remained relatively stable until the early eighties, contributed positively to the convergence in GVA *per capita* from then onwards, as its dispersion decreased.

The employment rate, which until the early seventies presented a very low degree of dispersion, showed from then onwards a clearly divergent profile, especially pronounced in the period 1971-1985, its dispersion stagnating at a higher level for the rest of the period.

To sum up, of the two components of the breakdown of GVA *per capita*, the activity rate acted in favour of convergence while the employment rate worked in the opposite direction.

The behaviour of the unemployment rate is linked to these two variables and is illustrated in Graphs 4 and 5. The first one uses the standard deviation as a measure of dispersion, while the second corrects by the national average. The first graph indicates that the absolute differences increased significantly as from 1975, whereas the second one illustrates the relative reduction in the dispersion of regional unemployment rates in the context of a growing national unemployment rate.

The behaviour of the unemployment rate must be linked to the development of the population. Until the mid-seventies migration movements were very intense, labour mobility responding to the regional differences in economic conditions. The adjustment provided by mobility enabled inter-regional differences in employment rates to be kept at low levels, as illustrated by Graph 3. The crisis of the mid-seventies affected the different regions in unequal ways, but unlike what happened in the previous period, the differences in unemployment rates did not seem to induce   migratory flows towards the less affected regions[9]. The result has been the persistence or "hysteresis" of the differences in the unemployment rates[10].

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[8] The measure of dispersion used in the activity and employment rates is the coefficient of variation, while for labour productivity the standard deviation of ln is used, as in the case of GVA *per capita*.

[9] See the analysis in Bentolila (1992) on the behaviour of migratory flows.

[10] This behaviour of the unemployment rate in different Spanish regions, in which the differences

The persistence of unemployment rates from the early seventies is shown by Graph 6. In it are presented the average unemployment rates for two sub-periods, 1971-1983 and 1983-1991.

A high degree of correlation can be observed between them: the regions which in the first sub-period (1971-83) showed high average unemployment rates continued in the second sub-period (1983-91) to have high average unemployment rates, while those which initially presented relatively low average unemployment rates maintained this position in the second sub-period considered.

The problem of the persistence of unemployment rates is thus an important factor in the slowing-down of convergence observed in recent years. At the root of it lies the reduction, compared to previous years, in labour mobility which no longer seems to respond to differentials in unemployment rates with the same intensity as it did until the late seventies.

The explanation of this behaviour can be sought in two directions: the situation of the labour market and the consequences of welfare and regional development policies. In the first place, the increase in the unemployment rate at national level has reduced the probability of finding employment in any region, thus restraining migrations. On the other hand, the reduction in mobility must also be associated with the reduction in the cost of remaining unemployed in a particular geographical area as a consequence of the increase in social expenditures and policies of redistribution (including housing policy) and of compensating regional inequalities.

The persistence of differentials in unemployment rates is surely the most notable stylized fact of the last two decades, and its explanation requires a rigorous specific analysis which will not be undertaken here. Since our interest is centred on the role of the accumulation of public capital as promoter of growth, we shall describe the behaviour shown by apparent labour productivity, as it is this variable which is affected directly by the conditions of production and, in particular, by the behaviour of public capital.

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persist for long periods of time, contrasts with those documented for the American economy (see Blanchard and Katz (1992)) where labour mobility leads to differences in unemployment rates being transitory phenomena. Faced with an adverse "shock" in a particular state, the unemployment rate increases temporarily, returning to its long-run level after a relatively short period (from 6 to 10 years). During that period, a fraction of the active population leaves the state and moves to another area where there has been no deterioration in economic conditions.

Labour Productivity

Graphs 7 and 8 illustrate the two concepts of convergence (ß and σ) with reference to the productivity of labour, and enable us to conclude: 1) the process of convergence is more intense in terms of productivities than in terms of *per capita* output, and 2) the stagnation observed in the reduction of the dispersion of GVA *per capita* during the decade of the eighties is maintained when the variable analysed is the productivity of labour.

4. Conditional and unconditional convergence

The neoclassical model of growth for closed economies[11] assumes that those economies which share identical fundamental parameters will converge towards the same level of *per capita* income in the steady state. The key assumption in the result of convergence deriving from the neoclassical model is that technology shows diminishing returns in the factors which are accumulated. If the technology is such that the productivity of the accumulated factors is constant, the growth model predicts absence of convergence[12]. The fundamental parameters which characterize long-run equilibrium can be summed up as preferences, technology, population growth and depreciation rate. Technology can be defined in a broad sense, to include climate, availability of natural resources, productive structure, public capital stock, taxation treatment, etc. This type of convergence is called unconditional convergence. Unconditional convergence implies that, in the long run, regional *per capita* outputs become equal (growing at the same exogenous growth rate).

The existence of differences in outputs *per capita* in the steady state would imply conditional convergence of each country or region towards its own steady state, but not ß-Convergence in the sense of the "poor" growing faster than the "rich". Therefore, if the convergence is conditioned by certain characteristics of the regions, we will only expect to observe ß-Convergence when such characteristics are taken into account.

For its part, the rate of convergence in a closed economy depends fundamentally on the productivity of capital, being slower the closer that technology comes to fulfilling the

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[11] Both in Solow's model (1956) and in the optimizing version of Ramsey-Cass-Koopmans (Ramsey (1928), Cass (1965) and Koopmans (1965)).

[12] This is the implication of endogenous-growth models.

assumption of constant returns in the factors which can be accumulated. In the case of open economies, the mobility of factors and the possibility of greater diffusion of technology tend to increase the rate of convergence[13].

The following sections analyse two of the factors which the literature considers may affect the process of convergence: the productive structure, through the weight of agriculture, and public capital, which has received growing attention in the last few years. Other relevant factors such as differences in human capital have not been considered due to the lack of directly utilizable statistical bases.

5. The productive structure

As has already been indicated, one of the factors which has been considered in the literature to be a cause of differences in the steady state and which therefore hinders the unconditional convergence of the *per capita* outputs in the long run is the difference in productive structures and especially the weight of the agricultural sector in the total product. Further, the explicit consideration of the weight of the primary sector avoids the possibility of introducing biases in the estimation of the rate of convergence due to the existence of correlation between the levels of output *per capita* of the agricultural regions, lower than the average, and possible "shocks" affecting agriculture[14].

Irrespective of whether we express the importance of the agricultural sector in nominal or in real terms, the weight of agricultural GVA in total GVA has undergone a continual process of reduction, more intense in nominal terms than in real terms due to the fall in the relative price of agricultural goods compared, especially, to the service sector, in the period under consideration. This reduction was not, however, of the same intensity in all the regions. Graph 9 reflects the dispersion (measured by the coefficient of variation) of the importance of each sector in the total GVA in the different regions. From it can be seen that

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[13] Under certain assumptions, a greater mobility of factors may act as a "brake" on convergence (for example, if it results in migration of workers with greater human capital from the poor regions to the rich ones).

[14] The possibility that the group of regions in which the weight of the agricultural sector is greatest may remain at lower levels of *per capita* output could be approached by defining "convergence clubs" with different speeds towards their corresponding steady state. This is not the perspective adopted in this study (the small size of the sample acts as a limitation in this case), which maintains the approach of estimating equations of convergence in which the introduction of this variable reflects both differences in steady states and control of sectorial shocks.

the most notable relative differences are found in the agricultural sector while the weight of the industrial sector in real terms tended to equalise during the period under consideration, but the differences in the service sector remained constant, although they were the smallest.

Graph 10 shows the close relationship between agricultural regions and low relative levels of *per capita* output at the start of the period (1955), corroborating the need to include the variable of the weight of the agricultural sector with the aim of perceiving possible differences in steady states and avoiding bias in the estimation of the rate of convergence. This relationship is not observed when the service or industrial sectors are considered. So, the weight of the agricultural sector is the indicator which captures the importance of the productive structure as a conditioning factor of convergence. This will be the hypothesis to be tested in the econometric model below.

6. Public capital

The role of public capital in the process of convergence has received limited attention so far, due in large part to the lack of information available[15]. However, the differences in the provision of public capital between regions may play an important role, similar to that described when analysing the importance of the agricultural sector.

Graph 11 shows how there is a significant positive correlation between the initial public capital-GVA ratio in the period under study (1955-1991) and the real annual growth rate of the GVA *per capita*. In other words, those regions which started with higher public capital-GVA ratios have grown, on average, at faster rates than those regions where the ratio was lower.

In the period under consideration there has also been a reduction of the inequalities in the public capital-GVA ratio. Thus, Graph 12 shows how convergence has occurred in this variable, since those regions which started with lower ratios experienced faster growth rates in them. This decrease in the differences in the public capital-GVA ratio among regions can be appreciated also in Graph 13, which represents the unweighted standard deviation of the logarithm of the variable in the period 1955-1991. In this graph can be appreciated the major

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[15] See in Mas, Pérez and Uriel (1993) and IVIE (1993) the methodology followed in the construction of the series of capital stock used in this study. The estimated capital stock contains road, hydraulic and urban infrastructures, and education and health which represent more than 90% of public investment.

reduction in its dispersion until the early 70s, the increase during that decade and the subsequent reduction during the 80s.

If the differences in the public capital-GVA ratio are a determinant of the differences in the outputs *per capita* corresponding to the steady state, the role of this ratio in the process of conditional convergence will diminish in the same proportion as the inequalities in it have diminished over time. Together with the role of the weight of the agricultural sector, this is the other hypothesis from which the econometric model in the next section will be approached.

7. Empirical results

This section presents the results of the estimation of the equation of convergence, in which the average growth rate of GVA *per capita* during the interval (t,t-T) is given by[16]:

$$(1/T)\log(Y_{it}/Y_{i,t-T})=a-[\log(Y_{i,t-T})](1-e^{-\beta T})(1/T) + \text{other variables} + u_{i,t-T} \qquad [1]$$

where:
Y_{it} is the real GVA *per capita* (in pesetas of 1990) of the region i in the year t.
    T is the length of the period.
    ß is the rate at which output *per capita* converges at its steady state level.
    $u_{i,t-T}$ represents the error term.

Table 1 shows the results of the estimation of equation [1] [17]. The upper part represents the results of the equation of unconditional convergence, while the lower part includes three additional explanatory variables in order to capture any possible differences in the steady state. The first variable considered (Agri i,t-T) reflects the weight, in region i, of agricultural GVA in the total GVA, in the starting year. The second variable considered (log(G/GVA)i,t-T) captures the effect that the stock of public capital of the region i in the starting year have on the growth rate of *per capita* GVA for the period.

In addition, a dummy variable has been introduced into the regressions, in an

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[16] See Barro and Sala-i-Martin (1992).

[17] The method of estimation is that of non-linear least squares. The standard errors are based on consistent estimation to the heteroskedasticity of the matrix of covariances (White, 1980).

attempt to capture the advantages of localization of the regions geographically best situated to take advantage of the growth impulses coming from Europe. Thus, the variable takes the value 1 for the regions of the north-east quadrant of Spain - the Basque Country, Navarra, La Rioja, Aragón, Catalonia, the Balearics and the Valencia region - and Madrid, and value 0 for the remainder. The regions which take value 0 are geographically more "peripheral" with respect to the centre of Europe, a circumstance which may offset the importance of other factors, such as the provision of public capital. By introducing this variable it was intended to verify if geographical positions relative to the European axis of development had already been revealed as significant in the past.

The first line of table 1 shows the results of the estimation of equation [1] for the complete period 1955-1991, and from it can be observed how, when the two additional variables considered are included as well as the regional dummy, the fit improves in all cases and the estimated values of ß increase considerably, from an annual rate of 1.94% in the unconditional convergence equation to 3.49% in the conditional one.[18]

The additional variables are statistically significant and of the expected signs. Thus, the weight of agriculture presents a negative sign indicating that, for the period as a whole, given two regions with the same initial level of GVA *per capita*, the one with the greater weight of the agricultural sector in its productive structure grew more slowly. The stock of public capital in relation to the GVA is also statistically significant and presents the expected positive sign: those regions which were initially better endowed grew at faster rates.

Although the process of convergence is a long-run phenomenon, it is interesting to break the period as a whole down into sub-periods, with the aim of analysing whether the process was uniform over time. For this purpose, the period 1955-1991 was divided into six sub-periods of equal duration: 1955-1961, 1961-1967, 1967-1973, 1973-1979, 1979-1985 and 1985-1991[19]. This subdivision of the sample enables testing whether the process of convergence, as reflected in Graph 2, occurs until the year 1979 and halts thereafter. The results of the estimation of equation [1] distinguishing by sub-periods, also appear in Table 1.

In the unconditional convergence equation (upper part of the table) the rate of convergence is statistically significant in the first four sub-periods considered, there being no

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[18] This rate of convergence is similar to that obtained in Dolado *et al.* (1994).

[19] The GVA for the year 1961 was obtained by interpolating the information corresponding to the years 1960 and 1962.

convergence in the last two (1979-1985 and 1985-1991). The fastest rate of convergence corresponds to the sub-period 1967-1973, with an annual rate of 3.85%.

It can also be observed that the lack of significativity of the parameter ß in the last two sub-periods is merely the statistical reflection of what has already been pointed out in section 2: the convergence of the Spanish regions occurred until the end of the seventies, and has stagnated since then[20].

The introduction of additional variables in the estimation by sub-periods of the conditional convergence equation (lower part of table 1) improves, as before, the results of the fit and increases the estimated rate in all of them. The fastest rate of convergence occurs in the middle two sub-periods (1967-1973, 7.54% p.a. and 1973-1979, 7.04% p.a.)[21].

The negative sign which accompanies the variable (Agri i, t-T) in the estimation for the period as a whole is maintained in all the sub-periods with the exception of the last one, though it is not significant in the last three.

As regards the importance of the public capital-GVA ratio by sub-periods, this variable affects positively the growth rate of GVA *per capita* and is statistically significant (at the 10 per cent level) only in the first two sub-periods considered (1955-1961 and 1961-1967). This result is consistent with that indicated above: the dispersion of the stock of public capital by regions was especially marked in these sub-periods, being appreciably reduced as from the mid-sixties. If provision of public capital becomes uniform among regions, it ceases to play the conditioning role in convergence which justified its consideration. But furthermore, the network feature of most public infrastructures may explain their greater effect on growth in the first phases of development, when they are first being installed, than in later phases when the investment goes towards expanding already existing networks[22].

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[20] If we impose the restriction that the rate of convergence should be equal in each of the sub-periods, the value of ß is 0.024 (with a t-ratio of 5.182). However, the null hypothesis of constancy of ß by sub-periods is rejected (the test of ratio of likelihood, which is distributed as a chi-squared with k degrees of freedom, is $X^2(5) = 19.7762$). The test imposes the restriction of constancy of ß allowing the remaining coefficients of the convergence equation to vary by sub-periods. We do not impose the constancy of the coefficients other than ß since, as Barro and Sala-i-Martin (1992: 232) point out, there is no reason to think that the growth rate attributable to technical progress will be the same in all the sub-periods.

[21] Under the null hypothesis of constancy of ß by sub-periods, ß is equal to 0.0603, the hypothesis of stability not being accepted in this case either.

[22] See Hulten and Schwab (1992) and Mas *et al.* (1993 and 1994a).

The above results show how the process of convergence, whether conditional or unconditional, is not uniform over the whole period studied, 1955-1991, Graph 2 showing how the process occurs until the late 70s and stagnates thereafter. In order to test this, the results of the estimation of the convergence equation for the sub-periods 1955-1979 and 1979-1991 are shown in Table 2.

The upper part of the table reflects the results of the estimation of the unconditional equation. For the sub-period 1955-1979 the rate of convergence is statistically significant with a value of 0.0263. Also, the value of the Chi-squared test (5.3224) allows us to accept the null hypothesis of constancy of the rate of convergence over the sub-period 1955-1979, reaching a value of 0.0228[23]. For the sub-period 1979-1991 the estimated value of ß (0.0005) is not statistically significant, the hypothesis of convergence not being accepted in consequence.

For the case of conditional convergence (lower part of Table 2) an annual rate of convergence of 4.80% is obtained for sub-period 1955-1979, all the conditioning variables being significant and of the expected signs. Again, the null hypothesis of constancy of the rate of convergence over the sub-period 1955-1979 is accepted, the value of ß being 0.0587. For the sub-period 1979-1991 the estimated value of ß is not statistically different from zero, there being therefore no convergence in this sub-period.

8. Concluding remarks

Convergence among the levels of income of the regions is a simple but highly indicative way of evaluating the success of regional development efforts. The use of percentages of the average per capita income of the Community as a criterion for access to European development funds has spread the idea, in that same direction, that the objective pursued is to converge. In the case of Spain, the changing political circumstances (democratisation and decentralisation) have made very lively this debate on the results and the instruments of regional policies in recent years, although the shortcomings of statistics in this country have made it difficult to be objective.

An important part of the regional policy in Spain in this last decade has been the

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[23] Mas *et al.* (1994b), working with periods of 12 years obtain the same results.

discussion as to whether sufficient effort was being put into solidarity between regions, and in particular whether the endowments of public infrastructure of the less developed regions did not hinder their convergence with the richer ones. This last point is relevant because in the 1980s a very intense public investment effort was made, with annual growth rates of the stock of public capital higher than 5%. In these circumstances, discussion centred on both the long term effects of the infrastructures and the possibilities of attracting effective demand to a region in a particular year through expenditure on public works.

Remaining with the long term perspective, with the aid of the better statistical information now available and the concepts of convergence, it is possible to make a more precise diagnosis of regional development in Spain in the last decades. For this purpose, it must first be pointed out that the process of regional convergence in the period 1955-1991 is beyond doubt. Furthermore, it is to be noted that the convergence in labour productivity is somewhat more marked, which means that, in the field of production conditions itself, the regions of Spain resemble each other more. But it is also notable that convergence slowed down in the 1980s.

One of the factors slowing down the convergence process is the greater difficulty of generating sufficient employment in some backward regions. This phenomenon occurred with greater intensity from the mid-1970s when the unemployment rate grew throughout Spain. But the persistence in the 1980s of the high degree of dispersion of the regional unemployment rates, even in sub-periods of recovery such as that of 1986-1991, brought back into debate the effects of the development of systems of social protection in those years. One of their consequences could be the raising of reserve salaries and the reduction of geographical mobility, circumstances which may reduce certain social costs of emigration but which also reduce inter-regional convergence.

The possible trade-off between social protection and convergence is an example of the limited range of one single welfare indicator, even such a powerful one as the level of income. Precisely for this reason, it is important to point out that the evaluation of the results of development policies in terms of convergence cannot be done without taking into account the different circumstances which may influence or condition the process, or may complete its significance.

In this sense, as far as the debate on the role of investment in infrastructures in convergence among income levels, the statistical information now available indicates, first, that there is no generalised relative infra-endowment of the most backward regions. Together with this, the empirical evidence offered in section 7 indicates that the endowments of public

capital made a significant contribution to favouring convergence among the regions, above all in the first part of the period considered. It is thus possible, as empirical analyses of other economies also conclude, that once higher and more homogeneous levels of endowment of infrastructure have been reached, the capacity of public capital to condition convergence becomes limited.

What this conclusion implies for the design of regional development policies is not that infrastructures do not matter, but that their generic capacity to induce a greater rate of relative growth in the poorest regions is limited. Consequently the discussion on the effectiveness of the actions in this direction should be oriented more towards the evaluation of the specific infrastructure projects than towards a general comparison of the endowments of each region.

Another of the indications derived from the empirical analysis is that there may be factors conditioning convergence which are situated in the scope of the private sector and which development policies can help to stir up. The evidence available shows how, in the past, the weight of agriculture conditioned convergence negatively. Although it is not yet a basis of suitable information to enable such evidence to be presented, many economists today think that generic qualification levels (education) and the endowments of specific human resources (above all, business experience and capacity) may currently be the conditioning factors most relevant to breaking out of the peripheral position - not only geographical, but also in access to the development achieved by others - of the poorest Spanish regions. In recent years a certain re-orientation in the design of regional development policies can be appreciated, more explicit attention now being paid to this point of view: the importance of human capital. However, the insufficiency of statistics limit, for the time being, the capacity to analyse its role in the development of the regions during recent decades and to evaluate its importance in terms of empirical regularities.

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