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Summary and Conclusions

Do regions with more competences perform better than others? Are countries with a higher degree of decentralisation economically more successful than centrally governed countries?

The aim of the study “From Subsidiarity to Success: The Impact of Decentralisation on Economic Growth”, commissioned by the Assembly of European Regions (AER) and produced by BAK Basel Economics, is to seek links between the degree of autonomy of a region, or the degree of decentralisation within a country, and economic development. The project has been divided into two parts. The first part describes how to measure decentralisation and presents the results of this measurement. The second part deals with the impact – explored through theoretical and econometric analysis – of decentralisation on economic performance and on the innovation capacity of regions.

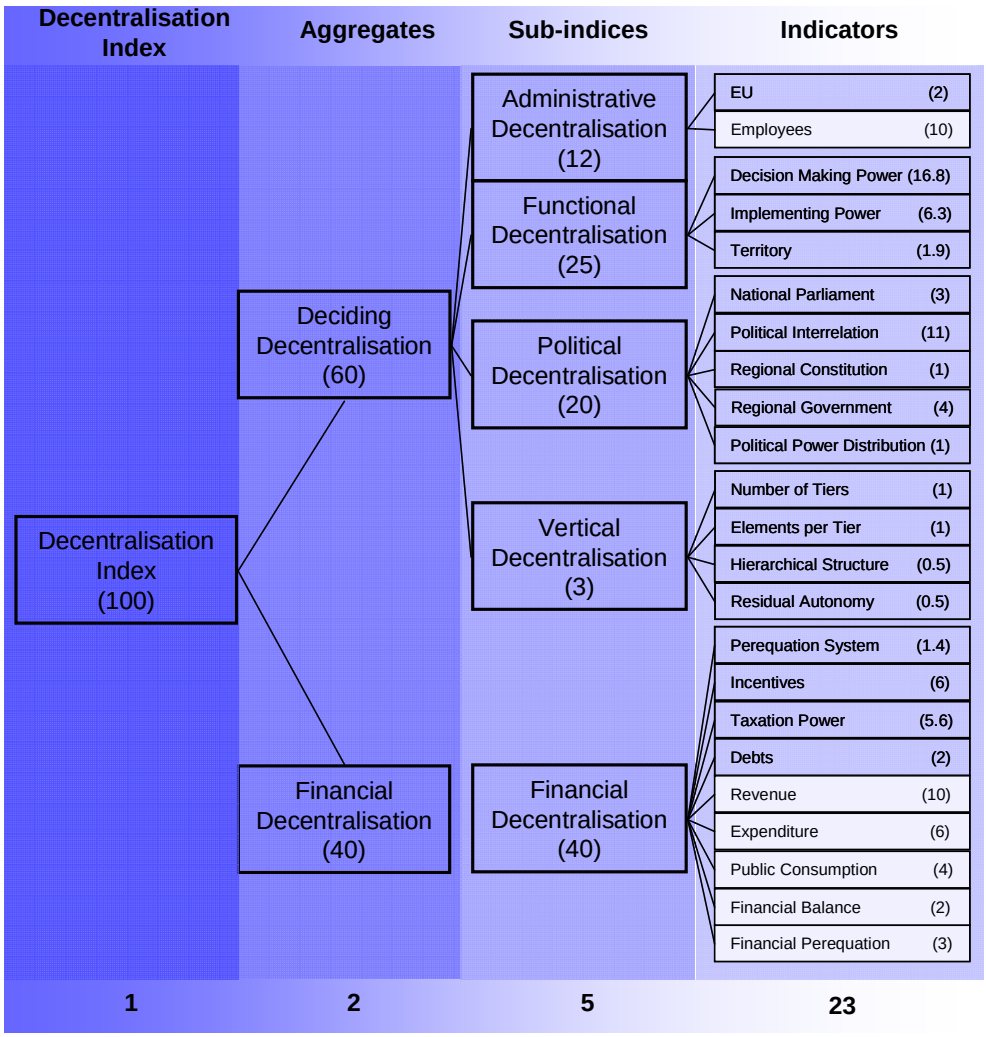
1. How do we measure decentralisation?

To measure decentralisation we must compare the sum of all public competences (competences being used as a synonym for the regulatory power) in a state on the different tiers, from the nation state level on the highest tier down to the municipal tier. **Decentralisation** is the sum of competences sub-national jurisdictions have. The more competences the regions and municipalities have, the more decentralised the country is. This is the country perspective: All competences that are not with the nation state are with lower tiers (regions, municipalities) and add up to decentralisation. From the perspective of a region all competences that are with the region result in its regional autonomy.

Decentralisation cannot be observed or measured directly, since it is multidimensional and complex. However, many single aspects of the vertical organisation of a country can be observed. These observable aspects (185 altogether) are gathered systematically, and the measured information can be aggregated to an **Index of Decentralisation**. Such an index, together with various sub-indices representing different aspects, forms a model of reality.

The Decentralisation Index takes both qualitative and quantitative data into account. While quantitative data have been collected from official international sources, the qualitative data have been collected directly from the regions by means of a questionnaire that has been developed together with four member regions of the AER: Friuli Venezia-Giulia (I), Hordaland (N), Istra (HR), Västra Götaland (S). Data from all the different types of regions within the EU 27, excluding the small countries Luxembourg, Slovenia, Cyprus and Malta, but including the non-EU members Croatia, Switzerland and Norway, have been incorporated.

Figure 1: The Decentralisation Index and its parts

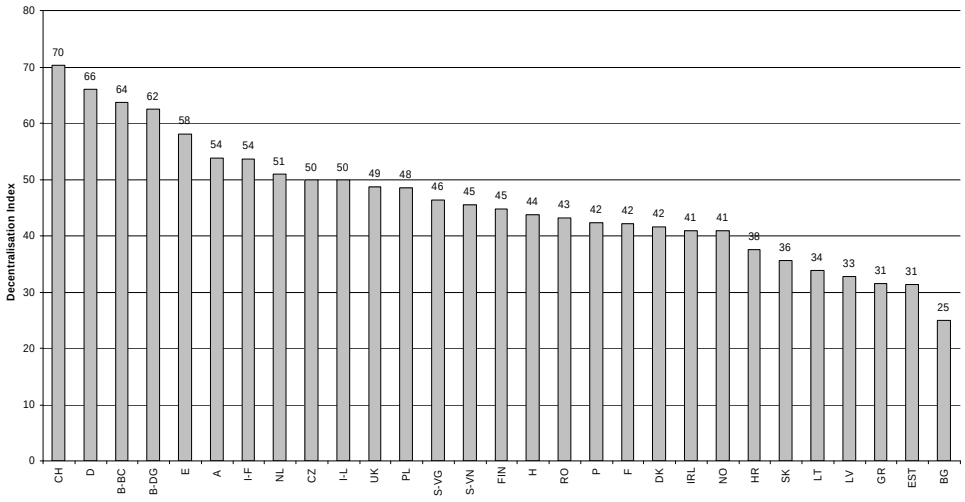


Weights in parenthesis (in %)
Source: BAK Basel Economics

Figure 1 shows the composition of the Decentralisation Index. Financial Decentralisation has a weight of 40 percent and includes primarily quantitative information about the size of revenues and expenditures relative to the central state. However, it also contains qualitative information on the competences in financial matters, such as in the field of taxes (does a region have the power to set the tax base or tax rates?) or public debt (does a region have the right to issue debt?).

Decentralisation of decisions (hereafter referred to as “Deciding Decentralisation”) has a weight of 60 percent in the overall index. Apart from the relative number of public employees it consists of numerous qualitative information on the structure and distribution of public decision-making in a country. There are two main themes: (1) Political decentralisation (weighted 20%) looks at the general influence of the state on the regions and vice versa. It takes, for example, the role of the regions in the national legislation process into account. (2) Functional decentralisation (weighted 25%) indicates for 42 policy fields which tier has the competence to make decisions (legislation) and which tier has the competence (or duty) to implement these decisions (from business development to migration).

Figure 2: Decentralisation Index



Source: BAK Basel Economics

Figure 2 shows the results of the overall Decentralisation Index. It ranges from Switzerland, Germany and Belgium at the top to Bulgaria, Greece and the Baltic states at the bottom. In a few countries (such as Italy or Sweden) there are two

types of regions with different rights and thus different degrees of decentralisation.[1]

The analysis of the various parts of the Decentralisation Index reveals that:
- In most countries the degrees of Deciding and Financial Decentralisation are close to each other. Thus, the correlation between these two aggregates is quite high. This implies that in general the regions have financial means according to their deciding competences (congruence between competences and money).
- The correlation between the qualitative and the quantitative elements of the Decentralisation Index is rather high. However, in some countries (e.g. in Scandinavia) quantitative decentralisation is high, while in other countries (e.g. Greece, Croatia, Romania) qualitative decentralisation is high. Such a result may point to a mismatch between competences and tasks in these countries.
- A comparison of the indicators Decision-Making Power and Implementing Power shows that the regions in all countries under consideration have more implementing than decision-making power. This result is not surprising, because the national tier tends to keep the decision-making power and delegate implementing power to the regions. In some countries (such as Austria, Belgium, Italy) this difference is small. In other countries (e.g. Bulgaria, Croatia, Finland or Greece), there exists a rather significant institutional incongruence.[2]

This is the first time that decentralisation has been measured in such a broad and comprehensive way. The analysis of the data shows that decentralisation can be measured and that there exists a considerable diversity in size and composition of decentralisation among the countries under consideration.

[1] The value shown for Portugal in Figure 1 refers to the autonomous regions (Azores, Madeira); the regions in mainland Portugal only have administrative (and no political) relevance. Moreover, the island of Aland in Finland has slightly more competences than the other regions.

[2] For a further description of the construction and results refer to: From Subsidiarity to Success: The Impact of Decentralisation on Economic Growth, Part 1: Creating a Decentralisation Index, AER 2009.

2. What is the impact of decentralisation on economic performance?

There are several theoretical reasons (so called transmission channels) why decentralisation should have a positive impact on the economic performance of countries and regions. The main argument is **effectiveness**: regions know best the preferences of their citizens and the needs of their companies. When preferences and industry structures are heterogeneous over space (vary from region to region) a single national policy cannot accommodate all the various wishes and needs. It is generally agreed that regional solutions (ie lower tiers of government) can do that most effectively.

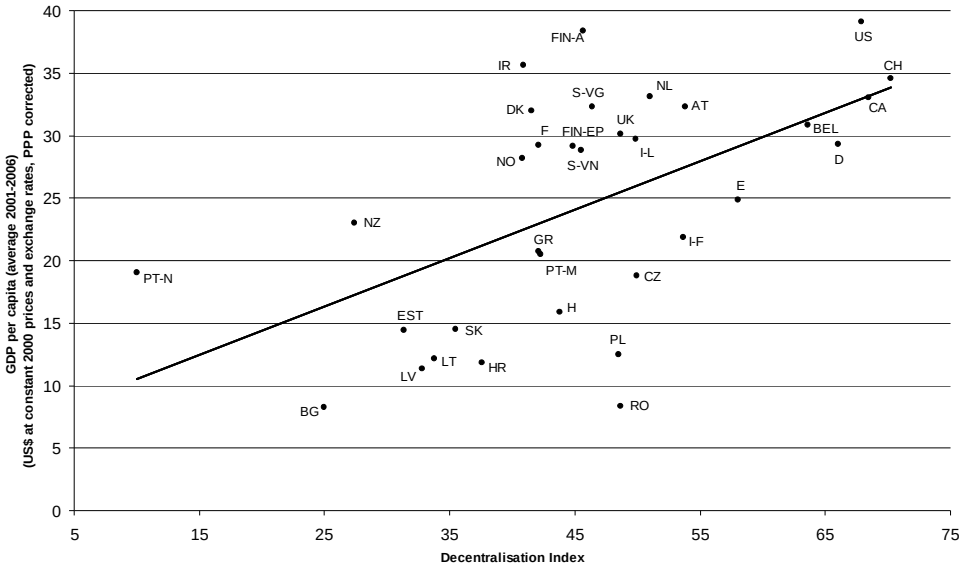
The other factor that boosts economic growth is **efficiency**: Lower tiers know regional circumstances and markets better. They can also provide public services at lower costs. However, there are two points to be considered in favour of centralised solutions: (1) Economies of scale: when there are high fixed costs or decreasing marginal costs (e.g. legal system, army, nuclear research) centralised solutions will be cheaper. (2) Spatial externalities (spillovers): when the provision of a regional public service affects people in other regions, central solutions will be more efficient (e.g. high-speed train systems, large airports). The size of these two effects has to be evaluated separately for each policy field in order to find the best vertical organisation. But in many policy fields, the lower tiers of government have been found to be the most efficient.

For the analysis of the relation between decentralisation and economic performance of regions and countries, the econometric method of **multiple cross-section regression** has been applied.[3] The purpose of this method is to show which factors help to explain the variance in economic performance among the different countries and regions under consideration. The main question of investigation is whether decentralisation – and if so, which dimension of decentralisation – provides a statistically significant contribution to explain the economic performance of regions and countries.

[3] The regression equation takes the following form:
Performance = $\alpha + \beta 1*X1 + \beta 2*X2 + \beta 3*X3 + \ldots + \gamma 1*Z1 + \gamma 2*Z2 + \gamma 3*Z3 + \ldots + \varepsilon$
The Greek letters denote fixed but unknown parameters, apart from ε which is an error term, the X's are various economic and political control variables, the Z's are decentralisation indicators. The equation is estimated using the method of ordinary least squares.

For the empirical part of the analysis **two data sets** were used: The first data set contains 29 countries (four of which have two different types of regions),[4] the second data set contains 234 regions in 16 Western European countries (from the highest politically relevant regional tier). Economic performance is measured both by GDP per capita and GDP growth.

Figure 3: Decentralisation and GDP per capita



Source: BAK Basel Economics

Figure 3 shows a positive correlation between the Decentralisation Index and GDP per capita as a general measure of economic welfare. Since such a unilateral or mono-causal explanation may be misleading, table 1 shows the estimation results from the regression analysis. [5]

In both the country and the regional data set, the Decentralisation Index is clearly

[4] The 29 countries are EU 27, excluding the small countries Luxembourg, Slovenia, Cyprus and Malta, but including non-EU members Croatia, Switzerland and Norway, as well as the USA, Canada and New Zealand. As Finland, Italy, Portugal and Sweden have two types of regions, the number of observations is 33.

[5] For further empirical results refer to: From Subsidiarity to Success: The Impact of Decentralisation on Economic Growth, Part 2: Decentralisation and Economic Performance, AER 2009.

positive and statistically significant (see row Total): The higher the decentralisation, the higher the GDP per capita.

Table 1: Estimated coefficients of the decentralisation variable[6]

Dependent variable: **GDP per capita** (average 2001 to 2006)	**Total**	**Quantitative Decentralisation**	**Qualitative Decentralisation**
country data set	0.24662 ***	0.18510 ***	0.24208 ***
regional data set	0.09459 ***	0.04927 **	0.10115 ***

*, **, *** respectively means statistical significance on the 10, 5, 1 percent error level. Source: BAK Basel Economics

The coefficients for Qualitative Decentralisation are higher than for Quantitative Decentralisation. This implies that competences (the power to do something) are at least as relevant for economic prosperity as mere quantities (of people and money). Thus there is more to decentralisation than just decentralising taxes.

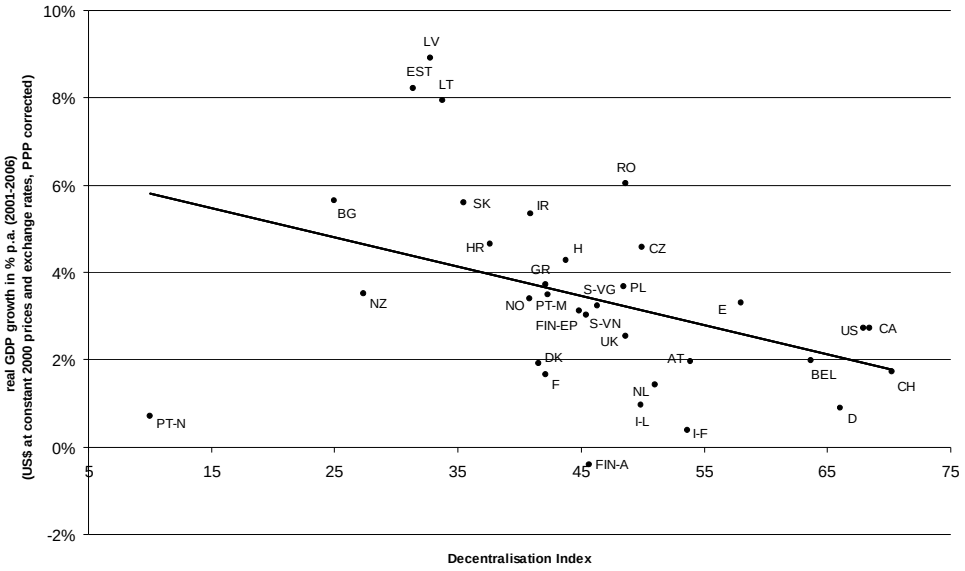
Using all elements of decentralisation as explanatory variables (see figure 1) shows that most of them have a positive impact on GDP per capita. With one exception all aggregates and sub-indices are highly significant. Many aspects of decision-making competences are significant; this stands in sharp contrast to the results of implementing competences which are not significant. This means that only the competences to make decisions are relevant for the economic prosperity of the regions but not the competence or duty to implement someone else's policy (the decisions made on the national tier). This seems to be particularly relevant in the fields of health care and of education and research.

The relevance of the financial variables must be put into perspective. They carry little significance in both data sets. This criterion is only met by the aggregate Financial Decentralisation (but not, e.g., for taxation competences). According to the regression results, the question of whether or not the regions have a strong impact on the legislative process on the national tier (national parliament) does matter,

[6] In addition to the Decentralisation Index the country set also includes regulation of product markets and high tech patents per capita. The regional data set also includes regulation of product markets, company taxation, publications per capita, Shanghai-Index points per capita, industry structure, and a dummy for capital city. The signs are as expected, the R squared are between 0.51 and 0.76.

whether there is a regional constitution (albeit an indication of the political culture rather than concrete power) or how independent the regional governments are from national authorities. Qualitative aspects seem to play as important a role as purely financial aspects.

Figure 4: Decentralisation and GDP growth



GDP growth and Decentralisation are negatively correlated (Figure 4): A higher Decentralisation Index corresponds with a decrease of GDP growth. This result has to be put in the relevant context: Some of the countries in the group of the Eastern European countries with a high degree of centralisation like Latvia, Lithuania, Estonia or Romania have extraordinary high economic growth rates which are typical for transition economies changing from a centrally planned to a free market economy. At the same time, the regions in these countries have almost no autonomy (yet). Nevertheless, they seem to catch-up quickly economically but are lagging behind in terms of decentralisation and an optimal organisation of government which would better suit economic development. The econometric analysis can control for history, transition and other location factors when estimating the impact of decentralisation on economic growth. The most important variable to this end is the level of GDP per capita at the beginning of the measured growth period allowing weaker regions to catch up and consequently stronger regions to grow below average.

Table 2: Estimated coefficients of the decentralisation variable[7]

Dependent variable: **GDP growth** (average growth rate 2001 to 2006)	**Total**	**Quantitative Decentralisation**	**Qualitative Decentralisation**
country data set	0.00196 **	0.00122 **	0.00283 **
regional data set	0.00182 ***	0.00102 ***	0.00272 ***

*, **, *** respectively means statistical significance on the 10, 5, 1 percent error level. Source: BAK Basel Economics

Table 2 shows the regression results when using GDP growth as endogenous variable. Again in both the country and the regional data set, the Decentralisation Index is clearly positive and statistically significant (see row Total): The higher the decentralisation, the higher the GDP growth. And again, qualitative decentralisation is more important than quantitative decentralisation.

A detailed analysis using all elements of decentralisation as explanatory variables shows that many of them have a positive impact on GDP growth. Deciding Decentralisation has about the same positive (and statistically significant) impact on growth as Financial Decentralisation. Decision-making power is much more relevant than implementation power. This seems to be particularly relevant in the policy fields of infrastructure and of recreation and culture. In the regional data set the financial variables are very strong. Unlike in the preceding findings, financial matters seem to be of utmost relevance for the economic growth of regions in Western Europe.

3. What is the impact of decentralisation on innovation?

As innovation is a crucial driver of economic growth, the role of decentralisation for various innovation indicators was also examined: (1) the patent density (number of

[7] In addition to the Decentralisation Index the country set also includes regulation of product markets, Shanghai-Index points per capita, share of tertiary-educated individuals, and GDP per capita in 2001. The regional data set also includes company taxation, manpower taxation, Shanghai-Index points per capita, change in industry structure, GDP per capita in 2001. Moreover, there is in both equations a quadratic decentralisation term to test for an inner maximum (coef < 0). However, the statistical power of the tests is not strong enough for a meaningful computation of an optimal value of decentralisation. The signs are as expected, the R squared are between 0.16 and 0.77.

patents per capita), (2) the Shanghai score density (number of score points in the university quality ranking of the University of Shanghai, per capita), (3) the publication density (the number of academic publications in reviewed scientific journals per capita).

Looking at the transmission channels, it is again effectiveness which speaks for decentralised solutions. As industry structure varies from region to region, education and research should be appropriate to the respective structure. The needs of an urban service based region differ from those of a heavy industry or pharmaceutical based region.

Given heterogeneous structures in space, regional policy can be specifically targeted to the needs of the prevailing sectors of the region. Regional authorities are better able to create an optimal balance of private and public institutions. Thus, regional specialisation makes it easier to reach the critical mass of Research and Development activities in the fields relevant to the region, thereby reinforcing existing strengths and creating a positive outcome.

However, there is also a case for a concentration in education and research (for example one huge research university per country): high positive externalities and substantial economies of scale (high fixed costs) are clearly in favour of centralised systems.

Table 3 shows the results for the three innovation variables. Decentralisation has a statistically significant positive impact on the number of **patents**. Regions in decentralised countries seem to be better suited to facilitate and support regional research. Decentralisation favours applied or industry-related research and development. In order to profit from positive spillovers, a minimum number of people (and institutes and/or companies) interested in specific issues (themes, technologies etc) is necessary. This cluster effect leads to specialisation (banking at one place, biotechnology or automotives in another). Although patents are not a meaningful indicator for all industries, the findings clearly indicate that decentralisation has a positive effect on directly usable research output (industry related or applied research and development) for which the number of patents is a good indicator.

Table 3: Estimated coefficients of the decentralisation variable[8]

Innovation	Total	Quantitative Decentralisation	Qualitative Decentralisation
Patent density	0.00111 ***	0.00086 ***	0.00084 ***
Shanghai score density	0.00012 *	0.00006	0.00013 **
Publication density	-0.01464 ***	-0.01116 **	-0.01125***

*, **, *** respectively means statistical significance on the 10, 5, 1 percent error level. Source: BAK Basel Economics

The results for academic **publications** are, on the other hand, very different to those of patents. The concentration effect (due to economies of scale) dominates the specialisation effect and also possible effects from diminishing marginal returns from research activities. This interpretation is supported by the negative sign of the decentralisation variable: As centralised states tend to centralise (i.e. concentrate in a few regions) their research budget, decentralisation leads to less efficient production of scientific articles. Moreover, publications are public goods and produce substantial spatial spillovers favouring centralised solutions. Thus centrally governed countries tend to have regions specialising in academic research (mostly the capital cities, in some countries strong university cities) and producing a large number of academic publications.

As to the quality of **universities** (measured by the Shanghai Index), the empirical results lie somewhere between those for patents and publications. There is a "trade off" between academic research on the one hand and education and industry-related research on the other. The effect of decentralisation is much lower for good universities than for patents. The sign is still positive but less significant, indicating that the concentration effect due to economies of scale becomes more important but is still less relevant than the specialisation effect. Moreover, the impact of quantitative decentralisation is much higher than that of qualitative decentralisation. This result is hardly surprising as good universities are very costly.

[8] In addition to the Decentralisation Index the regressions also include company taxation, continental accessibility, industry structure, and GDP per capita (average 2001-2006). The signs are as expected, the R squared are between 0.43 and 0.57.

The detailed analysis using all elements of decentralisation as explanatory variables shows that most parameters are positively significant in the patent equation (as is the case for the implementation of most policy fields), most parameters are positive but only few of them significant in the Shanghai equation and most parameters are negatively significant in the publications equation. A noteworthy aspect is the high relevance of most financial decentralisation indicators in the patent equation (positive) and in the publication equation (negative). The number of patents (publications) rises with increasing (decreasing) financial decentralisation, stressing the importance of financial means for research and education.

4. What conclusions can be drawn from the study?

The empirical analysis shows that decentralisation does have a significantly positive impact on the economic performance of countries and regions: in most aspects a higher level of decentralisation *is* linked to stronger economic growth.

For innovation capacity, decentralisation favours applied or industry-related research and development (measured by the number of patents) and, to a lesser extent, the quality of universities (measured by the Shanghai Index). Academic or basic research (measured by the number of scientific publications), on the other hand, tends to profit from a more centralised system.

These findings clearly suggest that the application of the **subsidiarity principle** is a key to economic success**.** This holds true in the short term (direct effect on GDP) as well as in the long term (via education and research).

Taking into account the specificity of the countries and regions examined in the study, the findings suggest that a country's economic performance can be improved with:

- more influence of the regions on the national level
- more independence of the regions from the national level
- more financial competences and resources for the regions
- more competences in (1) recreation and culture, (2) infrastructure, (3) education and research, and (4) health care.

The findings therefore suggest that national governments should concentrate only on providing services in areas:

- with high spatial externalities, or
- with substantial economies of scale,

while setting general policy in the other areas and supervising compliance.

Thus all other competences, both decision-making (legislative power) and implementation (executive power), should rest with sub-national authorities.

Finding the right “decentralisation balance” for any given country is not the aim of this study. But in providing countries and regions with data and empirical analysis that can be used as a basis for optimising economic growth, the study offers a valuable insight into how the application of the subsidiarity principle can indeed translate into economic success. As decision-makers are being forced to re-think their economic development strategies in the face of the current global economic downturn, our findings could not have come at a more auspicious time.