

University reform. A boost for the competitiveness of the Spanish economy

Policy Brief No. 4

June 2013

ISSN 2014-7457

1. Introduction

The crisis in the eurozone has revealed the inadequacies of its design. In previous *Policy Briefs*, we have indicated how the eurozone must develop fiscal and banking union as essential elements for progressing toward greater political union and thus making the European project as a whole sustainable. We also highlighted those specific aspects of the Spanish economy that hinder its integration into the European economy. Beyond the debate on austerity and growth, and the more pressing need to promote demand side policies, there is also a more general agreement on the need for such measures to be accompanied by structural reforms that, though they may have no immediate effects on the Spanish economy, are essential to ensure the competitiveness of our economy. The supervision exercised by the European Commission on the content and progress of the National Reform Program serves to validate the importance of such measures. In response to these demands, the Spanish government has been updating the contents of the National Reform Program, and the document presented at the end of April this year fulfilled the condition for allowing the deficit targets of the Spanish economy to be relaxed. This program notes that one of the measures to be developed will be the reform of the university legislation to promote excellence, competitiveness and internationalization of the university system, announcing the commitment to start legislating on such a reform in the second quarter of 2014. *EuropeG* shares the view that the reform of the Spanish university system is one of the pillars on which a more competitive economy should be built.

Spanish universities today provide graduate and post-graduate studies to one and a half million students and the new master studies to more than 113,000. In the

past academic year, close to 222,000 students graduated, with almost 50,000 obtaining a masters degree; this was achieved with 115,000 teaching staff and approximately 60,000 employees carrying out administration and services functions. Moreover, universities account for almost 29% of the Spanish economy's R&D spending and nearly 48% of Spanish researchers. They are also responsible for close to 17% of Spanish patent applications and 69% of the country's scientific publications. Together these constitute extremely powerful reasons for putting the university at the forefront of the Spanish government reform program. To this end, *EuropeG* has prepared this *Policy Brief* in which we justify the importance of the university in the new competitiveness model, of fundamental importance for the Spanish economy, and propose, with this goal, the lines along which the Spanish university model should be reformed.

2. From expansion to crisis in the Spanish economy. The role of the university

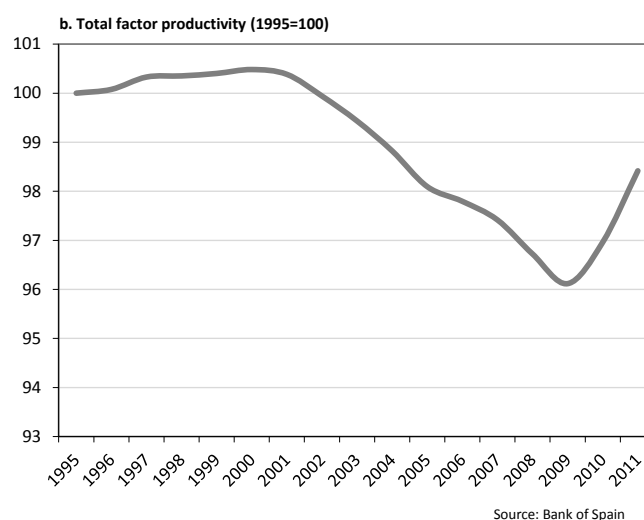
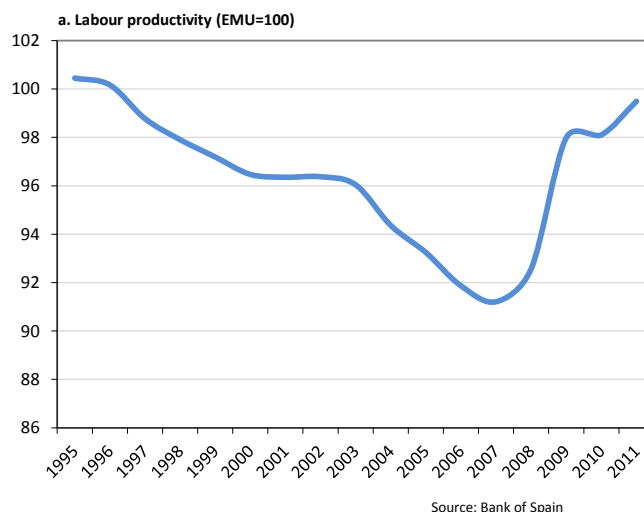
Variations in the production of goods and services in an economy can be broken down into the contribution of labour productivity (output per worker, or more commonly, output per hour worked) and the number of workers employed (or hours worked). In the long term, productivity is the key factor for economic growth because it is the only one that can grow in the long term without limitations. Productivity, in turn, has three sources: the increase in the stock of physical capital per worker; the increase in the skills of the labour force, i.e. the improvement of human capital, understood as the workers' body of knowledge and skills, obtained through training, experience, and apprenticeship; and

total factor productivity (TFP), or technical progress, which measures the improvement in the efficiency in the combined use of productive inputs in the production process. The university, in carrying out its three missions, i.e. the education of university graduates, the research conducted and the transfer of technology and knowledge to the productive system, plays an important role in the productivity of labour and in technical progress.

During the 1995-2007 period of economic growth, the contribution of labour productivity to the Spanish economic growth was certainly small, with average annual growth rates of around 0.5%, well below the increase seen in other advanced European economies. This caused Spain's position with respect to the Economic and Monetary Union as a whole to suffer a significant decline, starting from levels above the EMU average (Graph 1a). The positive contribution of productivity in this phase, on the other hand, was entirely due to the good performance of the capitalization of the economy (ratio of physical capital/worker) and the increase in human capital. In the first aspect, the accumulation of capital in assets linked to the construction sector had an especially important role (Fundación BBVA and IVIE, 2011). The fact that the contribution of the apparent productivity of labour was so small, however, is entirely attributable to the very negative trend in TFP (it decreased by an average of 0.8% per annum, compared with an increase of 0.4% in the EU), which served to aggravate the relative position of the Spanish economy's TFP compared with the rest of Europe. Graph 1b shows that positive annual variations occurred only between 1995 and 2000, although they were notably weak, with TFP falling since then throughout the rest of the 1995-2007 growth cycle.

This poor performance of apparent labour productivity in comparison with other countries, and the negative trend in TFP in the last decade, are not due, or at least, not entirely, to the leading role of construction in the recent expansionary phase of the Spanish economy, even though this sector is characterized by low productivity, relatively poorly efficient and the very intensive use of unskilled labour. The productivity and TFP indicators of all sectors, including industry and the most innovative and dynamic activities, have performed worse in Spain than in other advanced European countries.

Graph 1. Labour productivity and TFP in Spain



During the current crisis (2007-2011), productivity has begun to recover, growing by 2.1% per year on average, faster than the EMU, allowing Spain to converge again with the level of the eurozone, as can be seen in Graph 1a. While the positive contribution of the capital accumulation factor has been tempered –as has happened, though to a lesser extent, with the growth of the level of human capital– total factor productivity has again shown positive growth rates since 2009 (Graph 1b), which contrasts strongly with the negative trend seen year after year during the 2000s.

However, the recovery in TFP and productivity are related essentially to the restructuring and adjustment of the Spanish economy during the crisis period, which is causing a reduction in activity and, to a much greater extent, employment in low productivity sectors –an

obvious example would be construction–, less efficient companies and activities less intensive in knowledge.

Changes in total factor productivity probably reflect the effects of a wide range of explanatory variables. In some of these, the university can exercise only minimal influence. This would be the case, for example, of company size: the larger the company, the more productive and efficient it will be; thus the average size of Spanish companies, significantly smaller than in other advanced European countries and the OECD as a whole, is a factor explaining, in part, the worse performance of TFP and Spanish productivity in the growth phase. Another example would be the relatively poor functioning of markets for products and productive inputs in Spain compared with other countries, which hinders the efficient allocation of these inputs to the production process, because of the greater rigidities and a relative absence of liberalization and flexibility. Thus, in Spain companies face higher regulatory and administrative costs; the labour market still suffers from rigidities, despite the reforms and the high proportion of temporary employees is a particularly negative factor; temporary workers came to represent almost 35% of the total in the last economic expansion and the ratio currently stands at around 25%. Despite the reduction, this percentage is almost double the European Union average. The high incidence of temporary employment is harmful to productivity, because the excessive rotation in jobs does not motivate workers to acquire specific employment-related training, which would affect their performance, nor does it motivate companies to spend resources on training these workers.

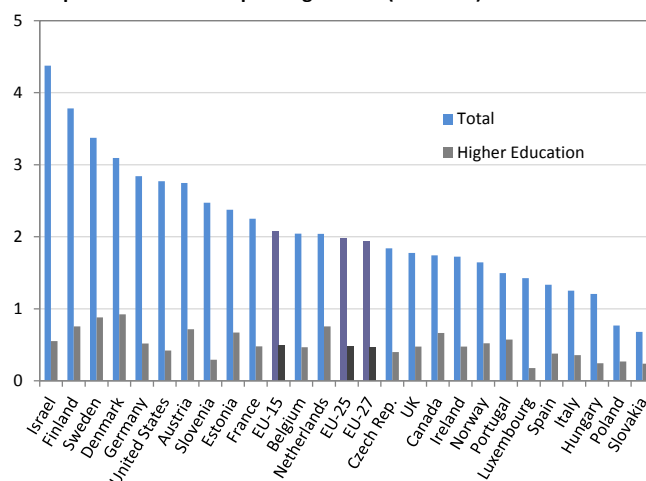
However, the role of the university is clearly more relevant with regard to other variables affecting the behaviour of TFP and the apparent productivity of labour.

University, TFP and capacity for innovation

One of these variables is an economy's capacity for innovation, for which the ratio of spending on innovation and development to GDP represents an approximation (see Graph 2). The Spanish indicator, at 1.3% in 2011, shows a significant increase compared with the beginning of the decade, with 0.95% in 2001, and it is very similar to that of Italy and Portugal. But it

is far behind those of the leading OECD countries, such as the Nordic countries –Finland and Sweden– where the corresponding indicator is above 3%, and is also less than the figure for Germany, close to 3% or France, above 2%. Viewed from another perspective, according to Bank of Spain indicators, the ratio of the stock of technological capital to GDP (calculated as accumulated R&D spending according to the permanent inventory method) barely exceeded 60% of the Economic and Monetary Union average in 2010 (compared to 42% in 1995).

Graph 2. Internal R&D spending in 2011 (% of GDP)



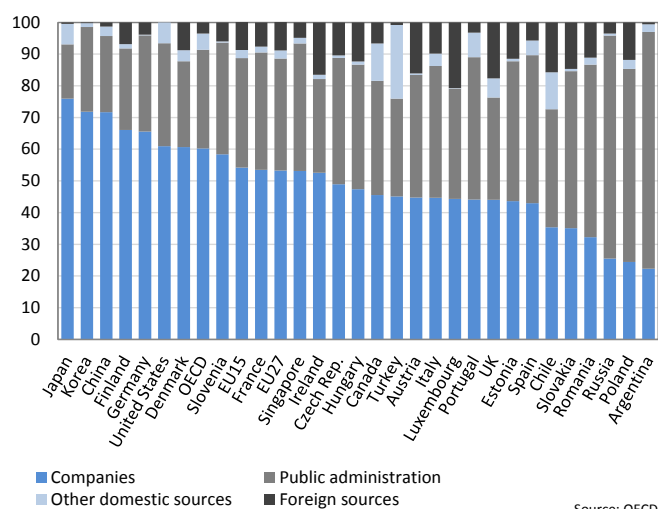
Source: OECD

Spanish universities have played a significant role in this indicator, and have been more influential than in other advanced countries (Graph 3). In contrast, the role of business has been relatively small. Thus, the business sector only accounts for slightly more than 50% of R&D spending in Spain, while the corresponding figure for the OECD as a whole is close to 70% and somewhat more than 60% for the European Union (over 70% for the countries which are leaders in R&D).

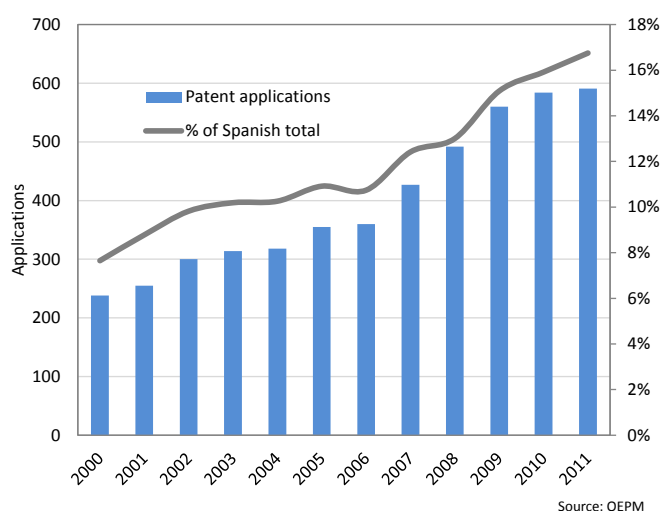
The remarkable increase in the allocation of resources to R&D has not been translated into a comparably greater transfer of that knowledge. Thus, for example, despite almost continuous growth in patent applications since 2000 (Graph 4), the Spanish share of EU patents is less than 2%, compared with its share of GDP or population, which is closer to 10%. However, the role of universities in the total number of patent applications has been growing, from 7.7% in 2000 to

17% in 2011. Nevertheless, where the Spanish university has been most prominent is in the production of scientific papers, which has maintained a steady growth in recent years, reaching tenth position in the world in the number of publications (Graph 5).

Graph 3. Who finances R&D?



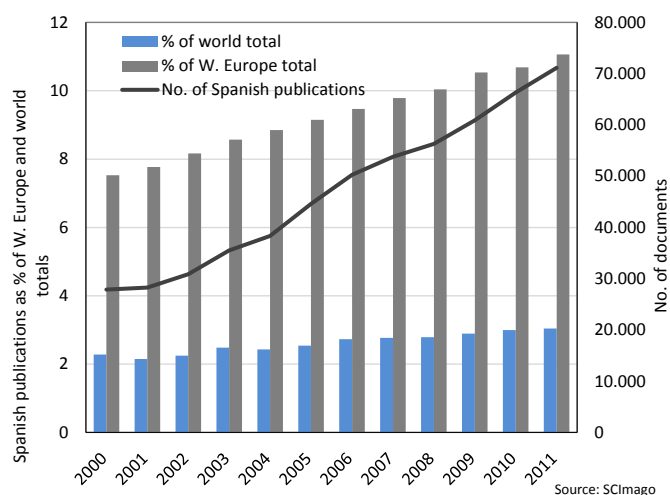
Graph 4. National patent applications by universities (2000-2011)



On the one hand, these results are evidence that universities have achieved a remarkable performance in scientific publications, an important indicator of R&D results, which reflects both the greater availability of resources and the emergence of a new type of research centre with greater autonomy in its funding and staffing policies, together with a system of incentives established for faculty, the six-year research periods. On the other hand, however, this is not so in

technology transfer activities such as the above mentioned patents, or the creation of spin-off enterprises.

Graph 5. Spanish scientific production in Scopus (2000-2011)



University, TFP and human capital

The university's role with regard to the effective use of human capital is also significant. In this regard, the educational improvements achieved among the population in Spain, especially in the period of economic expansion 1995-2007, led to only a limited progress in productivity, which is attributable to deficiencies in the use of human capital. Apart from the problems caused by inefficiencies in the labour market, which prevented the achievement of all the productive potential of human capital, as outlined above, there are the problems of over-qualification and the quality of human capital, which are related to the functioning of the universities.

With regard to quality, it should be noted that human capital is usually measured using proxy indicators that are far from perfect or complete, such as the average number of years spent in education or the percentage of graduates or similar, quantitative variables that exclude considerations of the quality of that education. If the education system were inefficient and of low quality, the increase in human capital that is being measured, would not be so high in practice (in this case, therefore, there would be a negative contribution to TFP). The data available on Spain in the PISA program (Program for International Student Assessment) raises

doubts about the quality of Spanish education, in comparative terms, as in all the areas of knowledge evaluated –science, reading and maths– Spanish students obtained scores below the average for OECD countries and the European Union. Nevertheless, compared to the results for the previous year for which data are available (2006), there has been an improvement. There are no indicators similar to those of PISA at the university level, so that it is not possible to establish an international comparison in terms of the quality of human capital of the university students.

Over-qualification or over-education, i.e. when highly trained workers end up employed in positions requiring a low level of qualification, is another factor that prevents the effective use of human capital, i.e. that prevents the increase in Spaniards' level of training from having the maximum positive impact on the apparent productivity of labour.

Table 1. High-level jobs and university graduates aged 25 to 64

% highly skilled occupations	2000	2007	2012
EU27	34,4	37,9	39,8
EU15	36,2	39,5	41,6
Germany	38,9	41,1	43,5
Spain	29,0	31,7	32,5
France	35,5	39,7	44,8
Italy	31,1	40,2	34,5
UK	40,1	41,9	47,2
Graduates as % of adult population	2000	2007	2012
EU27	18,9	23,4	27,6
EU15	20,4	25,0	29,1
Germany	22,5	24,3	28,1
Spain	22,5	29,0	32,3
France	21,6	26,6	30,8
Italy	9,4	13,6	15,7
UK	24,4	30,6	38,2

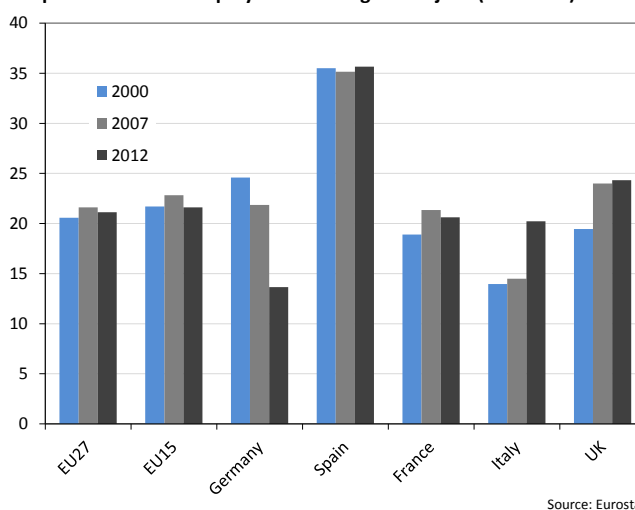
Source: Eurostat

In this respect, the statistical data available show that, in comparison with the European Union, Spain produces more university graduates for high-level positions than its productive structure is able to employ: hence that Spain has more relative over-education (Table 1). Indeed, in 2012, less than a third of those employed in Spain were in high-level positions (i.e. directors and managers, scientific and intellectual technicians and professionals, and technical and professional support staff); of all the European Union countries, only Romania, Bulgaria, Greece and Portugal had a lower percentage. While at the end of 2012 almost one out of three people between the ages of 25

and 64 had a higher education diploma in Spain, this percentage was higher than in the EU as a whole; in fact, among the 27 countries of the European Union, Spain was in twelfth position.

On the other hand, in 2012 (Graph 6) less than two thirds of Spanish graduates in employment were in high-level occupations, the lowest ratio of all the countries of the EU.

Graph 6. Graduates employed in non-high-level jobs (% of total)



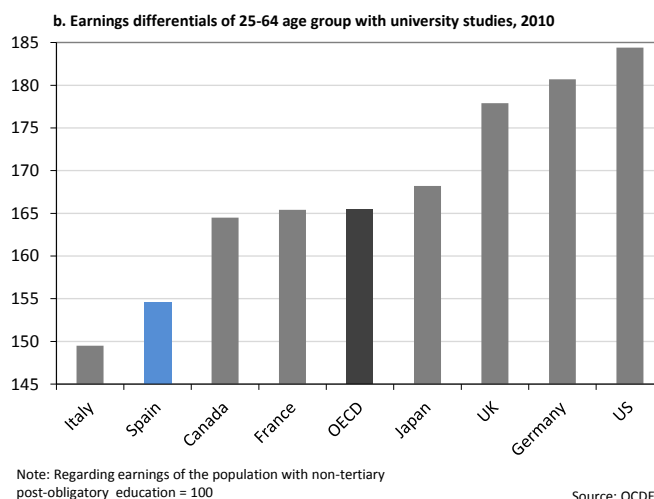
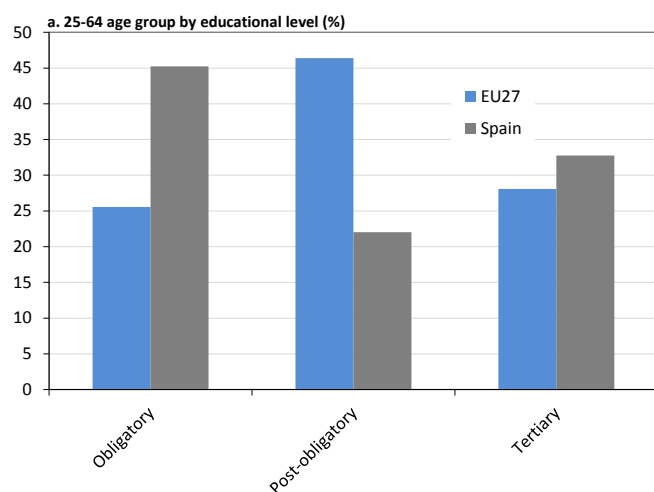
With regard to the proportion of adults who only have at most completed compulsory education, Spain occupies outlying positions among the EU-27 with 45%; this is very considerably above (almost double) the European Union average. Moreover, those who have further but non-tertiary studies (i.e. Baccalaureate, middle-level technical training and similar) account for 22%, less than half the EU average (Graph 7a). Only Portugal and Malta show more extreme values.

Another way to view over-qualification is through wage differentials, which are lower in Spain than in most of the major advanced OECD countries (Graph 7b).

As noted by Fundación BBVA and IVIE (2012a), to improve the match would require not only a change in the productive specialization of the economy, but also a restructuring of the education offered, reducing the proportion of subjects facing greatest problems in the labour market. In this regard, it is worth noting the mismatches existing today between supply and demand for places on various degree courses. Moreover, these mismatches persist from year to year due to the rigidity

and lack of flexibility of the universities in adjusting resources and staffing to the new circumstances. In general, the courses in health sciences, especially medicine, have experienced a permanent excess demand, while many degrees in arts, humanities and sciences have had excess supply (Fundación BBVA and IVIE, 2012a).

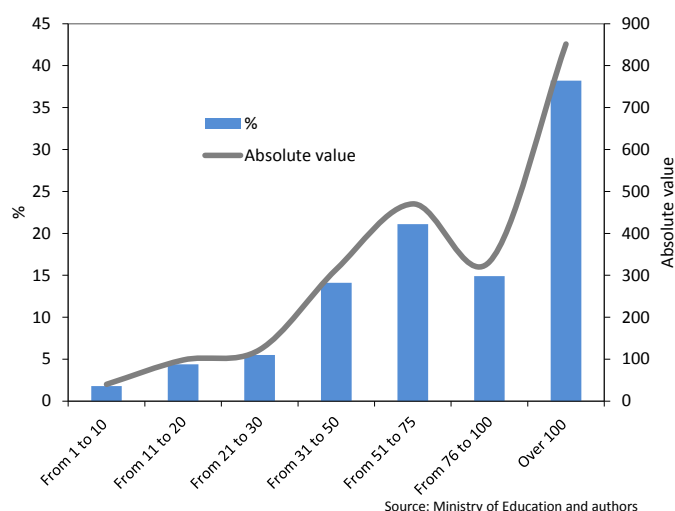
Graph 7. Population by educational level and relative earnings of the population with university degrees



Partly due to these mismatches, a quarter of the degree courses in Spanish public universities in the 2011-2012 academic year had 50 or fewer new students; the percentage reached 39% in the case of arts and humanities (more than 20% with less than 31 students, in fact) and 36% in science, engineering and architecture (Graph 8). Moreover, this is combined with the fact that in many cases multiple similar courses are provided within a short distance of each other. Thus,

beyond the debate as to whether the Spanish university system has too many universities, the debate should centre on how to rearrange the range of courses provided.

Graph 8. Degree courses by number of new students, 2011-12 academic year



In contrast to university studies in humanities, especially social sciences and experimental sciences, those which offer the best employment opportunities are health sciences and technical degrees: the best match between the training received and the work performed, more stable employment, higher remuneration and more job satisfaction. Such information on employability in the various areas of education –and even specific courses– should be available to families and future students.

Also, to make better use of human capital, it would be desirable for educational institutions to forge closer relations with the economic and social system when they are configuring programs and designing activities because, when recent graduates have a job, they often discover mismatches between their knowledge, especially their practical knowledge and competencies, and what the company needs and demands.

Mora (2011) indicates, in this respect, that to overcome the shortcomings in graduates' competencies, it is necessary to change the educational model of teaching and learning. In his work, he comes to the conclusion that the typical teaching methods traditionally used in the university, such as the professor as a source of

information, the multiple-choice and written exams as a method of evaluation, as well as the emphasis on theories, concepts and paradigms, produce little or no increase in the competencies needed to face the labour market. On the other hand, there are other methodologies which are more effective in increasing the majority of competencies such as problem solving, involving students in research projects, developing practical and methodological knowledge, and oral presentations. However, changing the teaching and learning method would require the cooperation of a teaching staff which is evaluated and promoted during their professional career on the basis of the research they conduct, and not of the quality and usefulness of the teaching that they deliver.

University graduates extract the full potential of their human capital according to the work experience they accumulate, necessary to value that capital, and also the on-going training they receive. To achieve significant impacts on productivity it is essential that, once graduated from university, workers undergo continuing education throughout their professional lives, which should serve to prevent the obsolescence of their university knowledge and skills, and to acquire training complementary to their university studies, thus adapting themselves better to the requirements of each job that they may have.

In this respect, graduates are usually more likely to undertake permanent training activities than the population as a whole. Thus, for example, according to Eurostat's 2011 *Adult Education Survey*, 37.7% of the Spanish population aged 25 to 64 followed some kind of learning activity at some point in the year, a percentage that rose to 57.7% in the case of graduates. However, formal educational institutions such as universities played only a minor role as providers of this permanent education, although they were more important for graduates than the overall population. Hence, according to the survey, the percentage of permanent training activities received by graduates from this source did not exceed 15% of their total. The institutions –commercial or otherwise– whose main activity is not education, such as suppliers of equipment and services, professional associations, public agencies, etc., were some of the most popular sources, while non-formal education and training institutions, such as private academies, and employers, acting on their own initiative, have practically the same importance as

formal institutions as providers. In this respect, if universities want to be more involved in this type of lifelong learning, they should make their programs, itineraries and teaching methods more flexible and make a more intensive use of new technologies.

3. Research performance and university autonomy. Some evidence

The need to find consistent explanations for the lower growth in the European economy compared to the US in the last few decades has given rise to numerous studies, a number of which attribute its weaker competitive position to the capacity for innovation and the state of higher education in Europe (Aghion et al. 2007, 2008 and 2009).

Moreover, other studies (Vandenbussche et al., 2007) have pointed out that productivity growth can be both a consequence of imitating more developed technologies or, alternatively, innovating at the technological frontier. Moreover, it is argued that while an increased investment in primary and secondary education translates into a greater capacity to incorporate existing technologies into productive processes, investment in higher education translates into a greater ability to promote innovation on the way to the technological frontier.

From the foregoing, it can be concluded that it is as important to invest in education as a whole as it is to discriminate between the different levels of education and, also, that the closer an economy is to the technological frontier, the greater the impact of investment in higher education on the economy.

In any case, if we take on board these results and emphasize their importance for the European economy as a whole, there is no reason not to extend it to economies as Spain.

Some recent works have shown where the universities with highest research performances are located and identified some of the variables which determine them.

These works determine research performance through the results of the so-called Shanghai ranking. This ranking, one of the best known, classifies universities in terms of the following indicators:

- a) The number of alumni who have obtained the Nobel Prize in physics, chemistry, medicine and economics or the Field Medal in mathematics;
- b) The number of professors at the university who have achieved any of the above awards;
- c) The number of articles that professors at the University have published in the journals *Nature* and *Science*;
- d) The number of articles published by the professors of the university that appear in the *Science Citation Index*;
- e) The number of professors that are the most cited in the above publications;
- f) Academic performance, defined by the above indicators in relation to the size of the university according to their number of full-time faculty members.

These six variables make up the final synthetic index as follows. The absolute bibliometric indicators together account for 60% of the final index: 20% for the number of articles published in *Nature* and *Science*, another 20% for the publications in the SCI, and 20% for the number of teachers most frequently cited. The three remaining variables represent 40% of the final synthetic index: 10% for students who have obtained the Nobel Prize or the Field Medal, 20% for professors who have obtained the same awards and the remaining 10% for the total of the above indicators per number of full-time faculty members.

Table 2. Research performance index by country (United States=100)

	top 50	top 100	top 200	top 500
Germany	0,0	15,5	37,9	74,5
Austria	0,0	0,0	9,5	83,1
Belgium	0,0	10,7	82,0	125,2
Denmark	0,0	24,8	78,9	120,8
Spain	0,0	0,0	0,0	23,0
Finland	0,0	48,6	73,9	104,3
France	11,3	22,6	37,5	53,0
Greece	0,0	0,0	0,0	18,1
Netherlands	0,0	43,5	127,6	159,8
Ireland	0,0	0,0	0,0	82,1
Italy	0,0	0,0	10,5	39,3
Portugal	0,0	0,0	0,0	16,2
UK	80,7	83,7	97,0	120,0
Sweden	29,4	109,6	168,4	223,2
EU-15	15,2	25,7	44,6	73,4
Australia	0,0	45,2	108,1	145,9
Canada	33,2	51,5	68,3	111,2
China	0,0	0,0	0,5	3,3
South Korea	0,0	0,0	4,8	23,6
US	100,0	100,0	100,0	100,0
Japan	14,4	13,9	21,2	26,0
Norway	0,0	67,5	84,8	134,9
Switzerland	143,2	277,9	325,2	269,6

Source: europG using methodology developed by Aghion et al. (2007).

Thus defined, the Shanghai index, as an indicator of universities' performance, emphasizes the importance of bibliometric indicators to measure the research capacity which, on the one hand, penalizes those disciplines which make less use of scientific publications as the output of their research activity, and, on the other hand, reduces the analysis of university performance to the researcher, as it does not incorporate measures of performance with regard to teaching activities and knowledge transfer.

Moreover, when university results are grouped by countries, they underestimate the research performance of those which have important research centres outside the university.

With these considerations, the development of a performance index by country, based on universities' positions according to the Shanghai index, shows that, in the first place, American universities are pre-eminent in relation to European institutions in any of the thresholds defined in that ranking. Secondly, this superiority is much more marked in the groups of the first 50 or 100 universities than in those of the first 200 or 500, so that the variance among European universities in terms of research performance is smaller than among American universities. Thirdly, the positions in research performance are not affected by the public or private nature of the universities or by differences in public pricing policies. Countries with high tuition fees and a high proportion of private universities –such as the UK or the USA– achieve relatively good results in terms of research performance, as do others –for example Sweden or Switzerland– with low tuition fees and public university systems. Fourthly, when the results obtained from the 2006 Shanghai ranking (Aghion et al., 2007) are compared with those for 2012, there has been relative stability in the position of the European universities (EU15) in relation to the Americans in all the groups considered. France is the European country that has achieved the biggest improvement in its position in the top 50, but this may be due to changes made in the institutional map of French universities in the intervening years. Switzerland is the only European country to achieve a performance index more than 40% better than that obtained by the US in the top 50 universities. Finally, it should be noted that, over the 2006-2012 period, the Spanish universities have improved very slightly on the relatively modest results

achieved in 2006. Spanish universities are still absent from the top two hundred and it is in the group between the first 200 and five hundred where the calculated performance index has improved from 14 to 23, where 100 represents the index of the US universities.

What are the main causes of universities' research performance?

A number of works, notably Aghion et al. (2009), have identified a series of elements that are present in the university systems with the best research performances. These elements allow us to contrast the very different situations in European and American universities. The results obtained from a survey of nearly 200 European universities that form part of the top 500 identified in the Shanghai ranking allow us to affirm that there is a close and positive relationship between the level of university expenditure per student and the research performance of the university.

If the resources available are an essential element to explain a university's research performance, so is its level of independence. The works cited show that the universities with greater management autonomy obtained better results than those with lower levels of autonomy.

Management autonomy is understood as the university's capacity to develop its academic offerings, to select its students and professors, to establish a policy of attracting faculty which aims at a low rate of endogamy, to set academics' salaries and working conditions in general, and to approve its budget and manage its assets. Greater autonomy is also understood to mean that a higher percentage of revenue is derived from sources other than public funding and from competitive resources for research.

The results obtained from the works mentioned indicate the relationship that exists between European universities' position in the Shanghai ranking and an autonomy index that standardizes the features mentioned. Thus, British universities can be seen to achieve a better position in the Shanghai ranking and have higher rates of autonomy; the same is true of Swedish universities. In contrast, the Spanish universities studied combine lower positions in the ranking and with lower rates of autonomy. A similar

relationship has also been found among American universities.

Additional results also allow us to affirm that a greater level of autonomy for universities and, in consequence, greater competition among them, produces better results in research performance –measured in terms of patents– given the same level of university expenditure. Thus, while the results suggest that research performance is associated with the level of university expenditure, they also seem to suggest that for a given level of university expenditure, the performance improves in line with the level of management autonomy and the competition between institutions.

Therefore, the introduction of measures that would increase the level of universities' autonomy and promote competition between them, along with an increase in university expenditure, should increase universities' research performance. The effectiveness of this increase, as has been pointed out, will be positively correlated with the competitiveness of the economy in terms of its degree of proximity to the technological frontier.

As has been mentioned, this analysis has the limitation of reducing university performance to its ability to generate prominent scientific publications. A more detailed analysis would incorporate other performance indicators reflecting, for example, the universities' academic and knowledge transfer activities. However, appropriate information for this type of analysis at the international level is currently not available. In the near future, thanks to a European Commission initiative, it will be possible to extract information from U-Multirank, whose main features include the analysis of universities' activity from a multidimensional perspective. In any case, it is not unreasonable to consider research performance as a proxy variable for performance in other dimensions of the university, particularly knowledge transfer.

4. The impact of the economic expansion and the crisis on the Spanish university system

The close relationship between university expenditure levels and performance levels needs to be taken into account in defining the objectives for universities in

general and Spanish universities in particular. However, as noted above (and the works mentioned in the previous paragraph offer noteworthy evidence in this regard), as well as the amount of expenditure invested in universities, due weight must also be given to the characteristics of universities' organizational structure. In other words, the performance of the university system does not depend only on the resources invested but also on its level of autonomy, understood, as already mentioned, as that which allows universities a greater involvement in the management of their budgets and assets, in the selection of their students and the definition of their academic programs, in the recruitment of their staff, and the establishment of their working conditions and of the public prices of their academic provision. Moreover, the results obtained show that the more autonomous the university in the terms mentioned above, the higher the returns generated by each additional euro invested in the universities.

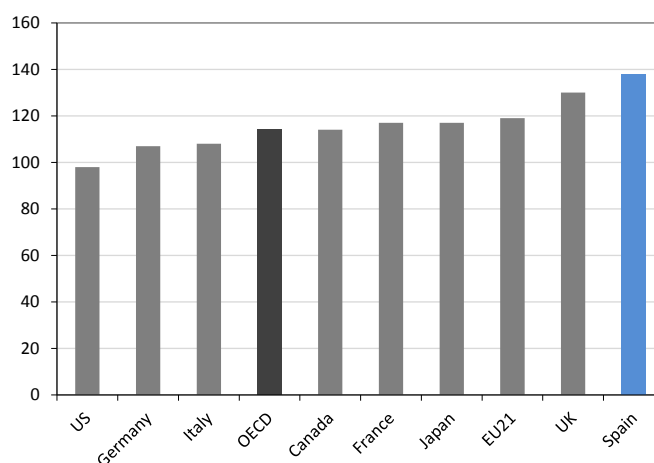
Economic expansion and mismatches in university activity

The most recent expansionary phase of the Spanish economy was accompanied by substantial growth in public budgets for universities, on the part of both the central administration –basically, resources to fund the research– and the autonomous regions, through their current and capital transfers to universities to fund their current activity and their investments. The combination of growth in higher education spending and the decline in the number of students has meant that, in the period 2000-2008, Spain's spending per pupil has grown more than that of the EU21 and more than in most major countries (Graph 9). This increase in resources was also accompanied by incentives (a relevant example would be the six-year research periods) which together account for the very significant increase in scientific publications, while patent applications were also growing and new initiatives such as the scientific and technological parks and international centres of excellence were introduced.

However, this increase in resources and motivation using incentives has not been accompanied by an increase in university autonomy. This has made it more difficult, on the one hand, to sustain the efforts developed over time and, on the other, to translate them into an effective transfer of knowledge to the

productive system and toward an improvement in productivity. Moreover, the lack of university autonomy and the design of university governance have meant that the efforts needed to address some of the negative side effects caused by the most recent expansionary phase of the Spanish economy have not been made.

Graph 9. Higher education spending per student in 2008
(2000 = 100)



Source: OCDE

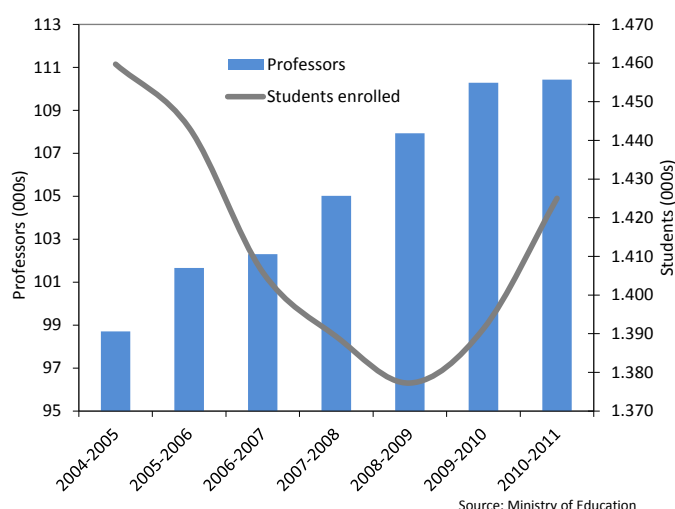
One of these negative side effects was the continuous decline in the number of university students up to the 2008-2009 academic year, in part because of the increased opportunity cost of studying during that period, which had such a positive impact in terms of job creation. This did not prevent an equally continuous increase in the number of teaching staff in the same period, which logically affected the efficiency of the system (Graph 10). During the same period, there was also a failure act to deal with a growing provision of courses, in no small number of cases with very few students and with a multiplicity of degrees with very similar content in small geographical areas.

As mentioned in the first section, other side effects of the growth pattern of the Spanish economy during these years were responsible for the fact that the results of the teaching activity itself, together with the indicators of graduate employment and knowledge transfer, fell below those obtained by other university systems in referral countries.

Presented in these terms, it would seem that the Spanish university system, with its organization and legislative framework, had no responsibility in the

results obtained, but nothing could be further from the truth. The Spanish university as we know it is the result, in great part, of the 1983 University Reform Law. Since then, there have been only relatively small legislative changes, focussed on designing successive procedures for joining the teaching profession in the public universities. Far, far different from what has happened in many European countries, precisely those with some of the leading university systems.

Graph 10. Degree students and teaching and research staff



Today the Spanish university faces major challenges with which, from our point of view, it cannot deal without substantial reforms to its organization and governance.

Universities are faced with demands not only to take a more prominent role in their traditional missions of education and research, but also increasingly to orient their activity more purposefully to the transfer of knowledge to society and, in general, to contribute to the economic and social development of their geographic area of influence, at the same time, moreover, transcending their national boundaries and taking on increasingly international profiles. Adapting university systems to the international mobility of students and professors, and providing information systems enabling similarly international comparisons of universities' performances, is an increasing concern for the universities and the public authorities responsible for them. The most obvious example of this concern is the development of the European Higher Education Area. In addition to all the above is the likely impact on

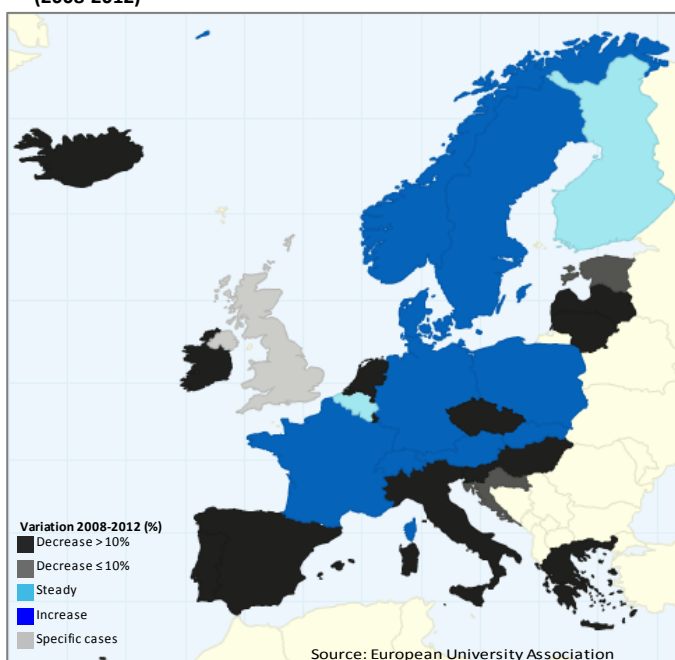
the universities themselves of the recent emergence of the MOOCs, Massive Open On-line Courses.

While this is the academic context in which universities in general, and Spanish universities in particular, have to design their strategic aims, the key issue today is the impact of fiscal consolidation on universities' budgets and this, without doubt, is rewriting the guidelines of the traditional funding model for universities in Spain.

Fiscal consolidation and university system

As noted above, during much of the first decade of the century, the growth in university expenditure per pupil in Spain has been very substantial. This growth has meant that public spending has reached almost 80% of the total, and that Spain also has relatively low tuition fees and a relatively low percentage of students who receive financial assistance, compared with other countries. This is the financial framework in which the impact of fiscal consolidation on public financing of the Spanish universities is being felt.

Map 1. Variation in public funding of higher education in Europe (2008-2012)



As shown on Map 1, prepared by the European Universities Association's Public Funding Observatory, this impact has been especially significant in the Spanish university system. Spain has seen public

funding for universities reduced by more than 10% in the 2008-2012 period, as have other countries which the EU has had to rescue or which have had serious budgetary problems (Portugal, Ireland, Greece, Italy, Latvia, Lithuania, Iceland, Hungary and the Czech Republic, to which we must add Holland). However, apart from the importance of these figures, which represent a radical change from the previous sustained growth trend in public university spending, the trends observed show quite different patterns of behaviour in Europe. On the one hand are the group of countries listed above and, on the other, another significant group of countries: the Nordic countries, France, Germany, Poland, Switzerland, Austria and Slovakia, where public university expenditure has continued to grow in the same period.

The successive budget cuts have been reflected, though not equally, in a decrease in available resources for universities' research and teaching, in the introduction of policies to streamline academic programs, in the remuneration policy for faculty and administrative staff and in the recruitment of new faculty. Another of the effects of the current economic situation has manifested itself in the policy of public prices. In general, there has been an increase in the private contribution to total university spending, which is justified by the public sector's increasing difficulties in maintaining the growth in its contributions and also because the estimated internal rates of return on public and private investment in higher education highlight its profitability in terms of opportunity cost with respect to alternative investments. These, then are the justifications put forward for these costs being increasingly borne by those who will benefit from university education. In this respect, the majority of European countries have increased the amounts of fees, through different mechanisms. Some, however, have done the opposite; the most remarkable in this regard is Germany, where all the Länder have eliminated tuition fees.

The Spanish university system clearly reflects these trends, due to the fact that universities' funding depends primarily on the budgets of the autonomous regions, and these have acted in different ways. Tables 3 and 4 show that, in the 2009-2011 period, public universities' non-financial income fell by 7.8% due to current transfers declining by 9.4% and capital transfers by 11.1%, while in contrast public prices increased by

0.6%. Some regions have suffered notable declines in non-financial revenues, such as Castile-La Mancha (down 17.3%), and, at the other extreme, others, such as the Basque Country, far from decreasing, have seen an increase of 9% in the period in question.

This reduction in revenue has forced universities to cut expenditure, though less than the fall in revenues, impacting spending on staff costs and real investment. In contrast, current expenditure has continued to rise in this period. As with revenues, the autonomous regions have diverged with regard to expenses, with the two regions mentioned above showing a similar behaviour, though other regions have not managed expenditure in line with the behaviour of revenues.

Table 3. Budget settlements for public universities, revenue (% variation 2009-11)

On-site public universities	Non-financial revenues	Sec. 3	Sec. 4	Sec. 7
Castile-La Mancha	-17,3	-10,2	-17,5	-25,5
Galicia	-13,7	-20,5	-9,6	-20,9
Valencia	-12,4	-0,8	-5,8	-48,4
Madrid	-12,3	-1,0	-8,6	-39,6
Catalonia	-10,2	11,9	-16,1	-20,7
Canary Is.	-9,8	-2,2	-4,3	-49,3
Balearic Is.	-9,2	-4,7	-8,1	-19,6
Cantabria	-8,5	-6,9	-6,4	-17,0
TOTAL	-7,8	0,6	-9,4	-11,1
Aragon	-7,2	8,2	-3,3	-25,3
Extremadura	-7,0	-7,5	-4,0	-18,5
Castile & Leon	-4,7	3,8	-0,5	-41,0
Andalusia	-2,5	-4,7	-19,1	83,5
Navarre	-1,5	-9,0	4,1	-96,4
Asturias	-1,3	6,3	-4,0	3,5
La Rioja	0,3	-4,8	4,1	-22,5
Murcia	2,5	1,5	16,5	-32,9
Basque Country	9,0	13,8	0,3	66,8

Sec. 3: Fees, public prices & other income

Sec. 4: Current transfers

Sec. 7: Capital transfers

Source: Fundación CYD

Moreover, in 2012, as public budgets continued to contract, for the first time there was a substantial increase in the prices of tuition fees to be paid for the first time for undergraduate degree courses; the increase of 15.9% in 2012-13 compares with 6.2% in 2010-11 and 4.5% in 2011-12. For masters courses, this increase has been much more significant, reaching 63.6% in the current academic year, compared to 1.6% in 2010-11 and 3.6% in 2011-12.

Table 4. Budget settlements for public universities, expenditure (% variation 2009-11)

On-site public universities	Non-financial expenditures	Sec. 1	Sec. 2	Sec. 6
Castile-La Mancha	-15,8	0,3	-24,8	-60,3
Galicia	-7,3	-1,8	-10,0	-23,1
Valencia	-6,9	0,1	2,9	-20,0
Madrid	-5,4	0,9	7,4	-24,8
Catalonia	-5,2	-3,9	0,3	-14,7
Canary Is.	-4,8	-0,2	-15,9	-12,7
Balearic Is.	-4,6	-6,2	0,2	-2,9
Cantabria	-4,3	-1,4	-6,0	-20,2
TOTAL	-3,9	-4,8	-0,7	9,9
Aragon	-2,8	-1,9	0,6	-7,1
Extremadura	-2,6	-5,2	3,9	0,8
Castile & Leon	-2,4	-3,5	0,7	-2,6
Andalusia	-1,5	-2,5	6,0	-2,6
Navarre	-1,5	0,5	-5,8	-0,3
Asturias	-1,2	-0,4	-0,4	-5,0
La Rioja	2,0	-0,9	7,2	2,9
Murcia	5,4	2,7	13,9	2,1
Basque Country	5,5	-0,9	-12,8	26,7

Sec. 1: Staff costs

Sec. 2: Current expenditure, goods & services

Sec. 6: Real investment

Source: Fundación CYD

Beyond the current situation, these developments raise a number of issues which must be discussed. What public resources are we prepared to invest in universities? What should be the private contribution to total university expenditure? How should the private contribution be implemented? How can equal access to university education be guaranteed?

The answers are not simple but it is imperative that they should be found. Spanish society cannot afford not to use an institution such as the university which, let us not forget, is the institution with the greatest educational and research potential that the country has, and one of the most important levers of change to boost the competitiveness of the Spanish economy and to contribute to the welfare of its citizens. Hence, it is essential to turn the current situation round as soon as possible, seeking the widest possible consensus to design a university funding policy that will provide the most stable scenario possible, so that the universities can carry on their activity in a more predictable financial environment.

5. Society and the university. A mutual commitment

As has been pointed out, if the university is to constitute a powerful lever for improving the competitiveness of the Spanish economy, it is necessary to continue increasing its research performance, improving its educational capacity, developing its capacity to transfer knowledge and, in general, enhancing its international presence. To achieve these goals requires society to increase the public and private resources at its disposal, especially if we want to see some of our universities occupy prominent positions in the global university system. It is not possible to achieve these results with the resources currently available to Spanish universities.

However, we should not forget that maximizing efficiency in the use of the resources allocated to the university is just as important as the amount thereof. To achieve this, the university must be provided with an adequate organization and a proper governance, enabling it to achieve its objectives, which are no more and no less than to contribute to the economic and social development of Spain. These should be the terms of the mutual commitment between society and university.

What should be the main lines of the reform of the Spanish university system?

To answer this question, it seems appropriate to highlight, firstly, what has occurred in those countries, mainly European, whose university systems could be a standard for the Spanish university system and, secondly, to identify the main characteristics of the reforms proposed by some of the commissions set up by the central government and a few regional governments for this purpose.

The governance structure of continental European university models has traditionally encouraged collective decision-making, promoting an implicit non-aggression pact between the different groups involved in the governance of the university. In these conditions, it is difficult for the rector, the deans or department heads to make decisions, especially important ones, involving a confrontation with the majority that has chosen all of these academics. When a decision is

unavoidable, the need to ensure those majorities has the effect that they are taken much more slowly than is desirable. Moreover, it should be added that the collective may dismiss the rector, and that the rector, who is selected from among the university's academics, returns to his teaching position at the same university once his mandate is over, creating additional obstacles to agreement on issues lacking sufficient consensus.

As has been pointed out (Garcia-Sicilia, 2009) "one of the most common criticisms of the traditional Spanish model of university governance is that it has generated a complex mechanism of corporatist representation – teachers, students and administration and services staff– which is the basis for a system of collegial decision-making, which is extremely complex, leading to decision-making by consensus, which limits its flexibility and capacity for innovation, and where the demands of society are very poorly represented". The current crisis has impacted the Spanish universities' public funding, decreasing the resources for research and affecting personnel policy (non-renewal of contracts, freezing of new positions). This has exposed the limitations of the governance system with regard to meeting the challenges of the future and the challenges of the current situation.

In the last two decades (Samoilovich, 2007 and Garcia-Sicilia 2009), many European governments, mainly from central and northern Europe, have promoted significant modifications in the governance systems of universities, the vast majority of which are public, aimed at giving them more autonomy to determine their strategic objectives. To that end, they have given them a greater capacity to manage their budgets, develop their staffing policy, manage their academic programs and to participate in the selection of students and the setting of tuition fees. The countries which have carried out the most profound reforms of their university systems include: Holland, Denmark, Finland, Portugal, Sweden, Austria and France. Moreover, in this process, the executive capacity of the Rector and his management team has been strengthened. As a result of these changes, efficient mechanisms have been developed to make the university more accountable to society.

The greater autonomy granted to the universities does not mean self-government. Greater autonomy presupposes that universities have a greater capacity to differentiate themselves, to compete among themselves, so that academics have freedom to teach

and conduct research, and to provide the best possible response to the demands of society. These goals can be achieved more easily if the university is governed by a body on which the stakeholders are represented and have the capacity to designate the highest executive authority, to approve the institution's strategic lines, to approve the budget and its implementation, and, ultimately, to account to the society that funds it.

It is well known that there is no single model of organization but, if any conclusion can be drawn from the different university reform processes carried out by a significant number of European countries, it is that they all tend to feature a governing body with a small membership, including a wide representation of public figures not directly linked to the university, which has the power to appoint the rector, the highest authority responsible for the institution's administrative and academic activity. Moreover, this governing body, as has been pointed out, is responsible for approving the institution's strategic objectives and budget. The rector's executive capacity is also strengthened, inasmuch as s/he has the power to appoint his management team and the deans, who form part of the team. Academics are represented in a body, such as the senate, which has an advisory role, particularly relevant in academic questions.

Thus, as Aghion (2010) has pointed out in his analysis of the governance of universities of excellence, it is a question of achieving a balance between executive and administrative legitimacy, reflected in the governing council with public figures external to the university itself, and the academic legitimacy that is embodied in the senate, that represents the collegial nature of the University, and in the executive organization of the university, rector, governing council.

The balance between executive and academic legitimacy is organized differently in different countries. However, as noted by Aghion (2010), some common characteristics can be distinguished:

- Under different forms, the governing council is the highest executive body with competence both in the field of management (strategy, election of the rector, human resources and finance) and the academic arena, with the support, in this case, of collegial academic bodies.

- The governing boards have small memberships, while the academic bodies, representing the teaching community, are larger.
- The composition of the councils is variable. In the US, there is a prominent presence of members from outside the institution (patrons, alumni, corporate executives) whereas teachers are not greatly represented, because they already participate in the academic senate. In the United Kingdom, the governance gives teaching staff a more important role.
- Management is often shared between an executive and an academic. Management has wide powers within the framework of a general delegation from the Council, this power being supervised by a collegial, administrative or academic control function.
- The core of the universities of excellence is organized around high level scientific departments (graduate schools), endowed with their own governance.
- The ad hoc committees constitute an original and informal form of association between the institution's professors and other staff, to study the various issues facing the university.

The Spanish university has not been party to such reform processes. As has been pointed out, after the major impact represented by the 1983 reform, which put an end to the university model developed under the Franco dictatorship, subsequent changes to the legislative framework (the 2001 Organic Law and its amendment in 2007, did not cause significant changes in the governance of universities. Recently, however, the increased international presence of Spanish universities, the growing importance of certain incentives in the regular activity of academics and the rising demand for a more important role for the university in the reorientation of the Spanish economy growth model have increasingly led the university system's stakeholders, including of course the students themselves, to manifest their views in relation to the direction that university reform should take. The government has not been indifferent to this process, promoting the establishment of committees of experts charged with proposing guidelines for the reform of the Spanish university model. In the past three years, three particularly significant documents have been published. In chronological order, the first was produced by an international commission within the framework of the

2015 University Strategy (VVAA, 2011), the second, was prepared by a group of experts designated by the Catalan parliament (VVAA, 2012) and the third, and most recent, was prepared by a committee of experts appointed by the Ministry of Education, Culture and Sport, which presented its findings last February (VVAA, 2013).

The three papers coincide significantly in what should be major aspects of the reform of Spanish university governance but, at the same time, they present more varied assessments of aspects that define the scope of university autonomy such as, for example, the policy on teaching staff.

With regard to defining the powers of the university's highest governing organ, the three documents agree this body should have a limited membership, it should include a large number of public figures not directly linked to the university and its powers should include the designation of the rector, who does not necessarily have to be a professor of the university, together with the approval of the strategic guidelines of the university and its budget.

In other respects, however, there is less coincidence. Among the most notable of these is the policy on teaching staff. While the first two documents cited opt to develop permanent positions with an employment contract, the third one reintroduces a system of prior qualification similar to that which existed in the 2001-07 period for civil service positions in the faculty.

Leaving aside the similarities and discrepancies between these documents, they all agree on the need to reform the university model in line with recent and current developments in the European countries with the leading university systems. The aim, shared by all the countries, is that the university should contribute to the improved competitiveness of their economies.

Improving the performance in general of the universities, and developing excellence in those in a position to achieve it, means acting simultaneously in three directions: developing university autonomy, increasing the resources available to universities and implementing a system of incentives closely related to the conditions on which public resources are distributed among universities.

Spanish universities saw the resources at their disposal increasing until the impact of the crisis manifested its full force. They have also seen how public administrations have resorted to developing a system of incentives, through program-contracts developed with universities or through the development of new projects such as, for example, Science Parks or the Campuses of International Excellence. However, the availability of these resources and the response to incentives, without developing the universities' autonomy in the terms described above, may mean that these means and incentives will not have lasting effects because universities have not incorporated these possibilities into their strategic options and, in short, have not been responsible for choosing them.

Similarly, the development of autonomy and incentives without an increase in resources means that universities are not in a position to compete internationally; and developing autonomy and increasing resources without defining the incentives and strategic priorities required by society can lead to an inefficient allocation of resources and a limited economic impact.

The challenge then is:

- a) to increase the resources at the disposal of the universities, and to reverse, as soon as possible, the reduction in the public resources allocated to them, defining a financial framework as stable as possible;
- b) to build a system of incentives that orients the universities toward those challenges that society and its representatives consider relevant and, finally,
- c) to develop university autonomy in the following terms:
 - A small governing council with representatives not directly linked to the university and with powers to designate the rector and approve strategic guidelines and the budget.
 - A strengthening of the rector's executive authority, including the right to designate the management team, the deans and the heads of the university's main departments (administrative, teaching and research). The Rector should be accountable to the governing council for his performance.
 - Ensure the participation of academics through a Senate or similar body, so that progress is made

toward a balance between the executive and academic units.

- The university should have greater scope to develop its academic staffing policy: recruitment, establishment of working conditions, with a proper balance between the permanent and temporary positions, and prioritizing recruitment as a way of tightening the bonds between faculty and the university.
- Greater involvement of the university in the definition of its academic program of undergraduate and postgraduate courses and in the selection of new students.
- The financial framework should be more stable over time and should define the university's relations with the relevant public administration, in which the program-contracts are developed with the universities, and the share of goal-based funding. Resources for research should fulfil similar parameters, being adapted to the initiatives developed by European institutions for this purpose. Universities should also be able to participate in the setting of public prices.

References

- AGHION, P.; DEWATRIPONT, M.; HOXBY, C.; MAS-COLELL, A.; SAPIR, A. (2007). [“Why reform european universities”](#). *Bruegel Policy Brief*.
- AGHION, P.; DEWATRIPONT, M.; HOXBY, C.; MAS-COLELL, A.; SAPIR, A. (2008). [“Higher aspiration: An agenda for reforming european universities”](#). *Bruegel Blueprint*, 5.
- AGHION, P.; DEWATRIPONT, M.; HOXBY, C.; MAS-COLELL, A.; SAPIR, A. (2009). [“The governance and performance of research universities: evidence from Europe and the U.S.”](#). *NBER working paper series*, 14851.
- AGHION, P.; CETTE, G.; COHEN, É.; LEMOINE, M. (2011). [“Crise et croissance: une stratégie pour la France”](#). Conseil d'Analyse Economique, Direction de l'information légale et administrative.
- FUNDACIÓN BBVA and IVIE (2011). [“Fuentes del crecimiento y productividad en España”](#). *Cuadernos de capital y crecimiento*, núm. 7.
- FUNDACIÓN BBVA and IVIE (2012a). [Universidad, universitarios y productividad en España](#). Francisco Pérez García y Lorenzo Serrano Martínez (directores).
- FUNDACIÓN BBVA and IVIE (2012b). [Crecimiento y competitividad. Motores y frenos de la economía española](#). Informe Fundación BBVA-IVIE 2012. Francisco Pérez García (director).
- FUNDACIÓN CYD (2013). [Informe CYD 2012. La contribución de las universidades españolas al desarrollo](#).
- GARCÍA-SICILIA, F. (2009). [“Gobernanza en las instituciones de educación superior. Tendencias”](#). *Informe CYD 2008*.
- MISSION AGHION (2010). [“L'excellence universitaire: leçons des expériences internationales”](#). Rapport d'étape à Mme V. Péresse, Ministre de l'Enseignement Supérieur et de Recherche.
- MORA, J.G. (2011). [“Formando en competencias: ¿un nuevo paradigma?”](#), Colección documentos CYD, 15/2011, Fundación Conocimiento y Desarrollo.
- MORA-SANGUINETTI, J.S.; FUENTES, A. (2012). [“An analysis of productivity performance in Spain before and during the crisis: exploring the role of institutions”](#). *Economics Department Working Paper*, 973, OCDE.
- SAMOIOLOVICH, D. (2007). [“Escenarios de gobierno en las universidades europeas”](#). Colección documentos CYD, 8/2007, Fundación Conocimiento y Desarrollo.
- VANDEBUSSCHE, J.; AGHION, P.; MEGHIR, C. (2006). [“Growth, distance to frontier, and the composition of human capital”](#). *Journal of Economic Growth*, vol. 11.
- VV.AA (2011). [“Audacia para llegar lejos. Universidades fuertes para la España del mañana”](#). Comisión de expertos internacionales, Estrategia Universidad 2015.
- VV.AA (2012). [“La millora de la governança universitària a Catalunya. Reptes, propostes i estratègies”](#). Ponencia para el estudio de la gobernanza del sistema universitario en Cataluña.
- VV.AA (2013). [“Propuestas para la reforma y mejora de la calidad y eficiencia del sistema universitario español”](#). Comisión de expertos para la reforma del sistema universitario español.

EuropeG is composed of Antoni Castells (director), Manuel Castells, Josep Oliver, Emilio Ontiveros, Martí Parellada and Gemma García (coordinator).

This Policy Brief reflects the group's position, and the contributions of its members, on the basis of a first draft prepared by Martí Parellada.

EuropeG

Parc Científic de Barcelona
Baldri i Reixac, 4
08028 Barcelona
Tel. +34 93-4033723
www.europeg.com



With the support of:

