

APPROACH TO THE BASQUE REGIONAL SYSTEM OF INNOVATION AND ITS ROLE IN THE TRANSFORMATION OF THE PRODUCTION MODEL

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I. INTRODUCTION

The Basque Country is one of the regions that has comparatively more and better withstood the impact of the current crisis, due in part to the development of a more stable and robust economy than other parts of the country during previous decades. Being one of the last communities to enter recession, it has held for more than three decades a continuous commitment to R & D, embodied in the consolidation of a Regional Innovation System (RIS) composed of many agents, and understanding it as a powerful lever for economic and social transformation. In this light, this article has a dual and interconnected purpose: First, to assess the role that infrastructure and agents of that system members have played in the transfer of knowledge and capacity building in the Basque companies to better tackle the productive transformation process aimed and successfully overcome the poundings of the current crisis. And secondly, try to go a little further and prove if indeed, that function and that investment in R & D performed, has had an effect and some relevant results in the two parameters outlined above. In this regard, and after a first section in which the differential competitiveness in the Basque region is assessed into national (and even European) context, insisting briefly in the starting conditions and implemented policies, the key and dynamic features RIS evolving as its basic pillar of the measures promoted by the Basque Government in order to modernize and provide its productive competitiveness are set out below. With this aim, a brief review of the main science and technology plans and actions in the field that support innovation in the region, deepening parallel in the characterization of the system components and their spatial distribution is also done.

Eventually, in the third paragraph, we try to point out, with a critical and comparative approach, the main achievements and evidence obtained from different analytical perspectives regarding the purpose of the work and the changes that should be introduced to further and better optimize their role as providers of training and knowledge, not only technological,

but also in other terms, that companies need to marshal from outside to be able to innovate and change. From a methodological perspective, the text takes as a fundamental base the review of the existing literature on the subject (articles, monographs, proceedings, etc.) as well as the information and data mining hold in various reports and statistics fundamentally INE (INEbase), EUSTAT, Eurostat, OECD, Basque Institute of Competitiveness, etc.

II. BASQUE COUNTRY DISTINCTIVE COMPETITIVENESS IN THE NATIONAL AND EUROPEAN CONTEXT

As we known in the second quarter of 2008 also extends to Spain the great recession and in just five years the GDP declines in Spain 7%, job losses reaches 18% of workers, and the unemployment rate rises over 26% of the workforce (Funcas, 2013) However, the entry into economic recession has not been produced at the same time in all regions of the state and the intensity with which it has been suffered has not been uniform. Several studies about the extent of the crisis in Spain from a territorial approach reveals that there are significant differences between them, within a common regressive period affecting all regions. Their behavior and action analysis during the crisis reveals, together with some major structural problems, starting conditions and differential policies and strategies in explaining the contrasts in their economic performance. In this respect, and in a synthetic exercise, analysis of the INE (National and Regional Accounts) on employment, affiliation to the Social Security, unemployment and industrial production between 2008 and 2013 show the impact of the recession in Spain and the differences between their territories. The combination of all these indicators place Valencia, Castilla-La Mancha and Andalusia as the hardest hit group while the less impact has been suffered by Navarra, Madrid and specially all the Basque Country being the Basque Country the less affected. This different impact on Spanish regions encourages us to deepen the successful Basque case, since indeed and as revealed by the scholarly publishing, its growth model has different features than the national average and, especially, the most affected regions. Thus, and as reflected in numerous surveys, the growth of per capita GDP in Spain during the economic expansion was mainly based on employment rate increasing, with a very mediocre productivity growth record. However, in the Basque Country employment rate increase was accompanied by a growth well above the national average productivity. Similarly, with the crisis, the sharp employment adjustment has increased the apparent labor productivity in the whole of Spain, while in the Basque Country employment has fallen less and productivity has also grown at a lower rate. Regional comparative analysis carried out by several authors not only national but also European level on the basis of a number of economic and innovative indicators, show that Euskadi is mainly characterized by particular starting conditions among which, compared to the national average, stand out higher per capita GDP (in fact, the highest in Spain), a qualified employment (tertiary), a powerful industrial sector and in particular a greater capacity for innovation. In addition, the Basque Country has shown less dependence on the construction sector in the composition of its production structure, and this is another differentiating factor, allowing to understand, together with other agents (peculiar system of governance, economic agreement, etc.) its outperformance.

All this requires likewise to deepen in developed strategies and public policies, largely key of the competitive advantages genesis in the area. Thus, in fact, as mentioned above, rather than applying the policies of internal devaluation based on the labor costs reduction dominant in the whole country, Euskadi has kept the investor pulse in R & D (ranking the first position of the Spanish regions) with special involvement by the private business sector compared with the lower relative weight of public spending. Also noteworthy is the commitment to the industry as a basis for the competitiveness boost of its economy, with notable progress in the sector diversification and the formation of clusters, seeking to specialize in medium-high manufacturing technological level; and also the continuity in time of the horizontal policies of formation on specific assets, such as innovation, human capital, physical infrastructure and institutional assets.

III. BASQUE INNOVATION SYSTEM AND ITS ROLE IN THE PRODUCTIVE TRANSFORMATION OF THE REGION

As noted above, the Basque Country has traditionally stood out to start building and managing continuously a solid infrastructure of scientific and technological knowledge that has given it a clear distinctive advantage over other territories. Thus, it has implemented its own science policy, technology and innovation (STI), one of whose most notorious identifying marks lie in the creation and consolidation of its innovation system which, together with the Catalanian one, CA Madrid and Navarre, is considered among the best in the state.

III.1. Basque innovation system (RIS) profiling

The Basque RIS, along with Navarre fall within the so-called excellence systems based on business subsystem, positioning itself as the most advanced country-wide at the present time. According to the latest available data, both bring together 11.27% of innovative companies of the national total, 13.49% of the cost of business innovation and the 12.60% investment in R & D. The main driver of these systems is the corporate sector, which accounts for 18% of total domestic expenditure in Spain, while only receiving 6.10% of higher education and 4.40% for Public Administration. The scientific-technological and economic systems results are observed in the high-international (12.02%) and national (10.16%) capacity for patenting, to generate added value in manufacturing medium and high technology (17.80 % of total GVA of these sectors in Spain) and internationalization especially in manufacturing medium-high technology (17.67% of total exports in these sectors). They are supported by the business community and knowledge accumulated by different agents, as well as in the characteristics of the territory and its specific capabilities (Jordá,2014). In one particular approach to Basque RIS, it has traditionally distinguished from the Spanish regions and the OECD for several peculiarities: on the one hand, has been based mainly on technological centers, and to a lesser extent in the university system, with this feature as an idiosyncratic trait against other leading regions like Catalonia and Madrid, where RIS is based on the scientific potential of large universities. On the other hand, the crisis of the seventies brought to the surface more visible the weakness of the traditional sectors of Basque industry and an important part of business leaders, government agencies and other local groups identi-

fied the need to restructure the production system and boost competitiveness by innovation, knowledge and technological development. So the Basque RIS will emerge. However, the cornerstone of the system is the Basque Science, Technology and Innovation net-current RVCTI-, created in 1997 by the Basque Government with the aim of bringing together the efforts of public and private agencies to advance scientific knowledge, technology and innovation as a means to improve business competitiveness and contribute to economic and social development of the region. Its purpose is to develop a technological infrastructure able to catalyze networking in a coordinated market and customer oriented to offer a comprehensive technological offer to the Basque business world (Innobasque, 2014). RVCTI is divided into three major subsystems: a) the scientific and university (including universities and research centers of excellence (BERC 's, CIC's); b) the innovation and technological development (technology centers, sectorial centers, certification bodies and laboratory R & D units of companies, R & D health units, etc.); c) innovation support (technology parks, intermediaries, etc. (Innobasque, 2014). All this network of agents and organizations is the result of different actions implemented through various plans and policies on industrial competitiveness and especially in the field of science and technology driven especially by the Basque Government through its Department of Industry and Education.

III.2. Science and Technology policy in the Basque Country: main stages

This policy has a track record in Euskadi that goes back more than three decades since its inception in the early 80s, having been characterized by continuity over time in terms of their major objectives and many of his performances. Their common denominator lies in a strategic basis adapted at all times to the economic situation of the environment. Its development has been managed from a global vision thus firstly trying to respond to competitive industrial short-term needs of the Basque economy, while opening areas of industrial diversification from their own abilities; and secondly, developing strategies to medium-long-term and trying to build an RIS articulated and increasingly open to the world (Basque Government, 2011: 40). There are three major logical and chronological stages in the evolution of science and technology policy of the Basque Country: 1) The period 1980-1996 can be considered a period of capacity building - "supply policies" - in which the foundations of targeted RVCTI are built, guiding all measures to lay the foundations and infrastructure of the new economy emerging from economic and social restructuring of the Basque Country and has its greatest exponent on the support and protection of technology centers; 2) 1997-2005 is a period of "combined policy of supply and demand" in which efforts are mainly directed to the consolidation of RVCTI (former SARETEK), created in 1997, and the attention of priorities in knowledge technology and key business stakeholders innovation . 3) Finally, 2006-2015 period, in the context of the Basque Strategy 2015 and plans on the basis of science, technology and innovation in 2010 and 2015, could be called "results oriented policy", whose main targets are directed both to the diversification of the business as well as to achieve tangible results in terms of science, technology and innovation (participation in international projects and EU framework programs, patents, etc.) in order to deal with the challenges of increasing globalization and competition from new EU member countries. In this context, the 2015 STIP again recognizes the growing importance and impact of science and technology in a

society that walks towards the knowledge economy, planning an ambitious future in nearly a dozen targets, which will require a great effort by all agents of the science and technology system (Basque Government, 2011). The 2015 plan seeks to consolidate a second generation system of science and technology which has now the challenge to increase its scientific and technological productivity and their contribution to the creation value in the form of new products and services and also new businesses, securing place an gaining prominence at international level, and escorting businesses.

IV. MAIN ACHIEVEMENTS OF INNOVATION POLICY IN THE BASQUE COUNTRY

IV.1. Basque country R&D compared performances general overview

The results of R & D in the Basque Country show that, in regards to research spending and development and investment efforts (spending relative to GDP), the positioning of Euskadi is very positive (2.19% of GDP in 2012), showing a relative level well above the Spanish average (1.30%) and even in the line shown by the average displayed in the EU27 (2.08%) (Eustat, Eurostat). As for human resources, according to the same source, the ratio of total staff (EPD) in relation to total working population of each region is also superior in Euskadi, remaining first in the regional ranking (21.63%), compared to the national average where staff involved in R & D accounts for almost half (12.32%). The same is true if we look at the proportion of research personnel (EPD), which represents 13.73% of the employed population in the Basque Country compared to 7.48 % on average in Spain

However, the significant investment in R & D is not homogeneous from the spatial point of view between the three Provinces. Vizcaya is the one that concentrates the bulk of investment in R & D with 45.81% of the total, followed by Gipuzkoa with 41.55% (over 570 million) and, rather more behind with 12.65 Álava %. However, the share of R & D on GDP, compared to 2.12% and regional average according to Eustat, emphasizes the effort made in Guipuzcoa, with 2.71%, followed by Vizcaya (1.90%) and finally Álava (1.66%) (Eustat, 2013).

IV.2. Overview of R & D in the Basque Country by innovation system agents

To put it in a nutshell, the analysis of R & D from the perspective of the members of the Innovation System agents reveals distinctive relevancy degrees in their role linked to the transformation of the Basque economic model. On the one hand, we must stress the importance of companies and technology centers. Regarding the former, the innovatives percentage is higher (approximately 85% and 90 % of all companies) and have proved better performing in most aspects analyzed (employment, products, processes, added value, export, etc.). Most of the spending on R & D in Euskadi falls on them, contributing to improve the competitiveness and modernization of the productive fabric. Technology Centres are another key element of the Basque innovation system, transferring knowledge and providing services to these companies. However, the results of the collaboration with these and especially other agents of the system have not always been sufficiently successful. Universities with Research Institutions depending on Public Administration represent the system of scientific

research and technological development of the Basque Innovation System. The analysis of its role in transforming the production model reveals, despite significant recent progress, little comparative degree of involvement and weak relationship with the other players in the system, being necessary to implement areas for improvement.

V. CONCLUSIONS

The present document had a dual purpose : to assess the role that infrastructure and RIS Basque agents have played in the transfer of knowledge and capacity building in their companies to better tackle the productive transformation process aimed and successfully overcome effects of the crisis; and try to go a little further and check as much as possible if that investment in R & D done has had an effect and some relevant results in the relatively better response to the crisis experienced by the region and the transformation of its production model. Analyzing in detail the improved economic performance of the Basque Country in the state framework (and even within the scope of the EU), and characterize the Basque RIS in the context of public policy driven, bring us to the next conclusions: The Basque RIS is one of the best in the state having great national and international recognition. Analysis of innovation indicators, both in regard to spending and human resources devoted to R & D, reveals a highly positive positioning of Euskadi, showing a higher level relative to the Spanish average, even above the average of the EU countries. Investment in R & D has been constantly growing, clearly showing the commitment to a development model clearly oriented towards innovation in terms of excellence. The structure of expenditure on R & D by the principal agents of the innovation system demonstrates the important role played by the business sector. And so the analysis of the effects of the role of innovation on innovative firms, reveals conclusive and positive data both from the perspective of their best behavior regarding the crisis as it relates to the alleged transformation of the economic model towards higher data sectors added value and technological content, resulting business innovation a pillar at the exit of the crisis and its smaller relative impact. However, the analysis of the role of the different agents of the Basque RIS also reveals important differences among them, highlighting the companies and technology centers as the most active elements of the system. The main weaknesses or failures of this, the interrelationships between companies and technology infrastructure (technological and scientific centers (University) have failed to have the density level that would be desirable to generalize innovative behaviors to all Basque companies. The increase of relations will therefore be a critical factor in improving innovative business environment and higher education institutions themselves. It is necessary, therefore, to further enhance the interrelations and cooperation between all actors in the system being unavoidable to delve into stimulant improving actions in this regard.