Orkestra
BASQUE INSTITUTE
OF COMPETITIVENESS
DEUSTO FOUNDATION

The Basque Country Competitiveness Report 2015

Productive Transformation in Practice

Deusto
University Press

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The work carried out by Orkestra-Basque Institute of Competitiveness of Deusto Foundation, University of Deusto is made possible thanks to the support of the following organisations:

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2015
Orkestra - Basque Institute of Competitiveness
Deusto Foundation

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© Publicaciones de la Universidad de Deusto
Apartado 1 - 48080 Bilbao
e-mail: publicaciones@deusto.es

ISBN: 978-84-15759-69-0
Legal register: BI - 1.208-2015

Printed in Spain.

Printed on recycled paper.

Transformación productiva en la práctica

Avanzar en la transformación productiva de la economía vasca es un reto permanente. Pero, ¿existen recetas únicas?, ¿tiene sentido aplicar las mismas políticas a todas las empresas, sectores o territorios? Partiendo de la economía de la innovación, que sostiene que la transformación productiva requiere respuestas a medida, el Informe de Competitividad del País Vasco 2015 analiza cómo son y cuál es el comportamiento competitivo de los diferentes ámbitos de aplicación de las políticas para la transformación productiva. Para ello analiza la situación de la competitividad de la CAPV; profundiza en factores como el tamaño o la propiedad del capital que influyen en el comportamiento y resultados de las empresas; ahonda en el estudio de sectores y clústeres y examina las tres prioridades temáticas fijadas por el PCTI-2020: la fabricación avanzada, la Energy y las biociencias-salud. Teniendo en cuenta la importancia de la dimensión territorial para la transformación productiva, desarrolla, asimismo, un análisis provincial, comarcal y municipal. Por último, determina dónde se sitúa la CAPV con respecto al estado del arte internacional en políticas de competitividad, identificando los retos críticos para asegurar que las políticas de competitividad son capaces de apoyar de forma efectiva las estrategias actuales y futuras del territorio.

Informe

http://www.orkestra.deusto.es/competitividadcapv/imgs/informes/2015-orkestra-informe-competitividad.pdf

Dataset del Informe

http://data.orkestra.deusto.es/dataset/informe-de-competitividad-del-pais-vasco-2015

Ekoizpenaren eraldaketa praktikan

Euskal ekonomiaren ekoizpenaren eraldaketan aurrera egitea etengabeko erronka da. Baina, ba al da errezeta berezirik? Politika berberak erabili behar al dira enpresa, sektore edo lurralde guztietarako? Berrikuntzaren ekonomiak dio ekoizpenaren eraldaketak neurrirako erantzunak behar dituela. Ideia hori abiapuntu hartuta, Euskal Autonomia Erkidegoko Lehiakortasunari buruzko 2015eko Txostenak aztertzen du ekoizpena eraldatzeko politiken askotariko aplikazio esparruak nolakoak diren eta, lehiari dagokionez, nola jokatzen duten. Horretarako, Euskal Autonomia Erkidegoko (EAE) lehiakortasunaren egoera aztertzen du; enpresen portaeran eta emaitzetan eragin nabarmena duten faktoreetan sakontzen du, esate baterako, tamainan edo kapitalaren jabetzan; sektore eta klusterren azterketan barneratzen da; eta 2020rako Zientzia, Teknologia eta Berrikuntza Planean zehaztutako hiru lehentasunak lantzen ditu: fabrikazio aurreratua, energia eta biozientziak-osasuna. Lurraldeak ekoizpenaren eraldaketan duen garrantzia kontuan hartuta, probintzia, eskualde eta udalerrien azterketa ere egiten du. Azkenik, lehiakortasun politikei dagokienez, nazioartera begiratuta EAE non dagoen ere zehazten du eta erronka kritikoak identifikatzen ditu, ziurtatzeko EAEko lehiakortasun politikak gai direla lurraldearen gaurko eta etorkizuneko estrategiei eraginkortasunez laguntzeko.

Txostena

http://www.orkestra.deusto.es/competitividadcapv/imgs/informes/2015-orkestra-txostena-lehiakortasuna.pdf

Txostenaren dataset-a

http://data.orkestra.deusto.es/dataset/informe-de-competitividad-del-pais-vasco-2015

Productive Transformation in Practice

The Basque economy faces the continual challenge of moving forward in its productive transformation. However, are there any single recipes? Does it make sense to apply the same policies to firms, sectors or territories alike? Based on the Economy of Innovation, which argues that productive transformation requires tailor-made answers, the 2015 Basque Country Competitiveness Report looks into the competitive behaviour of the different realms on which policies for productive transformation are applied. For this it analyses the competitive situation of the Basque Country; delving into factors such as size or ownership that clearly affect the behaviour and results of firms; considering sectors and clusters and examining the three thematic priorities set by the PCTI-2020 (Basque Government's 2020 Plan for Science, Technology and Innovation): advanced manufacturing, energy and biosciences-health. Keeping in mind the importance of the territory in productive transformation processes, it also includes analyses on a provincial, county and municipal level. Lastly it positions the Basque Country with regards to the international state of the art in competitiveness policies, identifying critical challenges to assure that the competitiveness policies of the Basque Country are capable of supporting effectively the current and future strategies of the territory.

Report

http://www.orkestra.deusto.es/competitividadcapv/imgs/informes/2015-orkestra-report-competitiveness.pdf

Report Dataset

http://data.orkestra.deusto.es/dataset/informe-de-competitividad-del-pais-vasco-2015

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Letter from the Chairman

It is my pleasure to present *The Basque Country Competitiveness Report 2015*.

This analysis on competitiveness in our territory, published every two years, is the main tool for communicating the research developed by the Institute to fulfil its mission as an agent of change.

In *The Basque Country Competitiveness Report 2015*, Orkestra takes the key message of the 2013 report a step further, in the sense of moving forward with the productive transformation of its economy.

While the 2013 report addressed the necessary features of the productive transformation strategy in the Basque Country, the 2015 report explains the practical implications of this transformation, analysing the different fields of application of productive transformation policies and their competitive behaviour patterns.

With this project, the Institute wishes to contribute to the construction of an economic and regional strategy that is able to maintain the remarkable competitive level of our territory while, at the same time, improving the social indicators that have a direct impact on the wellbeing of the population.

We would like to thank and acknowledge all those who have participated in preparing and working on the report.

We would also like to extend special thanks for the invaluable encouragement from our sponsors, as well as the institutions that have supported us and the society that we serve.

We hope that this project proves worthy of the trust placed in us.

Ignacio Mª Echeberria
Chairman
Orkestra-Basque Institute of Competitiveness
Deusto Foundation

Acknowledgements

This report has been prepared with funding from SPRI (Basque Business Development Agency), an agency of the Basque Government. Through aid and services, it seeks to stimulate the economic growth of Basque firms in order to create wealth and wellbeing in the Basque Country.

Orkestra's entire team of professionals has been involved in preparing *The Basque Country Competitiveness Report 2015*, coordinated by researcher Mikel Navarro. We thank them for their rigour, dedication and commitment throughout this entire process. We would also like to express our gratitude for the contributions of institutions and professionals with ties to the Basque Institute of Competitiveness: the chairman of the Basque Institute of Competitiveness, members of the Board of Directors, Advisory Board, Monitoring Committee and Energy Chair's Sponsor Committee.

In addition, in line with the institute's philosophy of moving forward along the path of collaboration and institutional specialisation, rather than duplicating efforts, other experts have also been involved in preparing this report. The work carried out by these experts, which has provided the foundation for drafting this report, is contained in a collection of documents known as *Competitiveness Report 2015 Cuadernos*. The Institute thus thanks Alberto Alberdi (Directorate of Economic Affairs and Planning, Basque Government) for his work on labour costs, profitability and productivity; Xabier Sabalza (DeustoTech) for his collaboration on the study on Industry 4.0 in the Basque Country in relation to advanced manufacturing; and Jesús María Valdaliso (UPV-EHU) for his contribution to the analysis of the literature on clusters, global value chains and platforms, as well as the Energy Cluster and Advanced Manufacturing Platform. Other collaborators who prepared analyses included in the *Competitiveness Report 2015 Cuadernos* are Nora Sarasola (Bilbao Ekintza); Pedro Iturbe and Ugaitz Iturbe (Provincial Council of Gipuzkoa); Mariangélica Martínez, Nerea González and Saioa Arando (Mondragon Unibertsitatea); and Goieki, Goierri Regional Development Agency, to whom we are also extremely grateful.

The quantitative analyses which have served as the basis for preparing this report could not have been performed without the full collaboration of Eustat (Basque Statistics Office), allowing specific use of its databases, or without the detailed explanations and clarifications provided in response to the many questions which emerged in working with them. At Eustat itself, our most sincere thanks to the management and technical staff (Mariví García-Olea, Jose Miguel Escalada, Nekane Madariaga del Arco, Celia Muro, Javier San Vicente and Pilar Vazquez), who

provided such professional and patient service. And to Eva Mª Rodríguez and Sabi-Informa, for enabling us to utilise their database for research purposes.

We would also like to express our thanks for the assistance of a large group of people who provided data, contributed qualitative information through interviews and other methods, or participated in checking the report:

Javier Abascal (Banco Sabadell Guipuzcoano), María Aguirre (Department of Health), Asier Albizu (Biolan), Peio Alcelay (Ampo), Juan Jesús Alegría (Alegría-Activity), Ángel Alonso (Mestra), Juan Carlos Alonso (Luma Industrys), Mikel Alvarez (Health MCC), Guillermo Amann (Ormazabal), Eduardo Arechaga (Confebask), Emilio Arranz (Provincial Council of Bizkaia), Alex Arteche (Grupo Arteche), José Javier Arteche (Arteche), Miryam Asunción (Nanogune), Vicente Atxa (Mondragon Unibertsitatea), Anton Azlor (Tubacex), Mentxu Baldazo (Irizar), Alex Belaustegi (Ingeteam-Indar), Eduardo Beltrán (MANU-KET), David Bernar (EKIN S.Coop.), Javier Calvo (Management Solutions), José Mª Castellanos (Energigune CRC), Enrique Castellón (CRB), Miguel Ángel Castillo (Aernnova), Ainara Celaya (Provincial Council of Bizkaia), David Coca (Management Solutions), Alberto Conde (NEM-Solutions), Ignacio de la Peña (Guivisa), José Manuel de la Sen (Petronor), Eliecer Diez (Progenika), José Esmoris (CIE-Automotive), Javier Etxeberria (Ibermática), Pedro Etxenagusia (ONA), Asier Extremo (Virtualware), David Fernández (SPRI), Raquel Ferret (Zigor), Amaia Ferro (Gipuzkoa Chamber of Commerce), Borja García (Loramendi), Carlos García (Mondragon Unibertsitatea), Izar Garitagoitia (Inyectados Gabi), Aner Garmendia (EGA Master), Xabier Garmendia, Jesús Mª Goiri (Energigune CRC), José Manuel González (Fuchosa), Jorge González Somavilla (Ormazabal), Xabi Gorritxategi (ACEDE), José Ramón Gorrochategui (Management Solutions), Aitor Guerra (Bilbao Chamber of Commerce), Aitor Guesalaga (Jaso), Jesús Mª Guibelalde (IMAT Mobiliario y Diseño, S.A.), Andoni Gutiérrez (Goizper), Manuel Ángel Guzmán (Management Solutions), Marc Handels (Salto Systems), Diego Herrero (Tubacex), Javier Herrero (Aernnova), José Ignacio Hormaeche (Energy Cluster), Marian Ibarrondo (SPRI), José Ramon Ipiñazar (Provincial Council of Bizkaia), José Iraolagoitia (Microdeco), Tomás Iriondo (GAIA), Julen Iturbe (Consultoría Artesana), Ugaitz Iturbe (Provincial Council of Gipuzkoa), José Juez (HEGAN), Eneko Ladislao (Metalurgica Marina), Jabier Larrañaga (Kutxabank), Gustavo Lascurain (Pasaban), Nerea Leal (Dynakin), Gonzalo Líbano (TESA), Andrés Llompart (Maier S.Coop.), Patxi López (Orkli), Juan Pedro López-Araguas (Basque Biocluster), Antxon López Usoz (DANOBATGROUP), Mikel Lorente (ACICAE), Luis Magro (Astilleros Zamakona), Guillermo Marco-Gardoqui (Progenika), Alberto Martínez (Lantek), Amaia Martínez (SPRI-Biobasque), José María Mato (Biogune CRC), Xabier Mitxelena (S21SEC), Ignacio Montalbán (Consonni S. Coop), Jose Miguel Munilla (Ramondín), Jesús Murga (ITP), Jesús Navas (Vicinay), Marcelino Novo (Fagor Automation), Txomin Olabarri (SPRI), Javier Olarte (Zigor), Javier Oleaga (Copreci), Tomás Orbea (Código Green), Xabier Ortueta (AFM), Kerman Osoro (CIE Automotive), Cristina Oyón (SPRI), Peio Pagola (Ingeteam-INDAR), Daniel Peñalba (Aernnova), Jorge Pérez-Pedrero (Gestamp), Carlos Pujana (Izar Cutting Tools), Luis Angel Ripoll (IDOM), Sergio Ruiz de Larrea (ONA), Agustín Saenz (Tecnalia), José Ignacio Saez (Irua), Norberto Santiago (ZIV), Fernando Sierra (Euskalit), Jorge González Somavilla (Ormazabal), Laureano Simón (Progénika Biopharma), Patricia Tamés (AFM), Iñaki Telletxea (SPRI), Emilio Titos (Mercedes-Benz), Josu Ugarte (MCC / Schneider), Eduardo Urrutia (Burdinola), Juan Mari Uzkudun and Mikel Zaldunbide Solaun (Ormazabal).

Orkestra assumes full responsibility for any errors or omissions contained in this report.

Executive Summary

Based on the idea expressed in the previous *Competitiveness Report* that sustainable growth cannot be conceived without the productive transformation of the economy, this *Competitiveness Report* focuses mainly on clarifying two aspects. Firstly, by analysing the competitive position of the Basque Country after eight years of crisis, we will look at its circumstances or specific situation today with regard to undertaking productive transformation. Secondly, since the productive transformation strategies or processes cannot be the same for all stakeholders and areas in the region, the analysis focuses on a series of variables that influence both company results and performance, and which, therefore, either enable or hinder productive transformation. These variables are: firm size, type of ownership, the industry in which it operates and the territory where it is located. We are not only concerned with the relative weight of firms according to their size, ownership structure, industry/cluster or territory, but also with their particular behaviour patterns and performance.

The general analysis on competitiveness presents a mixed picture. From the analyses compiled, we see that the impact of the crisis has had more severe repercussions on the Spanish economy and, accordingly, the Basque, than on the rest of the EU economies. Nonetheless, the level of competitiveness of the Basque economy, measured by the latest territorial and business competitiveness indicators (namely, GDP per capita and return on assets), and the main indicator of economic performance that makes them possible (productivity), is still significant. Furthermore, analysis of the financial statements of Basque firms shows that their financial situation is relatively sound, as the Basque Country is in a favourable position and evolution in its debt level and debt repayment capacity.

However, the crisis has had a particularly strong impact on social indicators, measured in terms of the general perception of wellbeing and the unemployment rate, which has continued to worsen. Job creation is, therefore, one of the main challenges facing the Basque Country today. The analysis of business indicators demonstrates that, while a significant number of Basque Country firms are in a solid financial and economic position to implement investment and growth policies and to benefit from the promising prospects signalled by forecasts and indicators from different international organisations, there is a large group of vulnerable firms, combined with a considerable number of firms that are experiencing losses and/or a significant debt level.

The public policies to be designed must take into account both of these situations in order to avoid moving towards a divided territory. Policies should combine investment and growth to allow for progress in the desired productive transformation and to resolve some persistent competitive challenges. They should also ensure that significant groups of businesses, employees or people are not excluded from the Basque Country's emergence from the crisis.

The analyses of firm size confirm the smaller number of large firms in the Basque Country. This result has implications for the competitiveness of the region since, as in other territories, the better competitive performance of large firms stands out in the Basque Country, especially in the industrial sector. However, unlike other territories, large firms in the Basque Country did not perform better during the crisis than smaller firms. When comparing firms in the same size bracket in different territories, we find that medium-sized Basque firms are relatively better positioned. Small firms present the greatest problems of competitiveness, both regarding firms in other size brackets and firms of the same size in other territories. These results show the need for public policies to address the challenge of size and to pay special attention to the needs of small firms.

The analysis on corporate ownership confirms, firstly, that the presence of firms with foreign capital in the Basque Country is still relatively low and that the presence of cooperatives is proportionately high (the latter even increased during the crisis). Secondly, both types of companies offer a solid base for productive transformation processes, as their behaviour and performance are more favourable than average for Basque firms, especially in the case of firms with foreign capital. However, aspects with room for improvement in both types of company have also been identified. The activity of firms with foreign capital in the Basque Country is mainly focused on production; they invest little in R&D and the cooperation with the knowledge infrastructure of the region is limited. With regard to cooperatives, there appears to be a certain inability to translate their efforts in innovation and internationalisation into economic results and they lack transparency.

An initial exploratory study on the hidden champions (international niche market leaders or INMLs) in the Basque economy, included in this report, reveals around thirty hidden champions in the Basque Country, indicating that the region is a fertile territory for INMLs. These are firms that have maintained stable growth rates in recent years, engage in ongoing innovation and have high patenting activity and a high degree of internationalisation. The good practices of these firms should be disseminated and encouraged, because they reveal an intelligent — and until now hidden — way of conducting productive transformation. However, once again, Basque INMLs face the challenge of size (they are approximately 10 times smaller than in other countries), as well as the availability of appropriate financing mechanisms and access to certain types of human resources.

Regarding the sector analysis carried out in this report, its objective is to identify what productive transformation took place in the Basque economy during the crisis. Specifically, it determines its competitive position and that of the industries linked to the three thematic priorities that have been selected by the RIS3. During the crisis the Basque Country continued to move forward on its productive transformation process, increasing its level of diversification so that today it has a balanced sectoral structure with its own profile of an advanced economy. In spite of the fact that

industry and construction lost relative weight during this period and, therefore, the importance of the services sector has increased, the Basque Country continues to have greater industrial specialisation and orientation. Within industry, there has been increased demand and a stronger tendency towards high-tech manufacturing. Even so, the sectoral structure of the Basque Country seems particularly sensitive to the current cyclical phase of the economy. Therefore, if the expected economic upturn signalled by several indicators is confirmed, the Basque economy in particular could benefit. It is worth noting that Basque industries saw positive improvement during the crisis in most of the competitiveness indicators studied.

With regard to the industries linked to the three thematic priorities that have been selected by the RIS3, each present different positions and challenges to competitiveness. The Biosciences Cluster represents a long-term commitment as it is still emerging, with a larger scientific and ground-breaking base. There are scientific/technological skills already available, the result of investments made in previous years, and to a lesser degree, corporate bases, to which the potential offered by the Basque health care system should be added. Among the challenges that this cluster faces today, the need to get all the components working together and functioning as a system, is key. These linkages are not only necessary between R&D infrastructure and biofirms, but also between government departments and agencies that could play a key role in promoting biosciences. The report also states that there needs to be greater interaction with other clusters from the Basque Country and with similar clusters from the neighbouring regions as well as plugging in to global value chains. In addition, the report identifies the weaknesses linked to the development of management capabilities and business development, as well as the need to address the challenges of growth and raising private capital (especially international).

It should be noted that the Energy Cluster is in a field of its own, due to its competitive position, and the strength of the Basque Country in this sector, as well as the attractiveness of its activities (R&D intensity, qualified staff, productivity, etc.). Among the cluster's strengths it's worth noting the presence of energy, scientific and technological infrastructure and the existence of training centres with sector-specific activities. It also has an industrial legacy linked to the long-standing tradition of electricity with firms that are economic drivers, some of them world leaders in their respective areas. The cluster is formed by relatively mature value chains and some emerging ones, so it offers significant opportunities for diversification. One of its key challenges is the need for greater coordination between different institutions and agencies in the energy field, as well as the need for cluster-promoting policies that take into account the different stages of development in different value chains. Some firms in the clusters have little financial muscle and their size presents a challenge. Lastly, integrating local providers and reinforcing the position of Basque firms in the value chains might be positive, as well as greater inter-cluster collaboration both within and beyond the Basque Country.

Unlike the two priorities previously indicated, advanced manufacturing is not linked to a specific sector, but could be applied to any industrial sector independently of its technological content. This feature gives advanced manufacturing a more complex organisation, meaning the activities that shape it are more like a platform than a cluster. It is a critical activity for the Basque Country, as it is the priority that encompasses a higher proportion of its gross value added (GVA). Thus, even though the priority is still focussed on the most well-developed corporate and scientific skills,

it is of particular concern that its recent development has not been very positive and that its competitive position is mixed. Among the challenges ahead, those related to R&D&I activities are particularly significant: a small number of firms with their own product and an excessive orientation towards processes; poor development of non-technological innovation; low standardisation; and limited capabilities of firms to incorporate and integrate ICT into their value proposal thereby offering new services associated to the products (servitisation processes) or creating new business models. The small average size of Basque firms and the relative lack of specific financing mechanisms mean that it is difficult for firms to address these challenges by themselves, thus the importance of inter-business cooperation.

In short, the analysis of the three thematic priorities selected by the RIS3 — biosciences, energy and advanced manufacturing — shows that the three have differing degrees of maturity and, therefore, different competitive challenges and positions which also require different measures and responses.

Lastly, taking into account that all economic activity and productive transformation is affected by the territory where it occurs, knowing the territory well is of prime importance. It is key, both for the strategies and policies that are designed at higher levels (but which affect this territory) and for the possible strategies or actions that it would be desirable to set in motion in this territory. At historical territorial levels, we observe significant territorial cohesion, reflected in relatively small differences in the competitive performance indicators (productivity, exports, GDP per capita). Structurally, we can see common features, such as a highly qualified population, but also differences. Among the latter, the following are particularly noteworthy: the greater specialisation in services and the greater weight of large firms; the concentration of the thematic priorities of energy and biosciences in Bizkaia; in Gipuzkoa and Álava, the greater weight of industrial activity and orientation towards advanced manufacturing; the significant presence of cooperatives in Gipuzkoa and firms with foreign capital in Álava. As we drill down on the territorial scale to analyse counties and municipalities, the differences increase, although relatively high territorial cohesion in comparison to what is common in other territories can be observed.

The relatively small differences and common trends found in the analysis might be a positive argument for maintaining joint policies, because when common problems are treated jointly, it makes it possible to exploit several types of economies of scale and scope, such as whether one could argue that the cohesion noted is also partly a result of common policies (e.g, in education). However, when designing productive transformation strategies, the unique features identified should also be taken into account. In this sense, the county and local typologies developed in this report may be useful when designing land use and territorial cohesion policies, to be able to take their characteristics into account and adapt the policies accordingly. It may also help identify other territories that share some of their problems and with which they can undertake benchmarking exercises, learn good practices or propose joint actions.

While every section of the report includes public policies in one way or another and in each subsection of this summary there is a reference to the policies that should be initiated in each case, the report also has a specific section that reflects on the development strategy applied by the Basque Country and the competitiveness policies on which it is based. Thus, from the analysis of the Basque Government's

plans and programmes related to competitiveness, a series of challenges for the competitiveness policies are identified. Firstly, it is of significance the need to move from considering economic, social and environmental development as separate elements to understanding their inter-relation. Secondly, there is the importance of working to create a shared vision for the main territorial stakeholders that operate in the area of competitiveness. Thirdly, we must conceive strategy more as a process than as a plan, understanding the role of public policies and their relationship to the strategy. The report concludes that to put all of this into practice, it is necessary to work on building new governance and innovation models in the public administrations, inter-institutional and intra-institutional coordination and new leadership models, as well as equipping the process with strategic intelligence to incorporate new instruments to serve the strategy.

Introduction

As posited in the introduction of the previous *Competitiveness Report*, development economics has convincingly shown that sustainable economic growth cannot be conceived without the transformation of the productive sector of the economy. It is not surprising, then, that since Orkestra was created and the first *Competitiveness Report* published in 2007, the main theme in every report, under one name or another, has been productive transformation. In some cases, it was referred to via the metaphor that the Basque Country should move from a competitive stage based on efficiency to one based on innovation. In others, such as the 2013 report, the issue was addressed by trying to identify the key levers the Basque Country should use to carry out the productive transformation that would enable it to grow and emerge from the crisis. In any event, productive transformation is approached in the reports from the specific context of the moment in time when they were written, which affects the perspective (whether short- or long-term, more incremental or more ground-breaking, etc.) from which it should be addressed.

Productive transformation is key for sustainable economic development

In the two years that have passed since the last report, many initiatives to advance productive transformation have been undertaken by different actors, both private and public, particularly to utilise what the previous report called the 'first lever for productive transformation': Strategies for Smart Specialisation. An example of this can be seen in the recently approved Plan for Science, Technology and Innovation (Euskadi PCTI-2020) led by the Basque Government, as well as in initiatives carried out at other administrative levels or by private and public organisations (provincial councils, provincial capitals, counties, etc.). Moreover, in the European Union (EU), all the regions have drawn up and presented their RIS3 strategies to the European Commission, as this was a prerequisite for obtaining structural and investment funds. Orkestra researchers have been involved in many of these processes, supporting and advising stakeholders during their strategic reflection. One issue that came up repeatedly was that the strategies and productive transformation processes cannot be identical for all stakeholders in the region.

A saying that has appeared in the literature on regional innovation systems, and that analysts have rapidly adopted and repeated many times, gives the warning: 'One size does not fit all'. Even though they are all from the same region, their circumstances are not the same, so a 'one size fits all' approach is not valid. Meanwhile, it also seems obvious that, since all are different, we cannot customise policies or answers for each of the approximately 160,000 firms that operate in the Basque Country.

The formula 'one size fits all' is not valid

This would not only exceed financial resources, but, especially, the ability of public policy makers to design, manage and develop such measures. We are left with two questions: *How far do we go to specify or adapt strategy to particular circumstances? To what extent should policies or solutions be customised?*

When economic analysts try to determine the business factors that influence a determined results variable (for example, productivity), they normally introduce a series of 'control variables', as they believe that there are a series of factors that greatly influence firm performance and results. The most frequently used variables are firm size, type of ownership, industry in which it operates or even the territory where it is located.

Indeed, in business economics there are two broad trends that attempt to explain the competitiveness of firms. On the one hand, literature on industrial organisation and the paradigm of competitive forces highlights that the profitability of businesses depends to a large degree on the sector in which they operate or compete (McGahan and Porter, 1999; Porter, 1979; Schmalensee, 1985; Waring, 1996). On the other hand, the school of resources and capabilities holds that the main differences in competitiveness and profitability tend to be related to their resources, skills and specific knowledge (Barney, 1991; Brush et al., 1999; Goddard et al., 2009). Regarding the latter two, there are two key business factors: size and ownership of capital, since the analyses show that these are closely linked to the resources, capabilities and specific knowledge of the business and also determine their competitiveness. To these we should add the contributions from the world of development economics, which show that the competitiveness of firms is also conditioned by the territorial environment where they are located.

In other words, productive transformation strategies must adapt to firm size, company ownership, features of the industry or cluster in which they operate and the territory where they are located. This requires knowing, not only the relative weight of firms in different size brackets, their types of ownership, the industries and territories in which they operate, but also their specific behavioural patterns (for example, in terms of R&D), what their intermediate performance is (in aspects such as exports) and what their latest results are (for example, their economic profitability).

How is the Basque Country positioned after eight years of crisis?

Clarifying such questions has been, in a sense, the leitmotiv that has guided the preparation of this *Competitiveness Report*. In addition, we have also sought to elucidate how the Basque Country is positioned with respect to undertaking productive transformation after eight years of crisis. Specifically, with regard to its position, is it foreseeable that the external environment in which Basque firms function continues to be as slow, combined with their continued need of financial adjustments and restructuring, as those presented in the previous *Competitiveness Report*? Or, on the contrary, do the indicators and economic forecasts predict an economic recovery? On the other hand, is there any evidence that, following the financial adjustments and restructuring they have undergone, Basque firms already have profitability and indebtedness to position them to embark on a new phase of investment and growth?

In order to respond to this, in 2014 and 2015 Orkestra and several partner researchers carried out a series of research projects published together with this report in *The*

Basque Country Competitiveness Report 2015 Cuadernos. The key results of these research projects are included in five main sections of the present report. The first section conducts an analysis of the competitive position of the Basque Country and clarifies its current circumstances and situations in order to respond to the questions posed in the previous paragraph. The second section addresses some essential business aspects (size and ownership, as well as specific business strategies like 'hidden champions') associated with company performance and results. The third section discusses variation in company performance and results from one sector and cluster to another. There is also a focus on new concepts and mechanisms for coordinating business activity (global value chains, platforms, etc.) on which analysts, businesses and governments must base their work in order to address the growing complexity of economic activity. The fourth section deals with the territorial heterogeneity in which firms operate, which is related to business activity, not only affecting it but also resulting from it. Lastly, the fifth section reflects on the evolution that is taking place in devising territorial development strategies, the competitiveness programmes and policies initiated by the new members of the Basque Government elected at the end of 2012, and on the general conclusions and recommendations that could be drawn from the analyses contained in the report.

This report presents a summary of the results from *The Basque Country Competitiveness Report 2015 Cuadernos*

Section I.
Competitiveness analysis

The aim of this first section is to offer a general analysis of the competitive position of the Basque Country and how it has performed since the crisis began. It endeavours to provide an answer to the following three questions: *Does the Basque economy still stand out in an international context for its high degree of competitiveness? During the crisis period, did the region perform better or worse than other territories? Given that various types of indicators point to signs of economic recovery, should the Basque economy prioritise the continuation of economic and financial measures or should it lean towards embracing a policy of investment and growth?*

In order to answer these questions, to the extent which there are available data, the Basque Country is compared with a number of regional groupings which are considered relevant: Spanish regions, European regions which share similar structural characteristics and EU regions as a whole. However, as the data for certain key variables are not regionalised or are released with a significant delay, the Basque Country is also compared with a number of other countries or groups of countries. Specifically, along with the traditional comparison with Spain, the EU as a whole and the United States (when data are available for the U.S.), the Basque Country is compared with Germany and the Czech Republic, reference countries which we have attempted to take into consideration throughout every section of this report.

One new aspect of this edition is the comparison of the Basque Country with two reference countries: Germany and the Czech Republic

Germany was chosen because, in addition to being the economy whose weight and dynamism most set the pace for growth in the EU as a whole, it is an advanced economy with significant industrial specialisation and a leader in some of the Basque Country's fundamental areas of focus (especially advanced manufacturing). For the Basque Country, it is therefore a reference economy which certain spheres of the Basque economy strive to match. However, the focus should not be solely on economies which are more advanced than the Basque and to which it aspires. It is also important to focus on less advanced economies which may ultimately catch up with the Basque Country. In this regard, the Czech Republic serves as a reference for two reasons. Firstly, it is among the transition economies which recently joined the EU (and still more recently, the OECD). Furthermore, among these transition economies, it has the highest specialisation in the manufacturing industry (some 25% of its total GVA), as well as higher GDP per capita (€21,900 PPP in 2013).

The three subsections that make up this first section offer different types of analysis. The first subsection follows the general competitiveness analysis framework already used in the 2011 *Competitiveness Report* and which has been replicated since then, providing continuity of analysis. Within this framework, variables or indicators are organised into three groups: those which relate to outcomes or overall goals of competitiveness; those which reflect intermediate outcomes or performance (in other words, they are not of interest in themselves, but rather because success in these areas makes it possible to achieve the overall goals); and those which act as inputs for the competitive process, upon which it is possible to act (to improve intermediate performance and final outcomes). In contrast to previous reports, one new aspect of this first section, in addition to updated data, is the use of a new methodology for identifying regions which share similar structural characteristics

with the Basque Country.[1] Another new feature is the type of regional development strategies that have been developed based on this foundation, taking inspiration from the strategy published recently by Thissen et al. (2013), as well as the analysis of changes in the competitive position of Basque export clusters, which is based on a cluster typology recently developed by Orkestra researchers.

The second subsection, which discusses labour costs and productivity — summarising the more extensive and detailed study prepared by Alberto Alberdi of the Basque Government's Department of Economic Affairs and Planning, which is reproduced in its entirety in *The Basque Country Competitiveness Report 2015 Cuaderno 1* (Orkestra, 2015a) — continues the work on these aspects contained in previous reports. It also supplements the earlier studies, as it incorporates labour costs and productivity into the discussion of functional distribution of income, return on capital and capital productivity, as well as providing estimates for total factor productivity. These are areas on which the aforementioned department has been doing extremely professional work, and in line with Orkestra's philosophy, it is preferable to move forward along the path of collaboration and institutional specialisation, rather than duplicating efforts. Thanks must therefore be extended to Alberto Alberdi and his institution for their contribution to the analysis of such important and essential aspects of any assessment of economic and social competitiveness.

For the first time, the report addresses the economic and financial analysis of Basque firms from a comparative international perspective

Lastly, the third subsection introduces a new aspect, undertaking an economic and financial analysis of Basque firms from a comparative international perspective, based on data from balance sheets and profit and loss statements. In order to do this, it has been necessary to overcome a number of obstacles, owing to problems with sources and data comparability. In addition to the traditional analyses of the makeup of balance sheet accounts and income statements, following on from Salas (2014), this subsection makes a novel distinction between return on the company's financial assets and return on operational assets. Taking a cue from Maudos and Fernández de Guevara (2014), this subsection also provides an in-depth analysis of indebtedness and various corporate risk or vulnerability indicators linked to it.

[1] *The Basque Country Competitiveness Report 2015 Cuaderno 1* (Orkestra, 2015a) includes a comparison of the results of this methodology (which identifies the regions which are potential competitors for the Basque Country) with the list of 'competitor regions' whose products are available on the markets (regional and industry-specific) where the Basque Country operates. This list was compiled based on the recently created ERCS international database, which for the first time provides estimated data on production and trade flows among all European regions (see Thissen et al., 2013). After comparing the results of the two lists and considering the implications deriving from both, it was concluded that for benchmarking exercises, in which competitive performance is assessed or the goal is to learn (policy learning), the list developed by Orkestra is preferable.

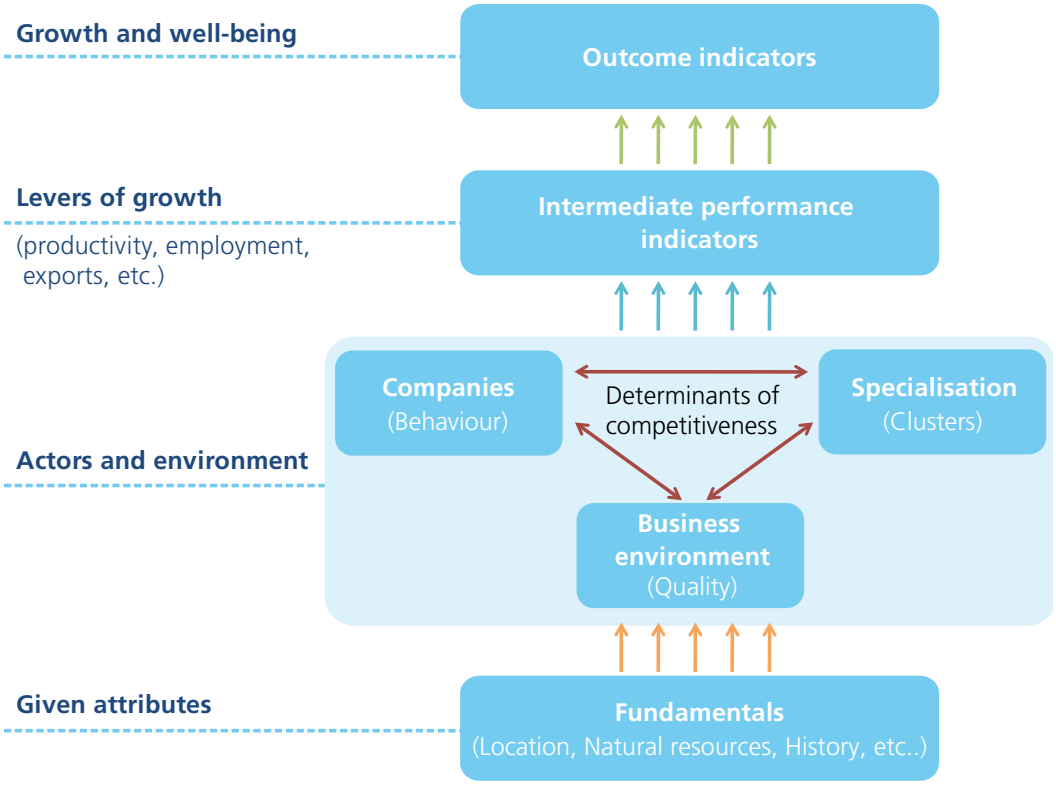
Analysis of competitiveness in the Basque Country

Competitiveness analysis framework

The analysis of the Basque Country is organised into several levels that determine competitive performance

In line with the previous two competitiveness reports, this subsection provides an analysis of the competitive position of the Basque Country. The aim is to analyse changes in this position, using the most recent information available to do so. This analysis uses the same theoretical framework as that utilised in the 2011 and 2013 reports, of which we offer a brief summary here. As Illustration 1 shows, this framework is divided into four levels indicating the different factors which determine the territory's competitive performance. At the top are the outcome indicators, which include the overall goals to be achieved in terms of citizen wellbeing. Below this are the intermediate performance indicators. While these are not the overall aims to be achieved by the region, they are important to reaching them. The third level is made up of the determinants of competitiveness, divided into three groups of indicators (firm performance, specialisation of the territory and clusters, and quality of the business environment). This level is particularly important because it is where policies can have a more obvious impact. And lastly, endowments refers to certain characteristics of the territory which have an impact on competitiveness, but which can be more or less taken as givens, at least in the medium term (location of the territory, natural resources, size of the region, institutions, etc.).

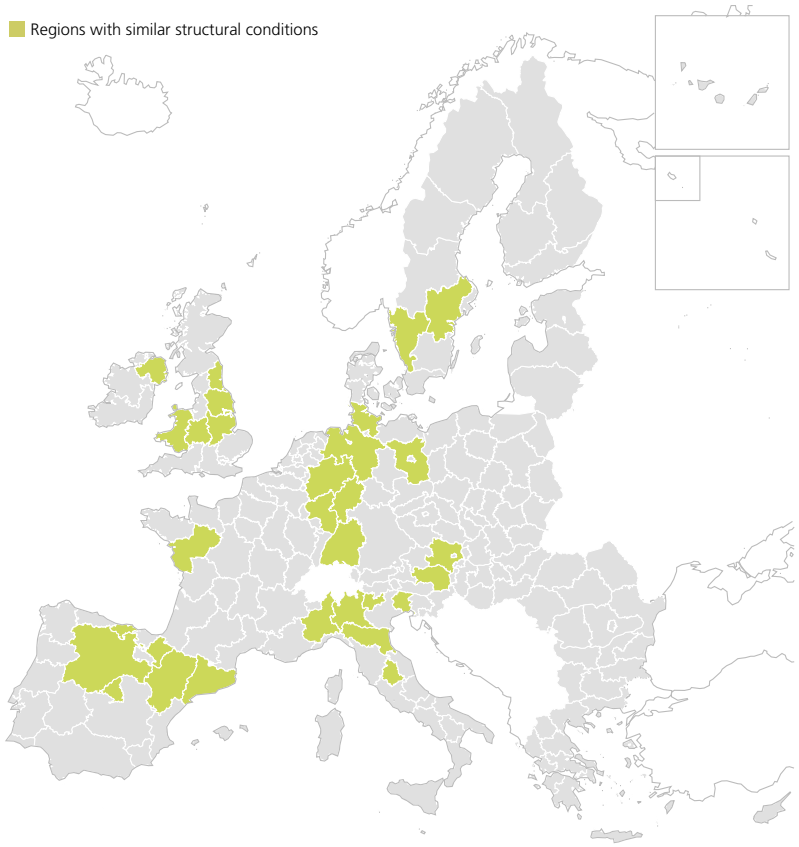
ILLUSTRATION 1 Framework for regional competitiveness



Source: European Cluster Observatory (www.clusterobservatory.eu).

Based on the available data, the situation in the Basque Country is compared with a group of reference European regions, with European regions as a whole (EU) and with the other autonomous communities in Spain. Map 1 shows the top 30 regions (highlighted in green) which have the greatest similarity to the Basque Country in terms of basic structural conditions (socio-demographic, economic and technological specialisation, and business structure), according to the procedure developed by Orkestra in Navarro et al. (2014).

MAP 1 European regions with similar structural conditions to the Basque Country



NUTS	Region	Pos.
ES24	Aragon	1
ITH5	Emilia-Romagna	2
UKG	West Midlands (UK)	3
AT12	Lower Austria	4
DE9	Lower Saxony	5
ITC1	Piamonte	6
DEF	Schleswig-Holstein	7
UKL	Wales	8
ES22	Autonomous Community of Navarre	9
DEA	North Rhine-Westfalia	10
ES51	Catalonia	11
UKF	East Midlands (UK)	12
AT22	Styria	13
DE7	Hesse	14
ES13	Cantabria	15
SE23	West Sweden	16
UKC	North East (UK)	17
ITC4	Lombardy	18
ITH4	Friuli-Venezia Giulia	19
SE12	East Middle Sweden	20
DE4	Brandenburg	21
DE1	Baden-Württemberg	22
ES41	Castile and León	23
DEB	Rhineland-Palatinate	24
UKE	Yorkshire and The Humber	25
FR51	Pays de la Loire	26
ITH2	Autonomous Province of Trento	27
ES30	Community of Madrid	28
UKN	Northern Ireland (UK)	29
ITI2	Umbria	30

Source: Compiled by authors.

Table 1 shows the status of the Basque Country as regards to the different competitiveness indicators. The first columns give the values for these indicators for the most recent year available and for 2008. This makes it possible to see whether the indicator has experienced positive or negative change. The table also shows the position occupied by the Basque Country in comparison with each of the reference groups and whether this position is better (shaded in green) or worse (shaded in red) than two years earlier. This allows us to identify different possible situations, as the Basque Country's position could decline even if the value for the indicator in question improves. This would happen if the other regions made even more significant progress with regard to that indicator (and vice versa).

TABLE 1 Status of the Basque Country in terms of competitiveness indicators

		Values		Ranking in comparison with ...					
				all European regions		reference regions		Spanish autonomous communities	
	Indicator (unit; most recent year)	Most recent	2008	Most recent	Δ	Most recent	Δ	Most recent	Δ
Outcomes	GDP per capita (€ PPP; 2011)	32500	33500	25	–4	4	–1	1	0
	Disposable income per capita (€ PPP; 2011)	19500	20400	18	–13	6	–5	1	0
	Long-term unemployment (% of working pop.; 2014)	9.2	1.5	161	–103	26	–12	4	3
	Risk of poverty rate (% of total pop.; 2013)	10.5	10.4	25	9	4	2	2	0
	Life satisfaction rate (1-10 score; 2012)	6.8	7.4	115	–73	26	–18	16	–9
Intermediate performance	Employment rate (% of 15-64 pop.; 2014)	61.8	67.9	125	–53	27	–7	5	1
	Female employment rate (% of 15-64 fem, pop.; 2014)	58.1	59.2	107	–8	24	0	5	1
	Apparent productivity per employee (€ PPP; 2011)	72	71	20	–1	3	0	1	0
	Exports/Population (€; 2012)	9498.4	9487.8	31	–8	10	–2	2	0
	PCT patents per inhabitant (2008-2011)	58.2	38.5	83	20	22	5	4	0
	Unemployment rate (% of active pop.; 2014)	16.3	6.6	164	–73	26	–8	2	–1
	Youth unemployment rate (% of 15-24 active pop.; 2014)	45.0	19.5	163	–34	25	–1	3	–1
Determinants of competitiveness: Firm performance	Firm R&D personnel (% of employment; 2011)	1.37	1.25	11	2	4	0	1	0
	Firm R&D expenditure (% of GDP; 2011)	1.64	1.64	28	–2	7	0	1	0
	Patent co-invention (% of total patents; 2008-2011)	66	51	84	61	11	15	4	5
	Patents with foreign collaboration (% of total patents; 2008-2011)	4.5	3.4	187	–3	31	0	15	–1
Determinants of competitiveness: Specialisation	Employment in high- and medium-high-tech manufacturing (% of employment; 2013)	7.9	8.6	33	–5	10	–2	2	0
	Employment in knowledge-intensive services (% of employment; 2013)	37.9	31.3	90	31	19	5	3	0
Determinants of competitiveness: Business environment	Human resources in science and technology (% of total pop.; 2012)	16.1	16.5	21	–12	4	–2	2	0
	Population aged 25-64 with upper secondary or tertiary education (%; 2014)	68.4	63.2	145	0	21	–1	2	0
	Tertiary education students (% of 20-24 pop.; 2012)	67.1	54.0	41	25	7	3	6	–3
	Vocational education students (% of 15-19 pop.; 2012)	32.5	26.3	152	12	25	0	4	2
	Population aged 25-64 enrolled in continuing education courses (2014)	11.8	13.6	69	–33	12	–4	1	0
	R&D personnel at public institutions (% of employment; 2011)	0.51	0.39	74	29	16	6	13	2
	Public R&D expenditure (% of GDP; 2011)	0.51	0.39	93	19	20	6	10	5
	Total R&D personnel (% of employment; 2011)	1.88	1.65	18	7	4	2	1	2
	Total R&D expenditure (% of GDP; 2011)	2.15	2.03	41	–2	7	0	1	0
	Households with broadband access (%; 2014)	77	44	80	15	19	1	2	4
	Internet sales (% of total pop.; 2014)	45	23	95	–3	19	1	2	1
	Part-time employment (% of employment; 2014)	17.46	13.4	102	–1	26	–2	4	–3

Source: Eurostat. Eustat. Ameco. European Social Survey. Compiled by authors.

Positive evolution

Negative evolution

Basque competitiveness: final outcomes

At the start of the crisis, the Basque Country was in a very favourable position with regard to all of the outcome indicators taken into consideration. It was in the top 20% of the best positioned regions in each of the groups considered: European regions, reference regions and autonomous communities. It was able to maintain this position during the early years of the crisis with regard to economic performance, GDP per capita and disposable income per capita, although with less favourable growth in the second, especially when compared to the reference regions. However, additional analyses — in which variation in GDP per capita for the Basque Country is compared with a number of countries — demonstrate that, unlike other economies (with the exception of Spain), which soon began to recover, the Basque Country again saw negative growth in 2012 and 2013. It is only in the most recent year available (2014) that we see the numbers improve, although they still do not reach 2008 levels.[2]

The crisis has had an extremely negative effect on the perception of the quality of life and long-term unemployment

In contrast, the situation is not as positive when the social indicators are considered. The Basque Country remains among the top 20% of regions only in poverty rate, even slightly improving its position. The decline is quite marked in the other two indicators (the subjective life satisfaction indicator and long-term unemployment). In the case of long-term unemployment, the drop in comparison with both European regions as a whole and the reference regions occurred between 2008 and 2012, and the Basque Country had not succeeded in regaining its position by 2014. In fact, in 2014, the Basque Country was the only region in which long-term unemployment continued to rise.

Basque competitiveness: intermediate performance

In terms of intermediate performance indicators, the Basque Country's relative position in 2008 was not good compared with European regions as a whole. And it was even worse in comparison with the reference regions. For most indicators, the Basque Country was not among the top 20% of regions, and in some cases, it was even in the bottom 50%. The exceptions were apparent in productivity per employee and exports. The situation looks quite a bit better when the Basque Country is compared with the other autonomous communities. Furthermore, in comparison with these, the trend has been positive. In recent years, the Basque Country has ranked high in almost all of these indicators.

In terms of employment rates (female and total), the latest figures available place the Basque Country below average in the ranking for all regions and even below the reference regions. In the case of total employment, by 2012 it had dropped several positions and lost even more over the following two years. As regards to female employment, it moved up several positions in 2012, but dropped back down in 2014.

For the two indicators in which the Basque Country started in the best positions (apparent productivity per employee and exports), its position has remained relatively stable within Europe as a whole. In comparison to the reference regions,

[2] See *The Basque Country Competitiveness Report Cuaderno 1* (Orkestra, 2015a).

apparent productivity per employee saw a slight improvement in 2009, but dropped again in 2011. In studying the changes in this indicator for the Basque Country, we see that the increase in productivity in 2012 and 2013 was due to the fact that the drop in employment was greater than the decrease in GDP. It was not until 2014 that productivity growth and employment growth became compatible for the first time since the start of the crisis.

In 2014 productivity growth and employment growth became compatible for the first time since the start of the crisis

The number of Basque PCT patents per inhabitant is considerably lower than in the group of reference European regions which have an economic and technological structure similar to the Basque Country. This means that the gap cannot be explained by the Basque Country's specialisation in industries or types of firms which are somewhat unlikely to obtain patents. However, this situation has been improving in recent years. The innovation performance data which can be obtained from the *Regional Innovation Scoreboard 2014* indicate that in 2010, the Basque Country was close to average for European regions in terms of product or process innovation, but much lower in marketing and organisational innovation.

The situation and change in total unemployment rates, especially youth unemployment, are particularly unfavourable. The results for these indicators are consistent with the relative position of the Basque Country in long-term unemployment rate (discussed above as an outcome indicator). They point to relative weaknesses in the Basque economy as regards to creating and maintaining jobs, at least in the context of the current crisis, with human resources which are not being utilised.

Basque competitiveness: determinants

The determinants of competitiveness are the most critical elements of the theoretical framework presented in Illustration 1, as these are the factors which determine the outcomes (final and intermediate) for a territory's competitive performance. Additionally, whereas public policies do not normally have a direct impact on outcome indicators,[3] it is however possible to reinforce the factors which underpin these results.

The theoretical framework identifies three groups of determinants of competitiveness: those associated with firm performance, those associated with the structure of clusters and groupings of related activities in the economy, and those associated with the business environment in general. The aim of this section is to focus the analysis on certain aspects which are particularly significant and for which there are available data which make it possible to draw comparisons among regions and present an overview in order to learn how the Basque Country is positioned in comparison with these other regions:

- With regard to firm performance, the Basque Country's position in terms of firm R&D has not experienced significant change: in 2011, as in 2009 and 2008, the Basque Country remained among the top 20% of regions — both European and

The Basque Country's position in terms of firm R&D has not experienced significant change

[3] Among the outcome indicators considered, disposable income per capita is in fact directly influenced by the effect of valuation and transfers.

Spanish, as well as its reference group — whose firms allocate the most personnel to R&D and spend the most on this item.

- The two patent co-invention indicators show that collaboration on developing inventions primarily takes place with regional or national actors. In contrast, the Basque Country ranks near the bottom in the co-invention with foreign collaboration indicator, although its position has improved considerably.

Employment in high- and medium-high-tech manufacturing and knowledge-intensive services is noteworthy

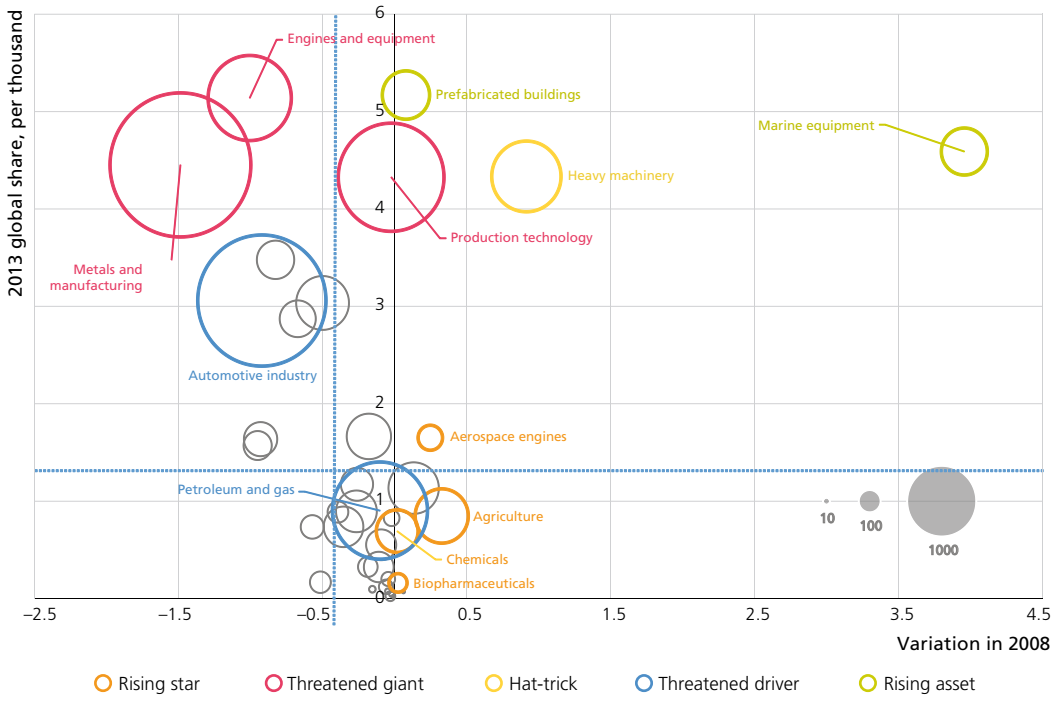
- With regard to the region's economic specialisation, the Basque Country continues to have one of the highest percentages of employment for high- and medium-high-tech manufactured goods in Europe, Spain and the reference group. In addition, its position as regards to knowledge-intensive services has improved significantly: the Basque Country has moved into the middle of the ranking for both European regions as a whole and the reference group, and the top of the ranking for Spanish regions. The improvement in this indicator took place between 2008 and 2011 and held steady over the past two years.
- Regarding the business environment, the Basque Country has held on to its favourable position in human resources in science and technology. However, the percentage of adults with upper secondary or tertiary education is still less than in many other European regions and the reference group. In contrast, the Basque Country is in a good position in terms of continuing education rates, which may help to improve the capabilities of the adult population. We can also see that when compared with the other Spanish autonomous communities, the Basque Country is in a very good position in all of the indicators related to human capital.
- Its position in public R&D personnel and expenditure (which includes government and universities) is worse than private investment in R&D, but has improved in recent years.
- Lastly, rounding off the assessment of the business environment, analyses demonstrate that the Basque Country has undergone a demographic change since 2011. Total population has decreased slightly since that year, while the dependent population (people under 15 and over 65) has grown at the expense of the population aged 15-64. This therefore represents a decline in the working population driven by a negative migration balance in 2013 and a progressively ageing population, among other factors.

There has been a drop in the potential working population due to a negative migration balance and a progressively ageing population

Although three clusters which are significant for the Basque Country will be analysed in depth below, Graph 1, based on export data, gives an idea of the weight of the different Basque export clusters. It shows the Basque Country's relative share of global exports for the corresponding cluster in 2013 (position on the vertical axis), its absolute weight (bubble size), and variation in export share (position on the horizontal axis) over the 2008-2013 period. During this period, the Basque Country saw its market share of global exports drop 0.39 points per thousand.

The analysis of variation in the different clusters utilises a typology developed by an Orkestra team. This system makes it possible to classify the clusters based on their importance (share of Basque exports), based on their competitive position (share of global exports) and based on their dynamism (increase in share of exports). In other words, the larger its bubble in Graph 1, the more important the cluster is; the higher it is on the graph, the more competitive it is; and the more to the right it is

GRAPH 1 Map of export clusters in the Basque Country



Source: Compiled by authors based on AEAT (Inland Revenue) and United Nations Comtrade data.

positioned, the more dynamic it is. The combination of these three categories yields the types included in the typology shown in Table 2.

Based on a typology of regional development strategies proposed by Thissen et al. (2013), using ERCS data, Orkestra has prepared a template which is then applied to the Basque Country, reference regions and European regions (see Graph 2). From this, it is possible to determine that the Basque Country is quite a diversified region and that its degree of openness is clearly lower than the average for European regions, according to ERCS data. Its reference regions (all part of the EU-15) are also diversified regions, with an average degree of openness similar to the Basque Country (and therefore lower than the EU average). Spanish regions have a higher level of specialisation than the Basque Country, and a slightly lower degree of openness. Among the European regions which are not reference regions for the Basque Country or are not Spanish, those in the enlargement countries are characterised by greater specialisation and openness; while those in the EU-15 reflect the opposite.

The Basque Country is a diversified region with a lower degree of openness than the European average, but similar to that of the reference regions

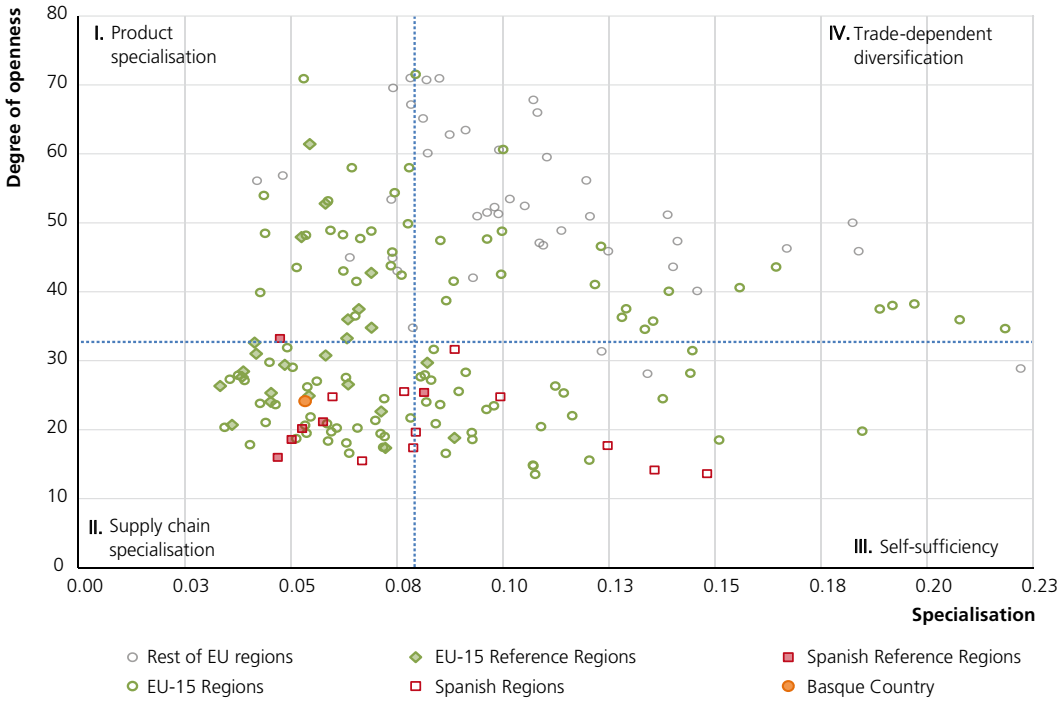
In short, with a relatively high level of diversification and a degree of openness lower than the average for EU regions, we can say that the Basque Country's development strategy resembles that of its reference regions and the large regions in EU-15 countries.

TABLE 2 Cluster typology for the Basque Country

Type	Important	Competitive	Dynamic	Definition	Clusters
Hat-trick	X	X	X	Well positioned in all three indicators, in other words, among the top 10 clusters for each indicator.	Heavy machinery
Threatened giant	X	X		Represents a significant share of the Basque Country's exports while its share of global exports is considerably higher than the other clusters in the Basque Country, but its position may be threatened by the fact that it is not among the most dynamic.	Metals and manufacturing
					Engines and equipment
					Production technology
National driver	X		X	Although its percentage of global exports is not among the largest in the Basque Country, it has a significant share of total exports and its global share is growing.	—
Rising asset		X	X	Although its percentage of the Basque Country's exports is not significant, its share of global exports is considerably higher than the other clusters in the Basque Country and its share is increasing.	Marine equipment
					Prefabricated buildings
Threatened driver	X			Although its percentage of global exports is not among the largest in the Basque Country, its share of total exports is significant. However, this position may be threatened by the fact that it is not among the most dynamic.	Automotive
					Petroleum and gas
Threatened asset		X		Although its percentage of the Basque Country's exports is not significant, its share of global exports is considerably higher than the other clusters in the Basque Country, but its position may be threatened by the fact that it is not among the most dynamic.	—
Rising star			X	Its share of Basque and global exports is not yet significant, but due to its dynamism it is advisable to continue monitoring in upcoming years.	Aerospace engines
					Agriculture
					Biopharmaceuticals
					Chemicals

Source: Compiled by authors based on Aranguren et al. (2015), with data from AEAT (Inland Revenue) and United Nations Comtrade.

GRAPH 2 Development strategies of EU regions



Source: ERCS and European Cluster Observatory. Compiled by authors.

Conclusions

As regards to the final outcome indicators, the crisis has left an especially strong mark on social indicators, measured by the general perception of wellbeing and the long-term unemployment indicator, which continues to decline. In terms of economic aspects, GDP per capita was affected similarly to European regions as a whole at the start of the crisis, meaning that the situation did not change in relative terms. However, in more recent years, the more developed economies (and even the Czech Republic) have started to experience a recovery, whereas this took longer to get underway in the Basque Country. We see signs of it only in 2014, the last year for which there are data available.

In the intermediate performance indicators, the Basque Country's relative position remains quite weak when compared with other European regions, particular the reference regions. While it is true that the Basque Country is in a favourable position in terms of productivity, in which it started at a good level, this is also due to significant job losses between 2009 and 2013, which led to passive productivity increases. It was only last year that the rise in productivity was accompanied by slight growth in job creation. However, this has not translated into a drop in the unemployment rate, due to the even greater increase in the size of the working population. Creating jobs is therefore among the greatest challenges facing the Basque Country.

One of the Basque Country's greatest challenges is job creation

Concerning exports, following a considerable decline in 2009, they began to recover, but at a slower pace than in other areas. The development strategies typology presented above shows that the Basque Country, although quite diversified, has a

lower degree of openness than the average for European regions, but similar to that of the reference regions.

As regards to determinants of competitiveness, it seems essential to continue with efforts to increase the efficiency of the innovation system. Thus, high levels of R&D investment have not translated into a high percentage of innovative firms or into good patent performance. It would also be advisable to spur cooperation and connection between the Basque innovation system and foreign actors.

The Basque Country also maintains a good position in terms of employment in high- and medium-high-tech manufactured goods, although it has declined in recent years. In contrast, it is improving in knowledge-intensive services. In addition, although there has been a drop in share of global exports, certain export clusters have performed especially well (for example, heavy machinery, biopharmaceuticals and chemicals). However, performance in other areas is a cause for greater concern, as they have lost market share and represent a larger proportion of exports (the metals, manufacturing and automotive clusters, for example). Therefore, it would be advisable to assist the former in continuing to grow and support the latter in regaining their market share.

The heavy machinery, biopharmaceuticals and chemicals clusters have had very positive export performance

For its part, job creation will depend on having a properly trained and educated population. The indicators analysed show that the Basque Country is well positioned in terms of number of tertiary education students, but not as much so as regards to number of vocational education students.

Lastly, mention must be made of the demographic changes currently taking place (decrease in working-age population, ageing population, as well as a certain increase in the population under the age of 15, which seems to have slowed in the last two years), as these have implications for the job market, education planning and new market opportunities. Another key aspect of demographic change is migration flows, which have been negative since 2013.

Labour costs, profitability and productivity

Why they are important for productive transformation

If competitiveness is the ability to maintain high levels of income and increase it through openness to international trade, there can be no doubt that productivity is the indicator which offers the best measure of competitiveness. In fact, the economy's growth rate represents the sum of increases in both productivity and employment levels. Consequently, there are two sources of growth: one is extensive, resulting from a rise in the population in work; and the other is due to the increased efficiency with which this labour force works. In the long term, it can be assumed that modernisation of job markets, such as that which took place in the Basque economy during the most recent growth cycle, will tend to shrink the employment-to-population ratio, meaning that growth in income per inhabitant will be dependent on advances in productivity.

If labour productivity, or even better, total factor productivity (TFP) — which seeks to measure the efficiency of the production process based on the contribution of all factors of production — is the true indicator of competitiveness, why is there so much emphasis on labour costs?

Labour costs affect firm competitiveness and profitability

In addition to representing one of the main sources of income for a country's inhabitants, labour costs are important because they affect the competitiveness of firms and their profitability (and through this, future financial accumulation). In fact, ceteris paribus, a rise in labour costs will lead to either an increase in product prices (which will reduce their competitiveness), or lower profit margins and a reduction in profitability (and as a result, a downturn in business investment and less capital accumulation).

In order to analyse the effects of labour costs on business competitiveness, on profitability and ultimately, on capital accumulation, it is advisable to distinguish between three basic labour cost indicators: nominal labour cost (NLC), nominal unit labour cost (NULC) and real unit labour cost (RULC).

Nominal labour cost (per employee or per hour worked) (NLC) gives a preliminary idea of the competitive advantage or disadvantage of a country's firms as a result of the cost of labour. However, NLC only takes into account how much the worker or the hour worked costs, not how productive the former is. If workers are more productive, higher labour costs will be divided amongst a larger number of units, meaning that the labour cost for each unit will depend on both NLC and productivity. The variable which takes both NLC and productivity into account is nominal unit labour cost (NULC). If this increases, but other costs (energy, financing, etc.) do not change and the firm wishes to maintain the same margin, it will need to increase the price of the product. This will reduce the firm's competitiveness (if competitors maintain the same prices). Therefore, the most important labour cost indicator for analysing business competitiveness is NULC.

What ultimately happens to business profitability when NLC increases (again assuming that other costs do not change) will depend on what is done with product prices: if the firm increases prices on a par with NLC, or more, profitability will not

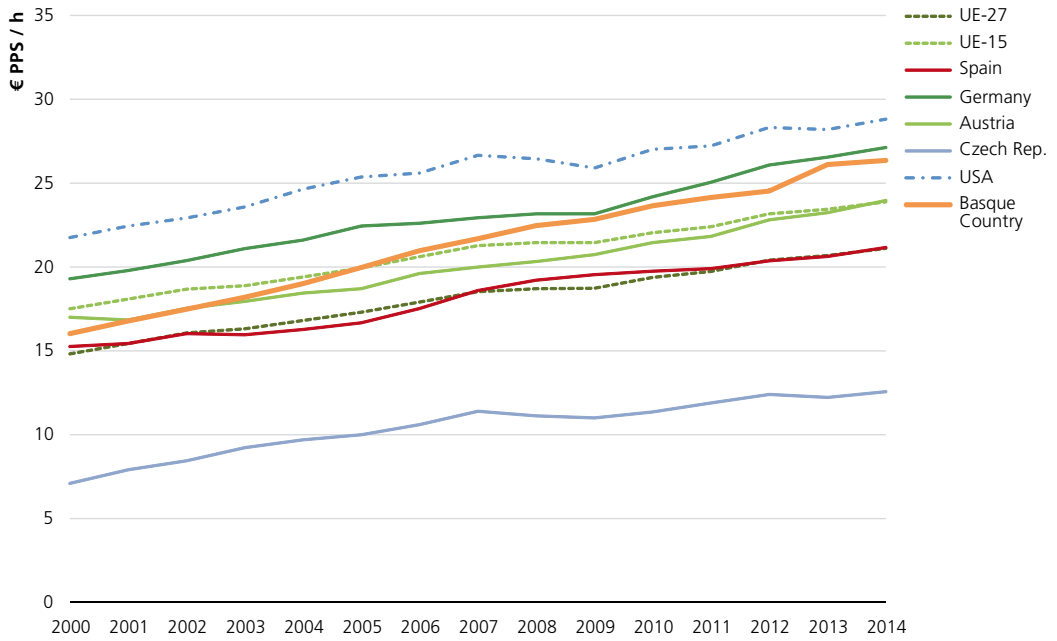
be negatively affected, or may even increase. Therefore, in order to analyse what happens to business profitability, it is necessary to take NLC, prices and productivity all into account. The labour cost indicator which makes it possible to consider these three elements together is real unit labour cost (RULC). This leads us to conclude that RULC is the most suitable labour cost indicator for analysing the impact of labour costs on profitability.

The situation in the Basque Country

Labour costs

At the present time, U.S. nominal labour costs (NLC) per hour worked are approximately 10% higher than in Germany. The position of the Basque economy is very close to that of the latter country, whereas the EU-27 and Spain are more than 20% lower. Special mention should be made of the Czech Republic, as a benchmark for the economies of the eastern enlargement. Despite strong growth, there is still a significant differential with the European core and therefore, the Basque economy.

GRAPH 3 Nominal unit labour cost per hour worked (2000-2014)



Source: Ameco, Eustat. Compiled by authors.

Note: Ratio of nominal cost to real productivity in purchasing power parity terms.

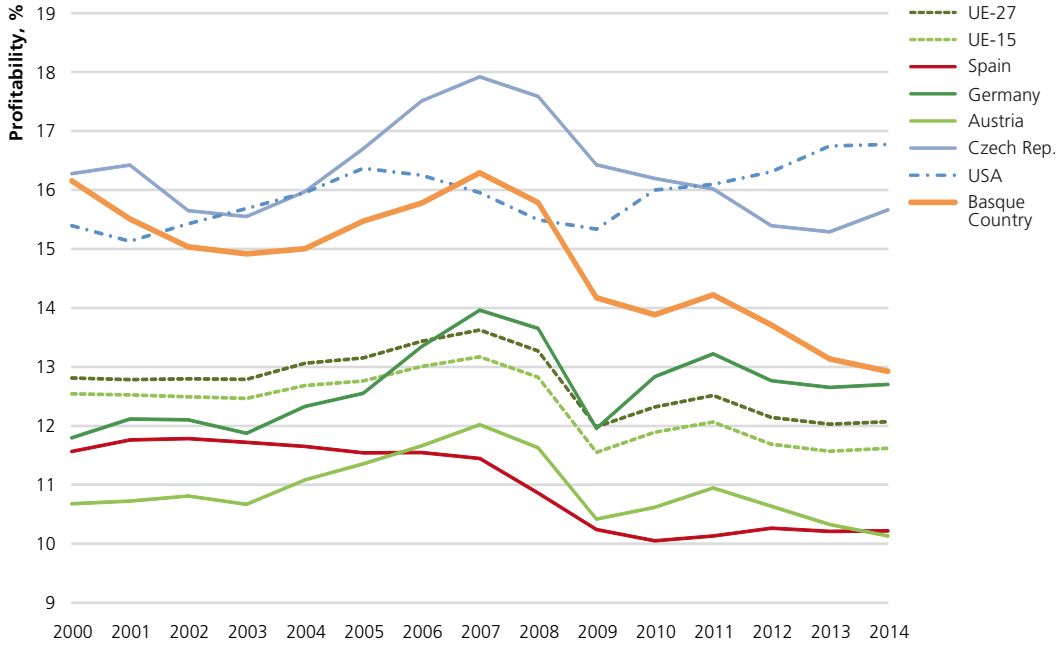
If we turn from analysis of NLC to NULC, we see that before the crisis, NULC was increasing more and with greater strength in Spain than in the EU, and even more so in the Basque Country. Additionally, when the current economic and financial crisis began, Spain experienced a dramatic downturn, with a sharp drop in NULC (see Graph 3). In contrast, the Basque economy saw very little change, meaning that the narrowing of the gap between the Basque Country and the other countries used for comparison was smaller than in Spain.

Lastly, analysis of RULC shows that during the growth phase, these costs fluctuated in the Basque Country, but without distancing themselves from economies like Germany. Basque RULC is also similar to the level for the German economy, which is lower than that of the other European reference economies, leaving out much less developed countries such as the Czech Republic. Following the crisis, the Basque economy also seems to have kept RULC down, although it appears that there has been an upturn in the last two years (for which the data are still provisional). In short, wage and price formation mechanisms operating in the Basque Country produce a steady rise in NLC and as a result of this, in NULC. This is detrimental to the competitiveness of Basque firms, especially within the same monetary union. However, this behaviour by nominal labour costs does not necessarily translate into a change in functional distribution of income, as demonstrated by the relative stability of RULC.

Return on capital

Variation in return on capital is dependent on variation in RULC and capital productivity (understood as the inverse of the capital/product ratio).

GRAPH 4 Gross return on capital (2000-2014)



Source: Ameco, Eustat. IVIE-BBVA Foundation. Compiled by authors.

Note: Ratio of gross surplus to stock of capital in purchasing power parity terms.

Gross return on capital is on the rise, although this trend was interrupted by the 2008 economic and financial crisis in most countries. The Basque economy was among those that experienced the greatest decline after 2007. However, as it started from a level on a par with the United States, it has now converged with Germany.

Return on capital remains high in the Basque Country, despite a significant drop during the crisis

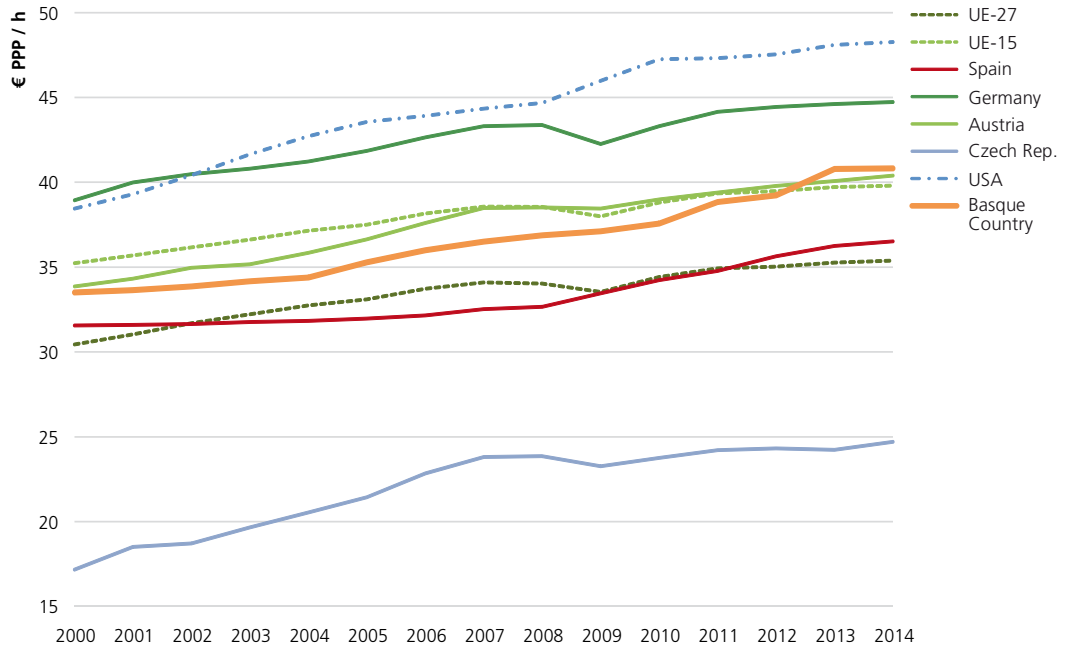
Productivity

To get a preliminary idea of productivity levels, which is the indicator that best summarises a territory's competitiveness, it is possible to look at hourly labour

productivity. However, a more comprehensive approach is provided by what is known as 'total factor productivity'.

The hourly productivity gap between the United States and the EU-15 when the euro was introduced has only grown wider since that time, especially during the seven years of the economic and financial crisis.

GRAPH 5 Productivity per hour worked (2000-2014)



Source: Ameco, Eustat. Compiled by authors.

Note: Thousand euros in purchasing power parity terms.

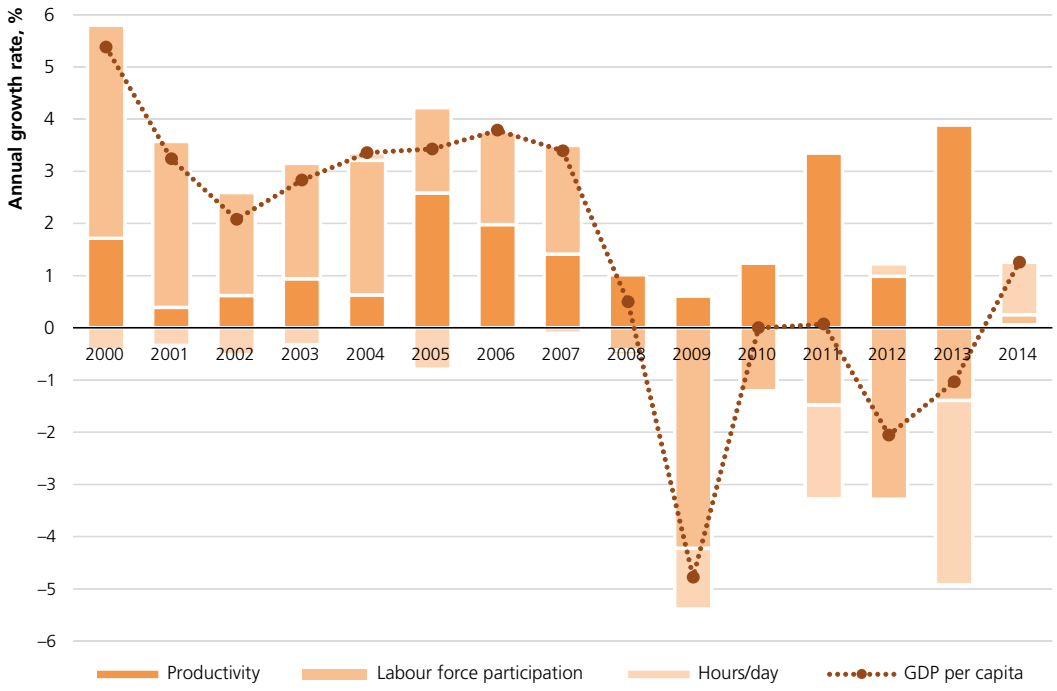
Basque productivity exceeds that of the EU-15

The EU-15 is clearly an obvious benchmark for an economy such as the Basque Country's. Although Basque productivity growth was weaker at the start of the new century, it was soon on the path to convergence, which would become reality in 2011. Since then, it has surpassed the EU-15, as well as economies such as that of Austria, which bears some similarities to the Basque Country in the profile of several of its main regions.

The Spanish economy reported very low productivity numbers between 2000 and 2008. However, during the crisis, like the Basque economy, Spain recovered considerably in this area, even reaching and surpassing its natural benchmark: the EU-27.

The performance of hourly productivity is highly dependent on the types of labour-related measures implemented by the different economies, particularly during the crisis and while emerging from it. Graph 6 analyses the model followed in the Basque Country, breaking GDP growth per capita down into three components: hourly productivity, number of hours in the working day and labour force participation (the last indicates the number of people in work, out of the total population).

GRAPH 6 Breakdown of GDP growth per capita in the Basque Country, in purchasing power parity terms (2000-2014)



Source: Ameco, Eustat. Compiled by authors.

In the Basque Country, weak productivity growth during the early years of the century coincided with a massive influx of people into the labour market, which continued to remain compatible with productivity gains until 2008. With the recession, measures were taken which focused more on people than on the working day, with small productivity gains.[4] These followed a model which could be considered midway between Spain's heavy job losses and considerable changes in the working day in Germany, based on its well-known short-time system *(Kurzarbeit).* Productivity gains later became more significant again, but in the context of heavy job losses, although improvements in efficiency are associated more with reducing the working day than the loss of people in work. 2014 finally brought the first rise in GDP per capita after five negative years, with an increase in the labour force based more on hours than on number of jobs and sluggish productivity. Slow productivity growth during this second emergence from the recession seems to also be a common feature in Germany and the EU-15 as a whole. Only in Spain is it somewhat higher.

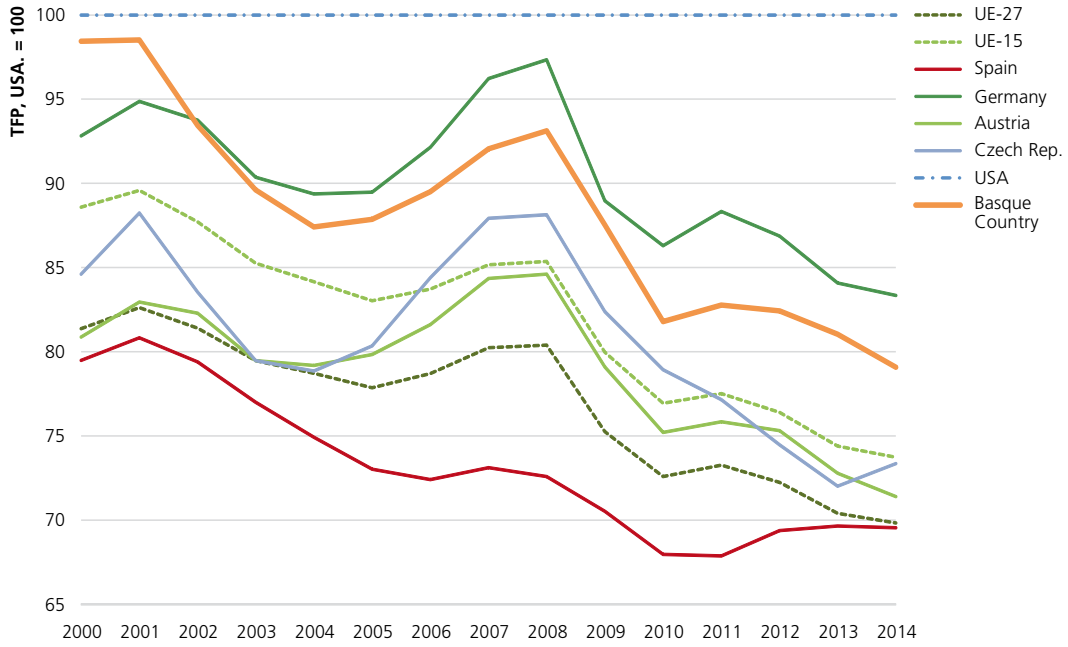
2014 finally brought the first rise in GDP per capita after five negative years

Total factor productivity (TFP) is another matter, as during the expansion period, TFP growth was relatively low in overall comparison with the surrounding economies.

Despite everything, TFP levels for the Basque economy are relatively high. In fact, during the last growth phase of the cycle, both the Basque Country and Germany had very similar levels in the United States. However, the difference in the impact of the crisis between Europe and the United States represented a very large relative setback for both of the European economies and for the EU as a whole, which

[4] It should be remembered that the analysis is based on hour worked and that if it instead used people in work, productivity would have performed negatively during the recession.

GRAPH 7 Total factor productivity (2000-2014)



Source: Ameco, Eustat. Compiled by authors.

dropped an estimated 10% against the U.S. level. One exception to this is Spain, where the loss was cut in half by means of harsh measures that involved not only job losses — which boosted labour productivity — but also limiting the fall in capital productivity.

Productivity and return on capital levels in the Basque economy are relatively high

Lastly, it should be noted that productivity and return on capital levels in the Basque economy are relatively high, despite having suffered greatly due to their connection to the Spanish market, which experienced a much more serious collapse than Europe during the crisis. The relative strength of the Basque economy is reflected in international comparisons and is undoubtedly related to its industrial sector. However, even so, the Basque economy also demonstrated a certain degree of vulnerability to the model based on accumulation of property and growing indebtedness. Furthermore, during the crisis, the measures that were taken retained some public investments in physical infrastructure, tax deductions on private pensions and some transfers and running costs that were truly unjustifiable in social terms. On the other hand, there were serious adjustments in expenditure on technology capital, education and training, and research (although in all cases, this was notably less than in Spain as a whole).

Conclusions and policy recommendations

In the Basque Country, institutional mechanisms affecting price and wage formation have been a problem, as they have led to higher prices and costs, considerably reducing the competitiveness of Basque firms without this being offset by significant changes in functional distribution of income.

Labour market reforms are among the levers which can potentially be used to modify these price and wage formation mechanisms. The reforms implemented

during the crisis produced considerable cost and price restraint by reducing the negotiating power of workers. However, they were accompanied by a sharp rise in inequality. It would therefore have been preferable to focus on establishing mechanisms of cooperation linked to shared results, rather than limiting measures to simply trying to keep wages down.

Labour market reforms were accompanied by a sharp rise in inequality

Lastly, it should be noted that it is not only capital accumulation which is important, but also the model or type of accumulation. In this regard, the Basque case has some unique features in comparison with Spain. These include those linked to the type of activities in which investments were made. Among other things, this is reflected in the higher levels of productivity and profitability still found in the Basque Country, despite poor progress during the crisis. But despite these positive unique features, the Basque economy has also demonstrated a certain degree of vulnerability to the model based on accumulation of property and growing indebtedness, as well as having been seriously affected by the major collapse of the Spanish domestic market, with which it has close ties.

Public policies should have promoted accumulation models based on the real economy and knowledge, channelling resources and public aid into technology capital, research and education, rather than into physical capital, private pensions or expenditure which, while seemingly tied to social welfare, does not in fact have clear goals in terms of efficiency or protecting people in need.

Comparative economic and financial analysis of Basque firms

Why it is important for productive transformation

The current crisis can be described as essentially financial in nature. It is therefore crucial to understand the economic and financial situation of Basque firms. This would make it possible to accurately assess to what extent they are in a position to invest and take advantage of the signs of recovery that are beginning to make themselves felt in various economic indicators, or clarify whether they should instead continue to implement measures to return to profitability, reducing debt levels and limiting investment. It is possible that a large part of the greater capacity to resist the crisis demonstrated by the Basque productive system is due to the relative economic and financial strength of Basque firms at the start of the crisis. But new studies have not yet been published in the Basque Country which shed light on this important area. Following so many years of crisis, have the comparatively favourable conditions which Basque firms enjoyed at the beginning of the recession disappeared or are they still to be found, although with other features or a different level of intensity?

The Basque Country had an economically and financially strong productive system before the crisis

TABLE 3 Summary of economic and financial indicators for Basque firms

	Indicator (unit)	2008	2013
Balance sheet	Financial assets (% total assets)	53.5	58.1
	Shareholders' equity (% total liabilities)	39.1	52.4
	Reserves (% total liabilities)	1.9	1.4
	Financial debt (% total liabilities)	43.6	34.2
	Commercial debt (% total liabilities)	15.1	11.8
Profit and loss statement	Operating income (% business turnover)	104.0	103.3
	Intermediate consumption (% business turnover)	79.9	80.7
	Personnel expenses (% business turnover)	13.4	13.6
	EBIT (% business turnover)	7.9	6.4
	Financial income (% business turnover)	1.1	1.1
	Financing costs (% business turnover)	5.60	4.50
	Taxes (% business turnover)	0.0	–0.3
	Net income (% business turnover)	5.6	4.0
Profitability	Profit margin (%)	7.9	6.4
	Asset turnover (%)	0.5	0.5
	Total ROA (%)	4.3	3.4
	Operating ROA (%)	9.2	8.2
	Return on financial assets (%)	1.2	1.1
	ROE (%)	7.8	4.1
Indebtedness	Debt-to-assets (%)	60.9	47.6
	Debt-to-GVA (%)	441.9	397.7
	Interest-bearing debt/EBIT (years)	10.1	10.0
	Financing costs/(EBIT + financial income)	0.63	0.60
	Cost of debt (%)	4.3	3.8
	ROA (%)	4.3	3.4

Source: SABI-Informa and BACH project. Compiled by authors.

Basque Country in a **better** position compared to the EU-10

Basque Country in a **similar** position compared to the EU-10

Basque Country in a **worse** position compared to the EU-10

The situation in the Basque Country

Table 3 provides a summary of the main economic and financial indicators for Basque firms in comparison with the EU-10.

Balance sheet analysis

In 2013, the relative weight of financial assets compared to the total assets of firms in the Basque Country clearly exceeded that of Spain as a whole (58% compared to 44%). Among other things, these financial assets include shares in other firms and intercompany financial flows (frequently international) not linked to business operations. Consequently, in the Basque Country, financial assets exceed all other assets (58% compared to 42%). The relative weight of financial assets continued to increase in the Basque Country during the crisis.

On the liabilities side, one significant aspect is the greater weight of shareholders' equity (or owners' equity) in Spanish firms — even more so in the Basque Country — in comparison with Europe. This can be viewed as positive, given that, in addition to making greater solvency possible, in times of crisis, it allows the company to reduce the impact of negative financial leverage and makes it possible to implement strategies such as internationalisation, corporate acquisition or the development of intangible assets, all of which must be undertaken primarily with owners' equity.

In addition, shareholders' equity reported a positive evolution during the crisis in both Spain and the EU (although to a lesser extent in the latter). The numbers for Basque firms follow the same trend, although more accentuated: they started out with higher levels of shareholders' equity than the average for Spain, which then increased to a greater extent in the Basque Country than in Spain as a whole between 2008 and 2013, exceeding 50% of liabilities in 2013.

What is more, in 2013, Spanish firms had a much smaller proportion of reserves than in the EU. In the Basque Country, the level is even lower than in Spain as a whole. This is a reflection of regulatory differences between the various countries (for example, as regards to workers' pensions), different corporate structures (for example, large firms have more reserves than small ones) and the range of cultures relating to risk and provision.

Regarding debt, the analyses give rise to significant conclusions. One is that the Basque Country has a lower level of financial debt than the EU. This is the result of a positive change during the crisis period, as firms in the Basque Country and Spain had higher levels than the EU in 2008. In the case of Spain, levels are currently above those of the EU. In addition, during the crisis, there was a drop in credit financing and an increase in other types of financial debt (most noteworthy, debt to other companies, generally within the same business group, for non-commercial purposes). Lastly, it should be noted that the percentage of commercial debt is lower in Spain than in the EU (and even lower in the Basque Country), continuing the downward trend that begun before the crisis.

The Basque Country has a lower level of financial and commercial debt than the EU

Profit and loss statement analysis

Turning to indicators related to profit and loss statements, analyses show a similar proportion of operating income (which includes a range of accounting entries added to business turnover) for firms in the EU, Spain and the Basque Country.

The analyses also indicate that intermediate consumption represents a greater proportion of the firm's total costs (a little over 80%, on average, in the EU) than personnel expenses (with the EU average being below 15%). This high proportion of intermediate consumption is an indication of the importance of foreign supplies to the company's results, both from a strict cost perspective and because of the knowledge that may be incorporated into products and flows of knowledge through the relationship with suppliers. Obviously, a policy of international supply is generally more effective for supply at a lower cost, while in theory, cluster policies seem to be more suited to supply which allows for greater interaction and flows of knowledge. In contrast, the fact that personnel expenses only represent 15% of total business turnover reveals the limitations of competitiveness policies based solely on restricting — and even reducing — labour costs.

EBIT, as a percentage of business turnover, is higher in the Basque Country than in the other territories. In 2013, this percentage was lower in Spain than in the EU, in which economies such as Germany and the Czech Republic ranked above average.

As regards to financial income, the Basque Country has higher values than Spain. Both are also higher than the EU average, which is consistent with the somewhat greater weight which financial assets also have in the balance sheets of Spanish and Basque firms.

Lastly, taxes as a proportion of business turnover are lower in Spain and the Basque Country than the EU average. Between 2009 and 2012, Spanish firms underwent a much more severe crisis than that generally experienced in Europe. This is reflected negatively in net income and might have resulted in tax deductions in later years such as the present. However, this did not occur in 2008, from which we can deduce that effective fiscal pressure on corporate earnings is lower in Spain than on average in the EU. And this fact seems even more clear in firms in the Basque Country, which, having obtained net income several times higher than that of Spanish firms in both 2008 and 2013, nonetheless reported lower taxes on profits than Spanish companies (in fact, they were negative in 2013).

Profitability and corporate indebtedness

Basque firms continue to report higher profit margins than in other territories

Analyses of the profitability of Basque firms show that in 2013 they had higher profit margins than companies in the other territories used for comparison, although they were somewhat lower than in 2008.

Basque firms also have lower asset turnover ratios (or total sales revenue per euro in assets) than Spanish firms, which in turn have lower levels than firms in the EU-10, Germany and the Czech Republic, a weakness which was already evident before the crisis.

However, the Basque Country is in a favourable position (2.2 times higher than Spain and, if we accept the indirect system of comparison used thus far as valid, also higher than the EU) as regards to operating ROA. This is understood as the return on assets linked to the firm's non-financial operations and is considered to be the indicator which best measures expected return on capital for productive investment in the territory.

However, the position of Basque firms in terms of return on financial assets is unfavourable in comparison with all other territories. If return on financial assets figures truly reflected the profitability of these financial investments and were so much lower than operating ROA, the reduction of the Spanish business community's debt levels, still required by some international organisations would undoubtedly need to involve repaying this debt not with resources generated in Spain, but with the sale of unprofitable strategic assets abroad (Salas, 2014).

When we look at return on equity or ROE, we find that the Basque Country's rate is almost double that of Spain. In fact, based on the data obtained, it can be deduced that the Basque Country's ROE is in a favourable position with regard to the EU average, although it is below Germany and the Czech Republic. We also find that in 2013, ROE in Basque firms was still lower than 2008 levels, while in Germany and the Czech Republic, companies had managed to turn the situation around, achieving higher levels of return on equity than at the start of the crisis. In the Basque Country, the percentage of firms with negative ROE in 2013 was 34.5%, while in Spain it was 32.6%. In both cases, this is an indication that approximately one third of companies are in a vulnerable position. In 2008, the year in which corporate income statements had already begun to reflect the change of cycle (although results were still positive), these percentages were 25.7% and 25.1%, respectively.

One third of Basque firms are in a vulnerable position

For their part, analyses of indebtedness indicate that the 2013 debt-to-assets ratio (reflecting the debt level) in the Basque Country was lower than Spain as a whole and that the latter had a lower percentage (58.3%) than the European average (62.1%).

Similarly, Basque firms have a demonstrably lower debt level than Spain as a whole in terms of debt-to-GVA ratio. According to this indicator, Spain's relative position is not so positive, as Spain (376) has a higher ratio than the EU, Germany and the Czech Republic (347, 358 and 252, respectively). From the data obtained, it seems that the Basque Country's debt level is not higher than in the EU and Germany, although it is above the Czech Republic. It is worth noting that in contrast to the sluggish recovery of this indicator in other territories since 2008, in the Basque Country there has been a definite reduction in debt.

Additionally, the Basque Country is in a better position in terms of debt repayment capacity. In fact, it will need half as many years as Spain to repay its debt. Furthermore, unlike what happened in Spain, and to a lesser extent in the other EU countries as well, this repayment capacity did not increase between 2008 and 2013. In Spain, on the other hand, the situation is two times worse than the European average. This confirms the opinion shared by most analysts: for Spanish firms, the debt problem does not lie so much in the level of debt, but rather in the fact that the return on these funds which firms achieve is clearly insufficient, or at the least,

The Basque Country is in a favourable position and making good progress in its debt level and debt repayment capacity

quite a bit lower than that achieved by firms in other European countries. This weakness was also aggravated by the crisis.

Another point worth noting is that Basque firms are better positioned in comparison with Spanish companies in terms of ROA (among the indicators which, together with the ratio of financial burden to EBIT and the average cost of debt, can be used to determine a risk or vulnerability threshold for the debt). However, it does not appear that this superior position has allowed it to achieve the ROA found in EU-10 firms.

Likewise, Basque firms are in a favourable position compared to companies in the EU with regard to the ratio of financial burden to EBIT. Unlike what occurred with Spanish firms, in the Basque Country, the value of this ratio did not get worse between 2008 and 2013, even achieving a slight decrease.

However, the apparent cost of debt is slightly higher for Basque firms than Spanish firms. The level for the latter is in turn lower than most other EU countries.[5] Despite the decrease in the apparent cost of debt in recent years, in 2013 it was higher than ROA in both the Basque Country and Spain. Consequently, Spanish and Basque firms have negative financial leverage. The situation is more balanced in the EU-10. In Germany and especially the Czech Republic, ROA is even higher than apparent cost of debt. Therefore, whereas Spain, and to a lesser extent, the Basque Country, had positive financial leverage in 2008, and the EU-10 as a whole and Germany had negative financial leverage, the opposite was true in 2013.

Lastly, on a negative note, it should be stressed that a large percentage of Basque (60%) and Spanish firms have at least one of the three risk indicators: almost one third of firm have risk indicator 1 (negative ROA); a somewhat higher percentage of firms are unable to meet their financial burden (payment of interest and other financing costs) with the revenue they obtain, either from EBIT or financial investments (risk indicator 2); and ROA is lower than the apparent cost of debt capital at 50% of Basque and Spanish firms, meaning that these companies have negative financial leverage.

Conclusions and recommendations for the future

Basque firms are in a favourable position to take advantage of growth and investment policies

As a whole, Basque firms are in a relatively favourable position to take advantage of the positive prospects signalled by economic indicators through growth and investment policies relating to key aspects of competitiveness (innovation and intangible assets, internationalisation and firm size). It is possible to say this because they have relatively low debt levels and acceptable rates of return (especially for assets more closely linked to production activity within the country).

But the picture obtained from the aggregate data on all firms conceals extremely disparate realities. For example, the analysis makes it possible to discern the drop in ROE for firms as a whole (quite acceptable in general) as well as the net income

[5] As Maudos and Fernández de Guevara (2014) point out, the cost of existing debt may be different from that of new debt. According to the most recent edition (September 2014) of the Survey on the Access to Finance of Enterprises (SAFE) prepared by the European Central Bank, the median interest rate applied by banks to the most recent loans received was 5.5% in Spain (compared to 5% in the EU-28, 6% in Germany and 3.2% in the Czech Republic).

for individual firms (with more than one third of all Basque firms sustaining losses in 2013). It is therefore necessary to supplement future aggregate economic and financial analyses with other more detailed studies, using different indicators which allow us to gain a better idea of the distribution of companies within the aggregate as a whole. What is more, databases and analytical tools will need to be developed which make individual information and assessments regarding the capabilities and risks of each firm available to the government. This would allow them to be classified according to the different aims of each policy tool, making it possible to manage them more effectively and efficiently.

Section II.
Business-related factors: size, ownership and hidden champions

A great deal of the literature which attempts to explain business competitiveness — and thus the ongoing productive transformation which makes it possible — maintains that this competitiveness is primarily determined by the specific resources, capabilities and knowledge of firms. However, a number of empirical analyses have demonstrated that these dynamic business resources and capabilities are related to two important factors: the firm's size and ownership of its capital. The aim of this section is therefore to offer an in-depth discussion of what we know about the makeup of these two factors in Basque firms in order to see how they may affect the resources and capabilities required to engage in productive transformation.

Size and ownership of capital are factors which have an impact on business competitiveness

However, there are always exceptions to the rule and certain business practices may not strictly be determined by size- or ownership-based logic. This is the case with a phenomenon to which analysts are beginning to pay increasing attention: firms known as 'hidden champions'. In the Basque Country, this phenomenon has attracted the attention of certain analysts and political leaders, although more with the aim of making an inventory of these firms than as a result of methodical research or study.

This section therefore seeks to shed light on the different resources and capabilities of Basque firms determined by their size and ownership of their capital which allow them to be competitive and move forward with productive transformation. It also undertakes a preliminary exploratory study of hidden champions (or as they are more accurately called, international niche market leaders) in the Basque economy.

In the case of firm size, it is surprising that, despite the great importance which analysts, firms and political leaders give to this factor, to date there has been no international comparative study which makes it possible to confirm or refute the frequent claim that firms in the Basque Country are smaller in size than in other areas. This opinion is usually accompanied by another which associates this lack of size with competitive disadvantages (especially with regard to internationalisation and R&D), again without providing definitive data to corroborate the assertion, beyond references to isolated cases. In order to tackle these issues, the subsection on size begins with an overview that lays out the main conclusions found in international analyses regarding the relationship between firm size, performance and results. This is followed by a preliminary international comparison of the size of Basque firms carried out using uniform criteria, in other words, not comparing data for different units (enterprises for the Basque Country and firms for other countries). It also takes into account jobs created by Basque firms not only in the Basque Country, but also throughout Spain. We then move on to an analysis of the competitive position of the different size brackets of Basque firms (in other words, small, medium and large), not only in comparison with each other, but also compared to equivalent size brackets in other regions.

This makes it possible to respond to two questions implicit in the widely-held opinions discussed earlier, namely: *Are Basque firms smaller than in other areas?* and *What are the competitive disadvantages resulting from this smaller size which may hinder productive transformation?* This analysis also allows us to answer another question that was often heard during the intense crisis which battered the Basque and Spanish economies: *Did large firms cope better during the crisis?*

Similar questions emerge with regard to the presence of firms with foreign capital in the Basque Country. The third Orkestra *Competitiveness Report* (2011) explored the relatively inbred nature of the Basque economy, which is reflected more in inflows than outflows (of capital, for example). Various analysts have stated that, considering the existing financial restrictions, one of the main mechanisms for growing the economy and tackling unemployment problems created by the crisis is foreign direct investment. For this reason, it seemed important to study to what extent foreign capital is an established part of the Basque economy, how this presence has changed over time and the performance and competitive results typically reported by firms with foreign capital.

One other group of companies characterised by their unique form of ownership are cooperatives, which the Basque economy has in greater numbers than in other areas. According to Eustat (Basque Statistics Office) data, 5.9% of people employed in one of the activities included in the Basque Directory of Economic Activities (Dirae) work for a cooperative. This percentage is 10.9% in industry. In territories such as Gipuzkoa, these percentages reach 11.4% and 18.7%, respectively. Events like the Fagor Electrodomésticos crisis have led to public debate on the pros and cons of the cooperative model. They have also made clear that there is a lack of data and studies on cooperatives which would make it possible to debate these issues on solid grounds. In order to do so, it is necessary to know not only how well cooperatives withstood the crisis in comparative terms, but also more in general, what their competitive resources and capabilities are and to what extent they offer a solid foundation for moving forward with productive transformation processes.

Events like the Fagor Electrodomésticos crisis have given rise to a public debate on the pros and cons of the cooperative model

With these questions in mind, we adopt a similar approach to that taken regarding firm size. The second subsection of Section II provides a brief overview and discussion of the economic literature on firms with foreign capital and cooperatives. We then consider the weight of both types of companies in the Basque economy and in other areas. This is followed by three sub-subsections that shows how these types of Basque firms perform, comparatively speaking, based on a set of determinants of competitiveness, intermediate performance and final outcome indicators.

Lastly, there is an exploratory study on international niche market leaders (INMLs). In addition to reviewing the burgeoning literature and international experiences of this type of firm, it presents the results of fieldwork conducted by an Orkestra research team. This work has made it possible to individually identify an initial group of Basque firms that meet the criteria to be considered INMLs. It also pinpoints a number of characteristic features of their activity and the challenges they must face.

Firm size

Why it is important for productive transformation

For a very long time, the size of a firm was considered to be a source of competitive advantage. This was so much so that the belief that the competitiveness of American firms was largely due to their size, and so was one of the driving reasons behind the creation of the European common market.

Today, the advantages of large firms are not so clear, or at the very least, it is not simply accepted that size generally confers a competitive advantage. Therefore, the advantages of large firms that manufacture large quantities of mass-produced products have now given way to the advantages of flexibility and adaptability associated with small and medium-sized enterprises. In any event, the existence or lack of advantages will depend a great deal on the characteristics of the industry or area of activity in which the firms operate. Therefore, they will vary depending on whether or not economies of scale are important to the industry, on whether entrepreneurial or routine systems dominate, on the variability and volatility of demand, on the level of internationalisation, on whether the activities are labour-intensive or capital-intensive, etc. (Aranguren, 1998).

Even so, it is necessary to acknowledge that SMEs have specific weaknesses in certain areas (especially financing, internationalisation, R&D, and labour and management skills) and that their mortality rate is much higher than that of large firms. In fact, it has been recognised that a country's SMEs are strengthened in some of the aspects listed above when their economy also contains powerful industrial groups or corporations with solid technological and internationalisation capabilities, which act as drivers and flagships in these areas, playing a role in building, structuring and even training the rest of the economy. This subsection analyses the importance of firm size in the Basque economy by means of a comparative study of this variable in terms of determinants of competitiveness, along with intermediate performance and final outcome indicators.

Large corporations play a role in building the economy

The current situation in the Basque Country

One characteristic feature of the Basque economy is the presence of a large number of SMEs and a small proportion of large firms. But to what extent do SMEs represent a greater share of the Basque economy than in other areas?

Prior to this report, virtually every study on the size of Basque firms has been based either on information from the time of the firm's founding or employment data for the firm within the Basque Country. This has led to a repeated underestimation of the size of Basque firms or a measure which is not consistent with that used by the main international sources available.

Analysis of comparable data has made it possible to determine that:

The average size of an industrial firm is four times larger than in services

- In the Basque Country, average firm size differs significantly between industry and business services. In 2012, the average industrial firm in the Basque Country was four times bigger than the average services firm. The former had 16.5 workers,

higher than the average in the Czech Republic, Spain and the EU (7.2, 10.1 and 14.6, respectively), but less than half the size in Germany (34.9 employees). In contrast, services firms had an average of just 4 workers, a lower figure than in every territory except for the Czech Republic. Consequently, the sectoral makeup of a territory has a significant effect on its average firm size.

Large firms have a more limited presence in the Basque Country than in advanced EU countries and in similar enlargement countries

- In the Basque Country, there are fewer large firms in the industrial sector than in the advanced countries of the EU or in the enlargement countries that have also joined the OECD and have a similar type of productive specialisation to the Basque Country.
- In business services, there is a relatively high percentage of microenterprises. However, large firms also include some that employ a considerable number of people. As a result, despite the fact that the average size of a Basque business services firm (4) is much smaller than in the other territories (except for the Czech Republic), the average size of companies with 10 workers or more is relatively high in the Basque Country (49 employees).
- Between 2008 and 2012, there appears to have been a trend toward smaller firm size in the industrial sector in the majority of European countries. In the Basque Country, this trend was somewhat less marked.
- In both the industrial and services sectors, there are major differences in size between the various industries. For example, the Basque Country is noteworthy for surpassing the EU in coking plants and petroleum refining; electrical, gas and steam power; and pharmaceutical products. The region also specialises in the first two areas.
- Within business services, the industries with the largest firm size in the EU (as well as the Basque Country) are telecommunications, research and development, and ancillary services. But while the size of telecommunications firms in the Basque Country is notably smaller than in the EU, research and development firms are larger.

Having analysed the weight of Basque firms based on their size, each size bracket is described based on the determinants of competitiveness, intermediate performance and final outcome indicators. A summary of these results can be found in Table 4, which also compares the position of the Basque Country in these indicators with the advanced countries of the European Union.[6] This information is discussed at greater length below.

[6] The colour red denotes those indicators for which the Basque Country's numbers are lower than the EU. The colour green is for indicators for which its numbers are higher. And yellow indicates those for which its position is similar to the EU. Depending on the number of countries for which data are available, the advanced EU countries used are the traditional EU-15 (in most cases), the EU-14 or even the EU-10.

TABLE 4 Firm size in the Basque Country compared to Europe

		Industry (CNAE 05-39)					Business services (CNAE 45-82, except 64-67)				
		Small		Medium	Large	All firms	Small		Medium	Large	All firms
	Indicator (unit; year)	< 10	10-49				< 10	10-49			
Determinants of competitiveness	GVA/Turnover (%; 2011/2012)	34	32	23	17	25	28	26	42		30
	Labour costs per employee (*) (thousand €; 2011-2012)	35.9	39.8	45.2	51.1	43.1	36.9	35.4	33.4		35.4
	Firms that cooperate (% of all firms; 2013)		9.8	32	50	15.1		15.2	35.1	46.2	17.8
	Innovation expenditure (% of sales; 2013)		1.3	1.8	2.58	2		1.5	5.8	5.8	3.1
	Expenditure on machinery (% of innovation expenditure; 2013)		25.5	7.1	42.1	28.9		8.3	5.7	10.8	7.4
	Expenditure on external R&D (% of innovation expenditure; 2013)		17.1	20.5	19.4	19.5		8.8	26.6	16.9	19.6
	Debt (**) (%; 2013)	51		54.5	44.6	46.8	51		54.5	44.6	46.8
	Cost of debt (**) (%; 2013)	3.2		3.6	4.1	3.9	3.2		3.6	4.1	3.9
	Financial assets (**) (% of total assets; 2013)	34.8		48.5	65.8	59.3	34.8		48.5	65.8	59.3
Intermediate performance	Innovative firms (%; 2013)		40.4	72.6	82.5	47.6		40	60.6	69.2	42.7
	Firms with non-technological innovation (%; 2013)		15.5	26.2	46.3	18.3		21.1	32.6	53.8	22.7
	Firms with technological and non-technological innovation (%; 2013)		30.9	34.1	56.1	33		46	46.2	77.8	46.6
	Firms with product innovation (%; 2013)		21.2	46.2	58.8	26.9		21.2	38.3	65.4	23.7
	Exports (+) (% of turnover; 2013)	4.2	22.8	41.6	46.5	35.4	3.8	8.8	5.8	1.5	5.4
	New sales for the company (% of total sales; 2013)		7.5	10	20.2	13.7		3.5	18.1	19.2	9
	New sales for the market (% of total sales; 2013)		2.4	6.6	3	4.1		3.8	5.3	8.5	4.7
	GVA per employee (*) (thousand €; 2011/2012)	57	70	69	79	69	40	50	44		44
Final outcomes	Profit margin (**) (%; 2013)	1.9		4.9	8.3	6.8	1.9		4.9	8.3	6.8
	Asset turnover (**) (%; 2013)	0.7		0.6	0.5	0.6	0.7		0.6	0.5	0.6
	Total ROA (**) (%; 2013)	1.3		2.8	4.5	3.8	1.3		2.8	4.5	3.8
	ROE (**) (%; 2013)	0.5		1.9	6.1	5	0.5		1.9	6.1	5

Source: Eustat (Encuesta Industrial y de Servicios-Industrial and Services Survey. Encuesta de Innovación-Innovation Survey). European Commission (*Annual Report on European SMEs, 2013/2014*). Eurostat. CIS-2012. SABI-Informa and BACH project.

(*) Comparison with the EU-28.
(**) These indicators refer to all companies in the industrial and business services sectors. Comparison with the EU-10.
(+) EU data not available.

Better position than the EU
Similar position to the EU
Worse position than the EU

Determinants of competitiveness

Below are the main results of the analysis of firm size for the variables identified as determinants of competitiveness in the Basque Country:

- In almost all locations, the level of insourcing for a given area of economic activity tends to be greater in industry than in business services. Within industry, this is true of small firms more than of large ones. This trend is also found in the Basque Country, but accentuated. In business services, the level of insourcing in companies with 50 workers or more is much higher than in those with fewer employees, as well as their Spanish and European counterparts.
- Labour costs per employee in the industrial sector exceed those in business services in all areas. In comparison with other territories, Basque industrial SMEs have higher labour costs per employee. In contrast, this is not so prevalent in the case of large Basque industrial firms.
- In business services, labour costs per employee are also higher in Basque firms than in other areas. This gap is clearly wider in the smaller size brackets, but narrower for companies with 50 or more workers.
- In almost every territory, innovation intensity is higher in large firms than in SMEs, although this is essentially an effect of activity in the industrial sector, as this characteristic is not as marked in services. In the Basque Country, it is medium-sized firms that are in the best position compared to other territories in terms of innovation intensity (2.99%, double that of Germany at 1.44%). Another distinctive feature of the Basque Country is that while innovation intensity in the services sector (3.09%) is triple the average in the EU (0.99%) and Germany (1.15%), it is notably lower than the industrial sector in those regions.[7]

Innovation intensity in medium-sized Basque firms is higher than in other territories

- External R&D expenditure (in other words, R&D outsourced by firms to universities, technology centres, business R&D units, etc.) accounts for 19.5% in the Basque Country, a percentage which is notably higher than in other territories. This can be interpreted positively, in that Basque firms are utilising the R&D infrastructure to a greater extent than in other territories. In the Basque case, it is medium-sized firms (50-249 workers) that allocate the largest percentage of their innovation expenditure to external R&D and those which, along the same lines, in theory most use the R&D infrastructure.
- One noteworthy aspect is the small proportion of machinery and equipment expenditure within total innovation expenditure in the Basque services sector (when the literature highlights that innovation in this sector is generally more based on different sources of R&D). It should also be noted that large firms in the Basque Country report percentages which easily double those of small firms (when the literature also usually states that small firms tend to innovate more than large firms by purchasing machinery and less through R&D). This may also be related to the aspect discussed in the previous footnote.

[7] That R&D intensity is much higher in services and medium-sized firms in the Basque Country (and much lower in industrial and large firms) may be due to the unique makeup of the Basque Science. Technology and Innovation Network (RVCTI) and to the way in which Eustat R&D and innovation statistics track the activity of its stakeholders. For more details, please see *The Basque Country Competitiveness Report 2015 Cuaderno 2* (Orkestra, 2015b).

- The percentage of Basque firms that cooperate in innovation (16.3%) tops that of Germany (13.1%) and triples that of Spain (6.8%). In the industrial sector and in comparison with the other territories, Basque medium-sized firms again surpass other areas in their greater tendency towards cooperation. There was a growth trend in this area beginning in the early years of the crisis, although it appears to have been interrupted in 2013.
- The Basque Country is noteworthy for its cooperation with the R&D infrastructure. Services companies have a higher level of cooperation with the R&D infrastructure than industrial companies. In contrast, the opposite is generally true in the EU.
- Data on the ratio of financial assets to total assets for Basque firms show higher levels than in other territories for all size brackets. The gap between the Basque Country and Spain is found especially in the higher percentages of financial assets in large and medium-sized Basque firms, a difference which came about during the crisis period.
- As regards to indebtedness, it is not possible to discern any clear rules based on size. In the Basque Country, it is large firms which have a lower debt level, not being the case in other territories. To a large extent, this may be the result of the strong policy of debt reduction followed by large Basque firms during the crisis.
- With regard to the apparent cost of debt, given that larger Basque firms have lower debt levels and higher profitability, it is to be expected that they would also have a lower apparent cost of debt. However, the opposite is true: it is smaller firms whose apparent cost of debt is lower.[8]

Large firms have a lower debt level in the Basque Country, unlike in other territories

Intermediate performance

As regards to the performance and position of Basque firms by size bracket as far as intermediate performance indicators are concerned, the following are worth noting:

- In all territories, a firm is more likely to be innovative in the industrial sector than in services, as well as if it is a large firm rather than a small one.
- The percentage of innovative firms in the Basque Country (45.4%) is notably higher than in Spain (33.6%) and enlargement countries which are potential competitors, such as the Czech Republic (43.9%). However, it is definitely lower than the average for the EU-15 (54.3%), especially Germany (66.9%). In comparison with EU-15 and German averages, the Basque Country performs the worst in the small firms bracket and the best in medium-sized firms. In the latter bracket, it is slightly higher than the EU-15 (68.6% compared to 66.8%), although it is still lower than Germany (74.3%).

[8] Other authors such as Maudos and Fernández de Guevara (2014) and statistics from the Bank of Spain's Central Balance Sheet Data Office also confirm this puzzling result. To explain it, as indicated in the third subsection of the first section of this report, it is important to remember that the cost of existing debt may be different from that of new debt. With regard to the latter, according to the Bank of Spain, in January 2015, the APR (or annual percentage rate) for new credit transactions and loans to non-financial companies was 4.54% for loans typical of SMEs (in other words, up to €1 million) and 2.37% for those typical of large firms (in excess of the aforementioned amount). For its part, in the most recent edition (September 2014) of the Survey on the Access to Finance of Enterprises (SAFE), the European Central Bank indicates that for firms with fewer than 10 workers, the medium interest rate was 7%, while it was 5% for firms with 10-49 workers, 3.3% for firms with 50-249 workers, and for firms with more than 250 workers, it was 2.8%.

Medium-sized firms have the best results in technological innovation

- In the Basque Country it is medium-sized firms that have the best results in terms of technological innovation, especially process innovation, although they do not reach Germany's level.
- The Basque Country's worst results are in non-technological innovation: the percentage of firms in the Basque Country which develop non-technological innovations (20.3%) is less than half that of Germany (47.6%). It is even surpassed by potential competitors among enlargement countries, such as the Czech Republic (31.6%), as well as by Spain (23.4%).
- The percentage of innovative firms which simultaneously undertake both technological and non-technological innovation is much lower in the Basque Country (38.8%) than the EU-28 average (49.6%). This lower capacity for combining different types of innovation is particularly marked in Basque industrial firms (33%).
- In the EU as a whole, the crisis did not drive firms to respond by innovating (increasing innovation expenditure or the percentage of innovative firms), quite the opposite. In this regard, on the positive side, it should be noted that business innovation indicators for the Basque Country have remained stable.
- The only type of innovation which is increasing among Basque firms, rather than decreasing, is product innovation. Faced with a sharp drop in domestic demand, this strategy seems more intelligent than cost savings through process or organisational innovation.
- The Basque Country has a lower percentage of sales from unchanged products than the other territories (83.6% in the Basque Country, compared to the 87-88% generally found elsewhere). Comparatively speaking, the Basque Country proves more innovative in services and medium-sized and large firms. This higher degree of innovation is due to the Basque Country's better relative position in sales of products that are new to the company (in other words, incremental innovation), rather than sales of products that are new to the market (radical innovation). It is also worth noting that the response to the crisis by Basque firms involved product innovation (more in products that are new to the company than in products that are new to the market).
- As regards to productivity per employee, the industrial sector outperforms business services in all territories. Additionally, productivity per employee has a positive correlation with firm size in the industrial sector. In comparison with other territories, it is Basque industrial SMEs that have higher productivity.

Firm size is positively related to exports in the Basque industrial sector

- In the Basque industrial sector, firm size is positively related to exports. Although the number of enterprises with 250 or more workers is around 0.1% of the total, the value of their exports accounts for a considerable percentage (41.5%). In contrast, while microenterprises represent 92.8% of all firms, the value of their exports accounts for a low percentage of the total (7%). However, this same relationship is not found in the services sector. Instead, the tendency to export forms an inverted U pattern: it is low in the microenterprise and large enterprise brackets and high among small and medium-sized firms.
- In response to declining sales in their domestic markets, small and — most especially — medium-sized Basque enterprises have made a decided move into foreign markets, but without reaching the high levels of large enterprises.

Final outcome indicators

Based on the analyses carried out, we find that:

- Return on assets (ROA) figures indicate that in both the Basque Country and Spain, it is large firms that achieve the highest margins, and consequently, higher ROA. However, in the Basque Country it was these very firms that saw a larger decline in their profit margins and ROA during the crisis.
- With regard to return on equity (ROE) (net income as a percentage of shareholders' equity), the analyses clearly demonstrate the absolute supremacy of large firms, both just before the crisis and in 2013.

Conclusions and future recommendations

According to the economic literature, firms obtain advantages by being big as well as being small. Ultimately, whether the pros outweigh the cons will depend on the individual industry or area of activity. This relationship between firm size and performance or competitive results is more obvious in the industrial sector than in services, although it varies within each.

Large industrial firms reported the best results

It is in the industrial sector that firm size seems to have a more notable impact. The analysis has demonstrated that in the Basque Country, it is large firms which achieve the best performance and results, with small firms performing the worst (in innovation and R&D expenditure, in cooperation in innovation with other stakeholders, in investment in and financial ties to other firms, in percentage of innovative firms and turnover from new products, in productivity, in tendency to export, in profit margins, and in economic and financial profitability).

Nonetheless, considering variation in the different indicators and establishing a comparison with other territories, it is possible to conclude that in the Basque Country:

- Large industrial firms performed worse than SMEs in such important areas as exports, productivity and unit labour costs. However, as they started from a much more favourable position, despite their poor performance, they still have better results than SMEs in competitiveness indicators.
- Compared with firms in the same size bracket in other territories, the Basque firms with the best relative position are medium-sized industrial firms, not large ones.

It is advisable to support an increase in firm size in the industrial sector

Judging from the results, it seems advisable for public institutions to support an increase in firm size in the industrial sector (and perhaps in certain service industries in which size also seems to play an important role). This can be done through general policies, such as those that affect the factors which the World Bank (2015) has identified as supporting business (*Doing Business*). It can also be achieved through specific actions to support certain integration processes, especially in those industries or areas of economic activity in which the Basque Country appears to be relatively specialised and where the size of Basque firms is clearly smaller than in Germany. In particular, this is the case in several of the industries which make up the advanced manufacturing strategy, in some links of the energy value chain and the majority of

biotech companies completing their first scientific and technological developments, which need investment to undertake the implementation and commercial distribution stages for their knowledge and products. The most qualitative analyses of the thematic priorities of the Basque Country's smart specialisation strategy confirm this.

Nonetheless, the actions which can be initiated in order to boost firm size must be 'flexible'. In other words, size must be increased based on the problems to be resolved or the aim to be achieved with this size increase. In fact, various cooperation policies have been formulated in an attempt to respond to this need for flexibility. Examples include cluster, R&D&I cooperation and internationalisation policies, among others. Based on these, the actions reflect or take on different forms: clusters, platforms, networks, etc. In some cases, the organisations created to promote cooperation have their own physical reality (staff, equipment, etc.), while in others they are more properly termed 'virtual' organisations, whose capabilities are those of the stakeholders whose cooperation they seek to promote. As the international experience of advanced countries demonstrates, both of these have their place, provided that they lead to real cooperation processes and not simply subcontracting (the former) or the simple sharing out of tasks and individual developments among members, without true interconnection and interaction among stakeholders (the latter). Because the Basque Country's culture can best be described as 'hard', attempts to promote cooperation have followed the first path more often than the second. However, in both cases, these organisations do not generally function in a way that fully coincides with the true meaning of the term 'cooperation'. The answer is not therefore to give up on certain formulas (in particular, virtual centres, which the RVCTI restructuring seems to have opted for), but rather to push both paths towards what must truly be understood as cooperation.

SMEs should be the special focus of public policies

The analysis also points to greater weakness among small Basque firms. They must therefore be the focus of special attention in public policies. In the Basque Country, the Basque Government's policies have primarily centred on large and medium-sized firms, especially though policies geared towards technological innovation. Attention to small firms has almost exclusively been channelled through organisational innovation programmes, but on a marginal basis. Other Basque institutions, such as the Provincial Council of Bizkaia, have a certain history of gearing their programmes especially towards this group of firms. In Gipuzkoa, it has been local development agencies that have focused on this group, but without their own stable sources of financing.

Therefore, particular effort must be made to strengthen public programmes which promote types of innovation more in keeping with the characteristics of these firms (for example, organisational and marketing innovation). It is also important to work to ensure that the three main courses of action undertaken by the DDEC (and previously, Industry) (namely: cluster policy, structuring the RVCTI and internationalisation programmes) include specific actions to support this group. A clear example of this would be strengthening the role of vocational education centres within the innovation system and their thorough incorporation into the RVCTI. It would also be beneficial to promote institutional coordination in this area, beyond what is currently found in organisational innovation programmes (for example, Kudeabide), integrating the efforts made at different administrative levels.

Cooperatives and firms with foreign capital

Why ownership is important for productive transformation

Ownership is one of the business-related factors that are determinants of competitiveness. The literature has prioritised study of ownership based on the nationality of owners of capital. In the Basque Country, it is also important to study another type of company, cooperatives, because of their greater weight in the region's economy.

In the first case, analyses indicate that the advantages which firms with foreign capital have over domestic firms lie primarily in their intangible assets: management skills, technology and marketing, brand, etc. However, in Spain we find that generally speaking, compared to other types, these firms have a larger stock of physical capital, more skilled labour, higher wage levels, higher productivity, more R&D activity and foreign technology revenue, more solid organisational structures, a higher likelihood of exporting and tendency to import, and higher profitability.

It should be noted that, as Merino and Salas (1996) warned, some of these characteristics do not derive so much from the fact that the firm is held by foreign capital, but from other factors, namely: the industry in which the company operates and its size, which is generally larger than that of firms without foreign capital.

For its part, the cooperative model is a social business model which strives to achieve a balance between economic performance and social outcomes. This alignment between both is what contributes to the transformation and sustainable evolution of society. In recent decades, the economics and sociology literature have both studied worker cooperatives and their effect on economic indicators (for example, on performance, productivity and investment) and psychosocial indicators (such as motivation, satisfaction and commitment). They have also taken an interest in the positive outside impact which worker-owned organisations have on their surroundings. Generally speaking, these studies demonstrate that worker-owned firms (including worker cooperatives) have at least the same economic and social performance as conventional organisations. What is more, if worker ownership of capital is combined with their participation in governing the organisation, as in the case of worker cooperatives, the performance of these organisations improves (Fakhfakh et al., 2012).

The current situation in the Basque Country

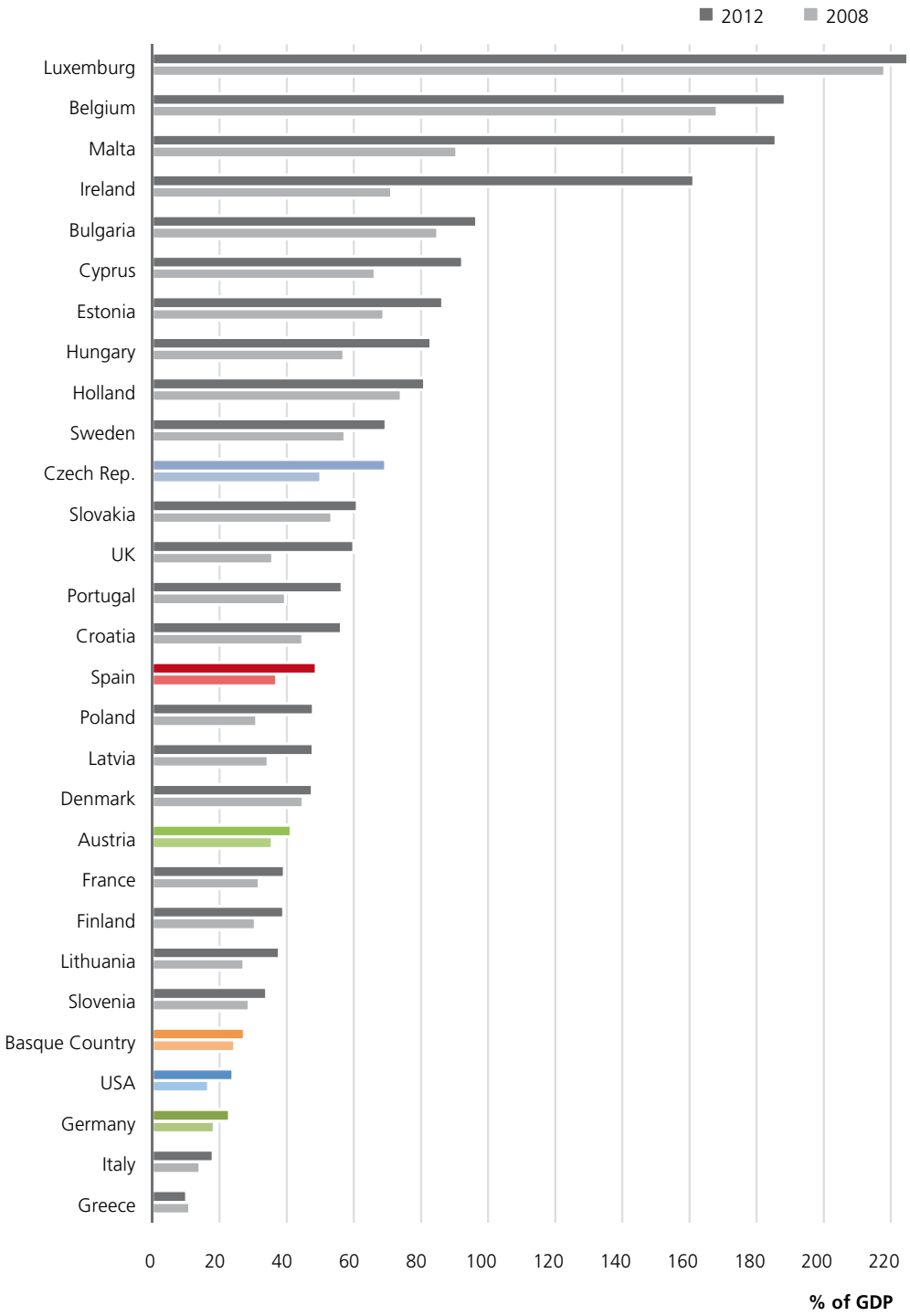
The analysis of the performance of different firms in the Basque Country according to type of ownership is organised as described below. Firstly, in order to be able to weigh the results obtained for the different determinants of competitiveness, intermediate performance and final outcome indicators, it is important to determine the relative weight of firms of this type in the region. Once this is done, their performance in the aforementioned indicators is discussed.

Presence of firms with foreign capital and cooperatives

The presence of foreign capital in the Basque Country is relatively small

The relative presence of foreign capital in a territory is usually measured by determining what percentage of GDP is represented by its stock of foreign direct investment. In the Basque Country, this indicator is relatively low (see Graph 8). Nonetheless, flows of gross foreign direct investment increased considerably in 2013 and 2014, such that this gap has begun to narrow.

GRAPH 8 Stock of foreign direct investment (% of GDP)



Source: Unctad, *World Investment Report;* Under-Secretariat of Economic Affairs and Competition. *Foreign direct investment;* and INE (National Statistics Institute), regional accounts. Compiled by authors.

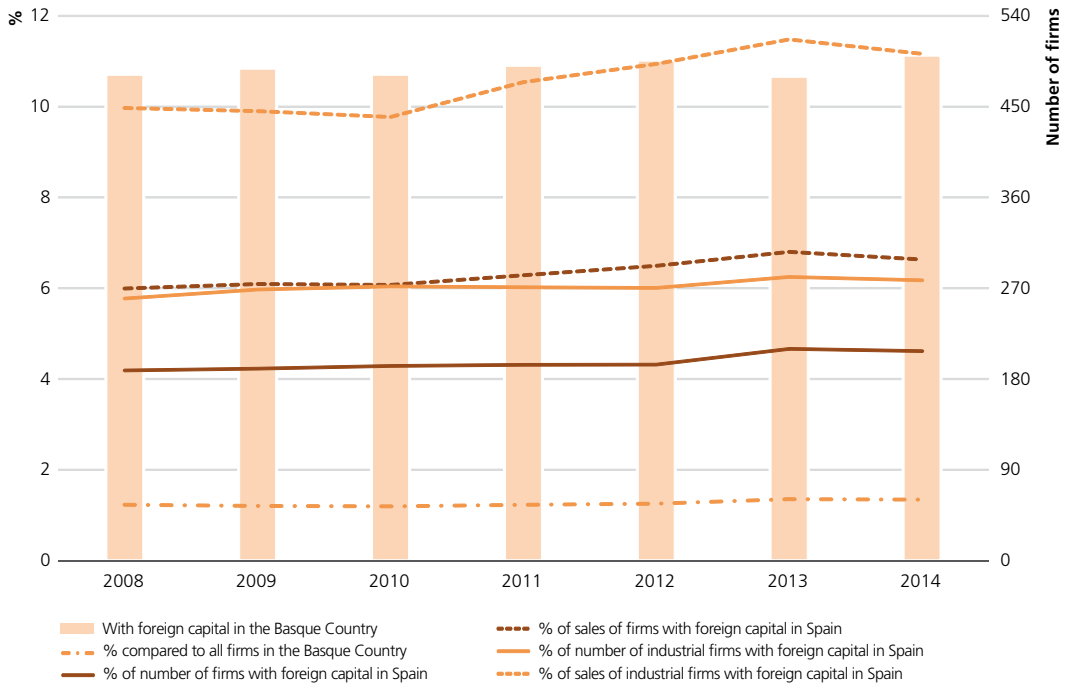
In fact, two other indicators demonstrate that firms with foreign capital have relatively little weight in the Basque Country (see Graph 9):

- Firstly, although the Basque Country accounts for 6.1% of Spain's GDP, it only attracts 3.1% of all tangible fixed assets of foreign companies operating in Spain. In addition, its share of the Spanish total dropped from 4% to 3% between 2008 and 2012.
- Secondly, the number of active firms with foreign shareholders in the Basque Country was 501 in 2014, representing 4.6% of all active firms with foreign capital in Spain. Operating income for these firms represented a somewhat higher value: 6.6% of total sales by Spanish firms with foreign capital. It is also worth noting that during the crisis, Basque firms with shares held by foreign capital managed to maintain, and even increase, their number and sales.

Therefore, given the Basque Country's economic and productive structure, the region could strive to attract a higher percentage of foreign capital. However, it is necessary to take into consideration that not all inflows of foreign capital are positive or contribute equally to progress, and that how beneficial foreign direct investment is, must be assessed on a case by case basis.

How beneficial foreign direct investment is, must be assessed on a case by case basis

GRAPH 9 Firms with foreign shareholders in the Basque Country, compared to Spain



Source: SABI-Informa. December DVD for the years indicated.

As regards to the presence of cooperatives in the Basque Country, the situation is different. Between 2008 and 2014, their weight in the Basque economy increased not only in comparison with all firms headquartered in the Basque Country, but also as compared to the total number of Spanish cooperatives (in fact, in 2014, they accounted for 7% of these). This is due to both the decrease in the number of firms headquartered in the Basque Country and the increase in the number of

Cooperatives now represent a larger percentage of the Basque economy

TABLE 5 Firms with foreign capital and cooperatives in the Basque Country

	Indicator (unit; year)	Firms with foreign capital	Cooperatives	Other firms	All firms
Determinants of competitiveness	GVA/Turnover (%; 2013)	38	17	19	n.d.
	Labour costs per employee (thousand €; 2013)	53	58	35	n.d.
	Firms that cooperate (% of all firms; 2013)	11.9	28.1	10.1	11
	Innovation expenditure (% of sales; 2013)	1.9	3.9	2	2.1
	Expenditure on machinery (% of innovation expenditure; 2013)	46.4	14	10.2	19.4
	Expenditure on external R&D (% of innovation expenditure; 2013)	10.5	17	22.6	19
	Debt (*) (%; 2013)	42	56.7	n.d.	49.6
	Cost of debt (*) (%; 2013)	4.1	4	n.d.	3.8
	Financial assets (*) (% of total assets; 2013)	85.4	57.7	n.d.	66.1
Intermediate performance	Innovative firms (%; 2013)	34.4	52.6	31.9	33.1
	Firms with non-technological innovation (%; 2013)	30	47.7	23.8	25.3
	Firms with technological and non-technological innovation (%; 2013)	12.7	16.3	11.8	12.1
	Firms with product innovation (%; 2013)	21.7	36.9	17.9	19.1
	Exports (% of turnover; 2013)	32.9	46.4	20.7	25.8
	New sales for the company (% of total sales; 2013)	14.4	16.8	9	11
	New sales for the market (% of total sales; 2013)	4	6.5	2.7	3.3
	GVA per employee (thousand €; 2011/2012)	174	58	49	n.d.
Final outcomes	Profit margin (*) (%; 2013)	24.1	4.5	n.d.	7.7
	Asset turnover (*) (%; 2013)	0.2	0.7	n.d.	0.5
	Total ROA (*) (%; 2013)	4.7	3.3	n.d.	3.5
	ROE (*) (%; 2013)	6.9	–7.3	n.d.	4.4

Source: SABI-Informa and Eustat (Encuesta de Innovación-Innovation Survey). Compiled by authors.

(*) Comparison carried out with regards to the total number of firms in the Basque Country.

Better position than other firms in the Basque Country

Similar position to other firms in the Basque Country

Worse position than other firms in the Basque Country

cooperatives. It therefore seems clear that the Basque Country is specialised in this type of firm. In addition, looking at 2014 figures, the average size of a cooperative was 32.4 employees, in other words, six times larger than the average Basque firm (5.3 employees).

Furthermore, the number of cooperatives grew steadily between 2008 and 2014. This may reflect the fact that, in addition to being more capable of withstanding a crisis, the cooperative formula may be an option for other types of firms in times of crisis, one to which their workers turn to prevent closure. It has also been confirmed that cooperatives tend to be industrial firms.

Cooperatives can be an alternative to closure

In fact, cooperatives account for 11% of industrial employment, whereas the percentage for industry and market services together is around 6-7%. Cooperatives have also reported much more positive variation in employment than the overall economy (especially in business services, where employment is even up). On the other hand, as regards to sales, cooperatives have not performed better than other companies. Lastly, in terms of assets, their performance is much worse.

Firms with foreign capital and cooperatives in the Basque Country have certain characteristics which differentiate them from other firms in the territory and their counterparts in Spain[9] in the different indicators (determinants of competitiveness, intermediate performance and final outcomes). This is shown in Table 5. The results are discussed below in greater detail.

Determinants of competitiveness

As regards to the determinants of competitiveness, firms with foreign capital and cooperatives perform differently. Firms with foreign capital have high levels of insourcing, higher machinery and equipment expenditure, a lower debt level and a larger percentage of financial assets on their balance sheets. By contrast, Basque cooperatives stand out from other companies in the region for their level of cooperation in innovation, and their innovation and external R&D expenditure, among other things. Specifically:

Basque cooperatives and firms with foreign capital insource more of their activities

- Basque firms with foreign shareholders and cooperatives are characterised by a higher percentage of added value generated within the firm compared to total turnover (or degree of insourcing). This higher level of insourcing is also accompanied by higher labour costs per employee.
- Cooperative establishments and, to a much lesser extent, establishments held by firms with foreign capital, cooperate in innovation in a higher proportion than other enterprises, especially in industry.
- In cooperative establishments, innovation expenditure, as a percentage of turnover, is almost double that of other enterprises. Establishments held by firms with foreign capital also spend more on innovation.

[9] The table presents a comparison between the two types of firm and other firms in the Basque Country. If the position is better, it is highlighted in green. If it is worse, it is marked in red. And if it is similar, this is indicated by yellow.

- In establishments held by firms with foreign capital, the most significant line of expenditure is machinery, equipment and software to implement product and process innovations. Cooperatives and other Basque firms have a considerable level of internal R&D expenditure. This has remained stable despite the crisis.
- Establishments held by firms with foreign capital rely more on generating internal capabilities (their ratio of external R&D expenditure to total R&D expenditure was 24% in 2013). Consequently, they contribute less to supporting the existing R&D infrastructure in the Basque Country. This percentage is higher for cooperative establishments and other firms (30% and 31%, respectively).

Firms with foreign capital make less use of Basque R&D infrastructure

- Firms with foreign shareholders have a lower debt level than firms as a whole, whereas cooperatives usually have a higher level, especially in the Basque Country.
- Firms with foreign capital have a larger percentage of financial assets on their balance sheets, whereas the opposite is true of cooperatives. This reflects the greater or lesser tendency to hold shares in other companies and provide financing to other firms, generally within the same group.

Intermediate performance

These two types of firms are noteworthy for having better innovation performance than other firms in the Basque Country. In both cases, product innovation is especially significant. For their part, cooperatives also excel in non-technological innovation. Another aspect worth noting is their degree of openness and internationalisation, and in the case of firms with foreign capital, their productivity. In other words, these two types of firms perform very well in intermediate performance indicators:

Cooperatives have better innovation performance in the Basque Country

- In the area of innovation, the percentage of innovative enterprises in 2013 was higher than the average for the Basque Country (33.1%) for both firms with foreign capital (34.4%) and cooperatives (52.6%), especially in the industrial sector (71.3%). This is quite a unique and distinctive aspect of the Basque cooperative movement. During the crisis, the percentage of innovative companies decreased for the majority of countries and firm types. By contrast, this was not the case with Basque cooperative establishments, especially industrial cooperatives.
- In terms of type of innovation, cooperatives have the greatest advantage in the area of non-technological innovation. This is in keeping with their type of ownership, which facilitates participation and professional management. In addition, we find that the percentage of firms that combine technological and non-technological innovation is also higher among cooperatives.
- Basque firms with foreign capital and cooperatives perform better in product innovation than process innovation, especially in industry. This helps them mitigate the Basque Country's weak performance in product innovation, above all in that sector. Likewise, we find that this type of enterprise also performs better in organisational innovation than in marketing innovation (except for industrial cooperatives).
- As regards to exports, Basque cooperative establishments have higher international sales (46.4%). This is due exclusively to the performance of industrial coop-

eratives. They are followed by establishments held by firms with foreign capital (32.9%), especially in industry.

- In terms of the level of product novelty for products marketed, it is cooperative establishments that have a higher percentage of new products (new to the company or to the market) compared to total sales, followed by establishments held by firms with foreign capital and, trailing them, other enterprises. All of these enterprises report positive variation in this variable, in this same order.

- Apparent productivity per employee is higher in industrial firms than in services, and in firms with foreign capital in Spain and the Basque Country (81 and 104, respectively) than in other firms (41 and 49, respectively). The productivity advantage of firms with foreign capital is particularly obvious among Basque industrial firms (264), whose productivity is several times higher than that of other firms in the Basque Country, as well as firms with foreign capital in Spain as a whole. Among cooperatives, those in the Basque Country have higher productivity than other firms, but the difference is not as marked as that of firms with foreign capital.

Industrial firms with foreign capital have higher productivity

- The advantages of Basque firms with foreign capital significantly outweigh the disadvantages deriving from their higher labour costs per employee (such that their unit labour costs are much lower than at other firms, especially in the industrial sector). On the other hand, the opposite is true for Basque cooperatives, with these types of firm having higher unit labour costs than other companies.

Final outcomes

As regards to outcome indicators, despite the fact that both types of firm perform well in terms of return on assets (ROA), it is firms with foreign capital that stand out in economic output indicators.

Specifically:

- Profit margins are higher among firms with foreign capital and lower among cooperatives. Profit margins are particularly high among Basque firms with foreign shareholders. This is due to the extraordinary profit margins reported by this type of company in two industries: rubber and plastics, and energy.

- Firms with foreign capital have lower asset turnover rates than firms as a whole, whereas cooperatives have much higher rates.

- Both firms with foreign capital and cooperatives report higher return on assets (ROA) rates than firms as a whole in Spain and the Basque Country.

- Return on equity (ROE) is higher than return on assets (ROA) for firms as a whole and for firms with foreign capital. However, this is not the case with cooperatives, whose performance has been hampered by poor results in services, especially in the retail industry.

Conclusions and recommendations for the future

Firm behaviour and performance vary according to ownership. In the Basque Country, we find that both firms with foreign capital and cooperatives play a very positive role in the Basque economy, with high average values for workers' salaries, innovation expenditure, cooperation in innovation, product innovation, exports, productivity and financial profitability. It would therefore be advisable to support their expansion and growth.

However, we also find that the stock of foreign direct investment in the Basque Country does not even total half of the figure for Spain. This is true despite the fact that firms with foreign capital have demonstrably higher profitability than those in the same category located in the rest of Spain, and that the Basque Country offers considerable assets associated with the information society to attract foreign firms that compete in innovation (see Orkestra, 2011). In any event, we do see signs of change, as gross foreign direct investment figures for the Basque Country saw a significant jump in 2013 and 2014, such that in 2014 they doubled and even tripled the 2008-2012 average. In fact, in 2014, the Basque Country attracted 8% of all gross foreign investment coming into Spain.

It is also noteworthy that firms with foreign capital in the Basque Country have a lower level of R&D activity than other firms and utilise Basque R&D infrastructure to a lesser extent. Consequently, with regard to this category of firm, Basque public policy should have the following aims:

- Increase their weight in the region's productive system (but without encouraging investment that is merely financial or speculative in nature). Although in principle, no investment in any industry should be restricted, it would be beneficial for investment to be linked to Basque strategic priorities. This is especially true because firms of this kind are associated with a larger size, which is crucial for developing specialisation in certain strategic priorities.

Basque firms with foreign capital should increase their R&D expenditure

- Boost R&D expenditure and its overlap with R&D infrastructure and cluster associations in the Basque Country.
- Utilise existing firms with foreign capital to attract more foreign capital and establish the target of also increasing their focus on exports.

With regard to cooperatives, the main problem seems to lie in the fact that their significant efforts in the spheres of innovation and internationalisation are unable to sufficiently increase productivity. Therefore, as productivity is not able to offset the higher labour costs per employee in cooperatives, unit labour costs increase, which results in lower profit margins and, given their higher level and cost of debt, negative financial leverage. In other words, Basque cooperatives are having problems translating their positive innovation input and output indicators into good economic output indicators.

Basque cooperatives perform well in innovation, but not in economic output

Additionally, the analyses have identified some problems with lack of transparency or information about the situation of cooperatives which will need to be corrected. Firstly, this lack of information creates conditions of unfair competition (insofar as non-cooperatives are actually required to provide information while the majority of cooperatives do not) and market imperfection (such as the absence of symmetric

information which is required by perfect competitive markets). Secondly, it prevents governments from designing proper public strategies and policies.

Therefore, once the inherent difficulties of designing public strategies and policies when information is lacking are overcome, it will be possible to implement actions aimed at improving the efficiency of these types of firms, so that their efforts on the input side and innovation results are reflected in positive economic results with an impact on the region.

International niche market leaders

Why they are important for productive transformation

International niche market leaders are also known as 'hidden champions'. This concept was popularised by German author Hermann Simon (1996 and 2009). He noted that a substantial portion of the volume and value of foreign trade in Germany did not come from large firms operating in well-established industries and markets, but rather from a large number of lesser-known medium-sized firms operating in niche areas and segments of somewhat under-the-radar markets, where they are global leaders with a large market share.

In fact, they are called 'hidden' because the products they manufacture lack visibility: they are products which do not have any appeal for the general public, as they are hidden within final goods, or are sold in business-to-business (B2B) contexts rather than business-to-consumer (B2C) environments.

Furthermore, the relative anonymity of these firms is somewhat deliberate, given that they do not seek media attention, out of a desire to protect their niche and position.

It therefore seems advisable to analyse the presence of this business phenomenon in the Basque Country and highlight some of the characteristics, attitudes, skills and strategic behaviour which characterise firms of this kind, as they may be an indicator of the productive transformation which has taken or is taking place within the region's economy, and which is sometimes overlooked.

The situation in the Basque Country

There are thirty hidden champions in the Basque Country

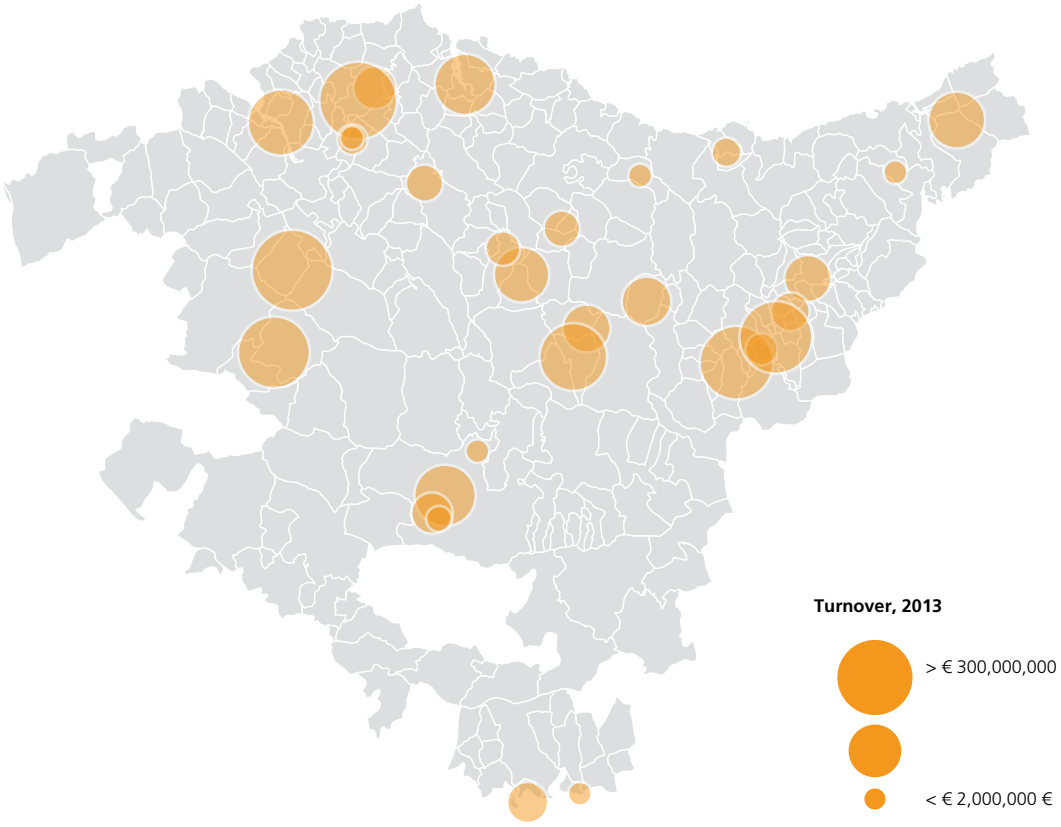
The analysis is based on an online survey which was supplemented by interviews with a number of firms in the sample. From this study, it has been determined that there are 30 cases of international niche market leaders in the Basque Country, a ratio of approximately '14 hidden champions per million inhabitants'. This is far from an insignificant number in comparison with countries where similar inventories have been made, including France, the United States and Japan (with ratios which range from 1 to 2 hidden champions per million inhabitants) and the Netherlands (where the ratio is 10). What is more, this ratio is in line with countries such as Switzerland, Austria and Germany (with ratios of between 14 and 16). However, it clearly lags behind what has been found in certain *Länder* (German regions), as both Baden-Württemberg and Hamburg have between 25 and 29 hidden champions per million inhabitants (although this is based on less stringent criteria).[10]

If the criteria utilised for the inventories made in other countries were standardised, it would be possible to conclude that the Basque Country is fertile ground for

[10] A number of criteria were applied to the analysis of the Basque situation. In addition to those aspects which characterise hidden champions, noteworthy criteria include being part of the industrial sector, not being owned by a foreign multinational which treats the Basque firm as a branch office with no autonomy, and not having turnover in excess of €1 billion. Another criterion which was included is that the firm must operate primarily in B2B markets. These criteria do not completely match the less stringent criteria used in the inventories made in Germany, Austria and Switzerland.

international niche market leaders (hereinafter INMLs). The location of these firms is shown in Map 2, where we can see that they are concentrated around two provincial capitals (Bilbao and Vitoria-Gasteiz) and in the counties of Goierri and Debagoiena.

MAP 2 Location and size of Basque INMLs by annual turnover



What are the main common characteristics of these firms in the Basque Country? The analysis of Basque hidden champions has determined that the majority act as pioneers in their market niche, where they have a high market share and work with extremely demanding customers (lead users) in the global market. They are therefore internationalised or are conceived from their very inception as having a global focus. They are highly innovative firms with considerable patenting activity. Specifically:

Basque hidden champions have benefitted from being the first entrants in the market

- 70% of the Basque firms analysed were pioneers in their market segment and therefore have enjoyed the benefits of being the first entrant.
- Some firms position themselves in specific niches before they become a lucrative market where large-scale demand begins to form.
- Their market share varies from case to case, although it can be described as high (24% of firms can boast more than 50% market share, 29% have a 26%-50% share of the market and 47% of firms have less than 25%).
- A slight majority of firms operate in oligopolies with a limited number of rivals that can truly be considered competitors with products offering quality and features that differ from theirs.

Basque hidden champions push their suppliers to excel

- As regards to demand, these firms identify the presence of lead users (highly demanding customers that push their suppliers to excel). These customers generally represent a considerable portion of the sales which can be achieved in their niche, as well as acting as opinion leaders. They also generate spill-over effects and facilitate access to the global market.
- Two characteristics of hidden champions are controlled, sustainable growth and maintaining a somewhat stable number of employees. In this regard, turnover for Basque INMLs grew by approximately 11% per year over the 2000-2013 period. During this same period, staff size increased an average of 5-6% a year. These figures can be considered relatively high given the general economic context at that time.
- Basque INMLs are highly internationalised. They obtain 86% of their turnover from foreign sales and the majority also have manufacturing facilities abroad.
- Whereas the most long-lived Basque INMLs were early internationalisers in their industry, those created more recently have typically acted as born globals, or firms that have had a global focus from their inception (Madsen and Servais, 1997).
- Ongoing innovation has made the majority of Basque INMLs, if not all of them, leaders in their respective markets. It is therefore not unusual to find cases of firms that invest up to 10% of their turnover in R&D. They also typically put themselves forward for a number of public programmes supporting innovation, primarily to finance projects in cooperation with third parties.
- Lastly, patenting activity is relatively high in these firms (an average of 23 patents per INML), although patents are not the determining factor which explains their success in the market.

Basque hidden champions have high rates of patenting activity

Conclusions and recommendations for the future

The analysis of Basque hidden champions offers a number of valuable lessons and conclusions relating to productive transformation.

First of all, specialisation in a specific niche market can be a double-edged sword, representing a potential check on the future development of these organisations. This is primarily due to:

- excessive dependence on or being anchored to certain markets, which may stop providing growth opportunities at a given time, or where it is difficult to increase or maintain a high market share because they attract a growing number of competitors;
- the possible 'commodisation' of their main product in a specific market, resulting in a jump in the number of rivals with greater ability to compete on costs;
- the possible existence of end customers or users with greater negotiating power.

The average size of a Basque hidden champion is ten times smaller than those found in countries with similar ratios

The analysis also demonstrates that the average size of Basque INMLs is approximately ten times smaller than in other countries with similar ratios. This may therefore make it advisable to grow in order to obtain other benefits of scale. To do this, it is necessary not only to gain access to the capital needed for this growth, but to have people who are capable of leading processes of this kind. In this regard, one

of the challenges facing this type of firm, in addition to expanding the components of the financing mix (to allow for the company's future growth), is to diversify the origins of their management teams (many of them are family firms, with room to further professionalise their management and internationalise their human capital).

Another consideration which comes out of this analysis is related to the connection between the activities of these firms and RIS3 strategic priorities. As they are highly innovative firms, most of which are pioneers in their respective market niches, they may be a reflection of the entrepreneurial discovery processes found in the territory and a reflection of emerging strategies.

Lastly, public policies should promote awareness-raising and the adoption of measures which can help tackle the challenges and possible vulnerabilities facing INMLs. These include staff mobility and hiring foreign staff, growth and business integration and availability of Basque investment funds, among other things.

At the same time, it would be advisable to share INML best practices with other small and medium-sized enterprises which aspire to internationalise or with firms which are already highly internationalised (but are not international niche market leaders). This may enable the Basque Country to become a business incubator, continuously producing new INMLs.

Lastly, having confirmed that the majority of INMLs are leaders in global value chains whose end customers (gatekeeping companies) are usually foreign firms, perhaps an effort could be made to attract foreign direct investment from firms that orchestrate global value chains. This may give current INMLs a freer hand and encourage suitable candidates to become INMLs. What is more, the path becomes smoother when it is possible to identify launching customers and international lead users in the vicinity.

Section III.
Industries and clusters

Alongside the literature which stresses the importance of firms having the internal resources and capabilities necessary for competitiveness and profitability, another school of thought points to the idea that a firm's profitability is dependent on the industry in which it operates (McGahan and Porter, 1999; Porter, 1979), as well as whether it is part of clusters or other cooperative schemes that support exploitation of external factors of various kinds (Porter, 1998). What is more, complementary to this, development economics and economic geography have repeatedly stated that economic development is not simply a quantitative matter (how much growth), but is also qualitative in nature (change or transformation in the makeup or framework of production) (Neffke et al., 2011).

A firm's profitability depends on the industry in which it operates and whether it is part of a cluster or other cooperative schemes

The growing and changing complexity of economic reality has led to the emergence of different concepts which seek to facilitate understanding and analysis of this productive structure and how to operate within it. In the first subsection of this third section, we review the recent literature on clusters, global value chains and platforms in order to present a number of concepts which will help readers understand the following subsections, as well as identifying key issues and those currently the subject of discussion in the literature.

The second subsection discusses a quantitative analysis of the productive structure and competitiveness of the different industries in the Basque economy from a comparative international perspective. The analysis was conducted based on the breakdown of economic activity into 38 industries provided by Eustat (Basque Statistics Office), to which the industry breakdown used in other sources (primarily Eurostat and the OECD) has been adapted. Based on these industries, data on different groupings of areas of economic activity is added in order to explore the interests and characteristics of these industries in depth (for example, industries are grouped based on their technological level or knowledge-intensity).

The indicators are divided into four groups: indicators relating to the relative weight or specialisation of the different industries or groupings of activity which make up the economy, indicators that reflect the variables or factors which determine competitiveness, intermediate performance indicators and final outcome indicators. Additionally, several shift-share analyses have been done in order to determine or break down the difference between the values for each territory (particularly the Basque Country) and the average EU value for a given variable, and to see to what extent this difference is due to the unique sectoral structure of the territory. See the appendix to *Basque Country Competitiveness Report 2015 Cuaderno 3* (Orkestra, 2015c) for information on what this entails.

The aim of all of this is to see what productive transformation took place in the Basque economy during the crisis and determine the current competitive position of the Basque economy, and more specifically, the industries linked to the three thematic priorities which have been selected by RIS3 for the future.

In any event, quantitative analyses based on statistical sources make it possible to gain a preliminary understanding of diversification or productive transformation and competitiveness. However, this is usually so varied and complex that real knowledge of what productive transformation is taking place and, most especially, of the hows and whys driving stakeholders, requires a different, more qualitative approach. This is all the more so considering that the new concepts or analytical frameworks

developed to comprehend this growing complexity have not yet been accepted by official statistics institutes and data continue to be published for categories which are not always the most suitable for a thorough understanding of the reality of the situation. For this reason, we also present three in-depth studies which have been prepared using various reports and a bibliography of a very different nature on these aspects, as well as interviews and discussions with stakeholders, both public and private.

This report analyses the thematic priorities selected by the RIS3 for the Basque Country

The structure described below was initially designed as a guide for gathering information and later organising the content of each of the three subsections devoted to analysis of the thematic priorities selected by the RIS3 for the Basque Country: biosciences, energy and advanced manufacturing.

- Initial delimitation of the cluster (or platform) linked to the priority and of the value chains which can be identified within it, as well as the key stakeholders or actors operating in this area. If applicable, this delimitation is based on the planning associated with the priority contained in the documents or strategies prepared by the Basque Government for this purpose.
- Analysis of the competitiveness diamond and identification of the main competitive challenges.
- Identification of the life cycle or maturity level of the cluster or the value chains which form it.
- Analysis of the paths to diversification (or productive transformation) and the types of entrepreneurship found in this sphere in the past, as well as possible future lines of diversification or development.
- Position of the cluster (or its possible value chains) within global value chains. Collaboration within the cluster (or clusters that make up the priority) or with other clusters in the Basque Country, and with clusters or initiatives in that sphere in neighbouring regions and other supraregional spheres.
- Cluster policy tools and actions utilised within this priority and its position in the overall RIS3 policy for the Basque Country.

Obviously, the previous structure has been applied with a certain degree of flexibility in the final drafting of the subsections, as the possible information gathered on each of the areas is not always as complete as desired. Without this flexibility, the mechanical replication of the same outline would be excessively repetitive and tedious.

Industries and clusters

Why they are important for productive transformation

Production activity is not homogeneous and the ability to both understand it and act on it requires mechanisms of organisation and classification. The same formula cannot be applied in all cases, but neither is it feasible to design responses and policies for each individual firm. Faced with this, the first and most common method of organisation is based on industry, which is also generally used by official statistics to classify production activity. Based on this classification, it is possible to analyse production activity and design industrial policy.

Although industry is still the predominant unit of analysis in statistics, in order to deal with an increasingly more complex world and overcome some of the deficiencies of analysis and policies deriving from a industry-based classification, both analysts and public policies have begun developing other concepts which, while not replacing industry, are complementary. These concepts include clusters, value chains and platforms.

They are defined as follows:

a) A cluster is a group of interconnected firms and associated institutions (training centres, research centres, business associations, government agencies, etc.) which are linked by common and complementary activities and interests and are located in close geographic proximity (Porter, 1990 and 1998).

b) Global production networks (GPNs) or global value chains (GVCs) are groupings headed by large global firms which control the finished product, brand or distribution (OEMs). They are made up of tier 1 global suppliers and tier 2 local suppliers, which may be grouped into clusters or regional industrial counties.

Global value chains are made up of global firms which control the finished product and by global and local suppliers

c) A platform is a combination of firms and organisations which may belong to different clusters and which operate in industries that exhibit related variety (Cooke, 2012, p. 1419).

It should also be mentioned that clusters, value chains and platforms are not static realities. Rather, they evolve and may be affected by territorial strategies in a given region. Consequently, RIS3 strategies have defined various paths by which regions and territories can diversify their productive structure (Aranguren et al., 2012; Orkestra, 2013):

- Modernisation. This is the improvement and diversification that take place within an existing activity, industry or cluster as a result of applying key enabling technologies (KET). In the Basque Country, one example of this is the revitalisation of the machine tools industry through the use of microelectronics in the 1980s and 1990s.
- Expansion (extending). This involves penetrating new markets or spheres of activity by taking advantage of basic similarities in scientific and technological knowledge between the original and the new activity. For example, expanding into offshore wind power from onshore wind power.

- Emergence or radical foundation. This is the appearance of an entirely new activity in the region. One example in the Basque Country is the appearance of biotech companies.
- Combination (cross-sectoral). This is the appearance of new activities as a result of combining different knowledge bases. One example is the development of the electric car based on existing automotive, energy and electronics capabilities.

The following pages begin with an analysis of productive specialisation in the Basque Country, for which the statistical classification of activities is followed. Secondly, we analyse three areas in the Basque Country which do not fully coincide with an industry-based classification and for which the concepts of cluster, global value chain and platform are therefore relevant. These three areas coincide with the three priorities defined by the RIS3 strategy for the Basque Country, which are found in PCTI-2020: biosciences, energy and advanced manufacturing.

The situation in the Basque Country

Sectoral analysis

The analysis presented below seeks to answer these two questions: *Based on the industrial classification used in statistics, what is the Basque Country's specialisation? How do these industries perform or what is their relative position with regard to determinants of competitiveness?*

Industry specialisation in the Basque economy

Basque GVA has a higher level of industrial specialisation than the EU as a whole, although this specialisation has decreased since the crisis began (going from 138 to 120). During the crisis, industrial GVA declined more than the overall Basque economy, and its relative weight dropped from 28% in 2008 to 24% in 2013.

The relative weight of manufacturing and construction in the Basque economy has decreased

The construction industry performed even worse than manufacturing during the period analysed, although better than in Spain. As a result, construction's share of the Basque economy dropped from 9.9% in 2008 to 6.5% in 2013.

Between 2008 and 2013, it was the service industry that had the best performance in the overall economy, especially non-market services. GVA for these went from 22.8% in 2008 to 26.9% in 2013, indicating that the Basque public sector (public administrations and defence, education and health) played an important role as a buffer during the crisis. We find a similar situation in market services, where GVA went from representing 38.7% in 2008 to 41.8% in 2013. As regards to Basque specialisation in services, it is similar to that of the EU (98).

Analysis of GVA specialisation by technology level shows that in the Basque Country:

- The weight of medium-low-tech manufacturing is especially significant (with its relative weight going from 12.1% in 2008 to 8.8% in 2013 and its specialisation rate dropping from 300 to 238).

- Medium-high-tech manufacturing has retained both its share of the economy and a specialisation rate similar to the EU as a whole.
- High-tech manufacturing has increased both its weight in the economy and its specialisation rate compared to the EU. However, its share of the Basque economy remains lower than in the EU as a whole (specialisation rate - 73)
- There is less specialisation in both knowledge-intensive services and less knowledge-intensive services compared to the EU as a whole, although during the crisis, the gap in specialisation rates did narrow for the latter.

If the relative weight of employment in each industry in the Basque economy is analysed, the pattern is similar to that for GVA, with the exception of differences of specialisation in certain industries. For example, in the electrical, gas and steam power industry, the Basque Country is under-specialised in terms of employment (42), but highly specialised in terms of GVA (142). In the research and development industry, the region is under-specialised in terms of GVA (60) but very specialised in terms of employment (127). Similarly, whereas in terms of GVA, the Basque Country is under-specialised in high-tech manufacturing, but when specialisation is measured in terms of employment, it appears quite specialised (119).

In terms of both GVA and employment, the Basque Country — along with Spain — has higher concentration rates (the degree to which GVA or employment is concentrated in a limited number of industries) than the EU as a whole, and especially the Czech Republic and Germany. However, during the crisis, the Basque Country reported a decrease in this rate, as well as a narrowing of the gap with the EU as a whole.

Alongside this, the Basque Country also saw a drop in differentiation rates (indicating to what extent there is a gap between the percentage distribution of GVA or employment in a territory and a given framework taking, in the case of the Basque Country, the EU as a benchmark). The sectoral structure of the Basque Country is thus now more similar to that of the EU than it was in 2008.

The sectoral structure of the Basque Country is now more similar to that of the EU

As regards to change in GVA, there was a negative trend in the Basque economy during the period analysed, with the annual rate of change being –1.44% (in real terms). This negative rate is higher than the drop in GVA for Spain (–1.34%) and much higher than the rate of change for GVA in the Czech Republic and the EU, where GVA was down 0.4% and 0.27%, respectively. Behind this negative trend for GVA in the Basque Country is the negative trend in industry, which experienced a greater decline than the other territories considered, and the significant decline in construction GVA, surpassed only by Spain.

For its part, change in employment was also negative in the Basque Country, declining 8.3% between 2008 and 2012. This was only surpassed by the decline in employment in Spain, where it dropped 13.6%. In contrast, the decrease was much smaller in the Czech Republic and the EU (2.7%). For its part, Germany increased its number of jobs.

The analyses indicate that the Basque Country has a certain degree of specialisation in industries whereas the EU as a whole experienced lower rates of GVA and employment growth during this crisis, meaning that its industry specialisation has

affected its overall growth rate. Nonetheless, to a large extent, the Basque Country's poor GVA and employment performance during the crisis was not due as much to its sectoral structure as it was to other factors which have an impact on GVA and employment growth (markets in which it operates, competitiveness, etc.).

Furthermore, with regard to export structure, we see a high degree of specialisation in medium-low-tech exports in the Basque Country as compared to the EU (216), as well as a low degree of specialisation in exports in high-tech industries (14). The Basque Country is specialised in industries which are more vulnerable to pressure from inexpensive products from countries with lower costs. The region also stands out in the negative sense for its low rate of specialisation in science- and technology-intensive industries (16). In contrast, the Basque Country has a higher specialisation rate in industries with greater economies of scale (127). Lastly, the Basque Country is widely known for specialising in exports of energy-intensive or natural resource-intensive products (188), followed by the industries included in the regional processing category (135).

The Basque Country specialises in industries that are vulnerable to pressure from products produced by countries with lower costs

Competitive sectoral positioning in the Basque Country

Table 6 shows the relative sectoral positioning of the Basque Country with regard to the EU and the determinants of competitiveness, intermediate performance and final outcome indicators.

As regards to determinants of competitiveness, the key results demonstrate the following:

- In 2012, Basque labour costs per employee were higher than the EU average and that of the three countries considered (Germany, Czech Republic and Spain). Wages per employee are higher in industries with a higher level of technology and drop as the technology level decreases. But the gap in labour costs between industries with higher and lower levels of technology is generally smaller in the Basque Country than in other countries (except for the Czech Republic).
- Between 2008 and 2012, the only country where the increase in labour costs per employee was lower than the Basque Country was Spain. Therefore, in terms of costs per employee, the Basque economy reduced some of its competitive disadvantage with the EU and countries such as the Czech Republic and Germany during this period. The highest increase in labour costs per employee, and therefore, the greatest loss of competitiveness was in medium-high-tech manufacturing and less knowledge-intensive services.

The Basque Country lost competitiveness in medium-high-tech manufacturing and less knowledge-intensive services

- Basque industry is somewhat specialised in high-wage industries. In theory, this is favourable, as it makes it possible to offer higher pay for work without hurting competitiveness, as the firms that represent the competition are also paying higher wages.
- The Basque Country's higher labour costs per employee compared to the economy as a whole are explained more by higher labour costs in the region in general than by its sectoral makeup. By contrast, sectoral makeup has a greater impact on labour costs in Germany and Spain (driving them up in the former and down in the latter).

TABLE 6 Summary of sectoral positioning in the Basque Country

	Indicator (unit; year)	Total	Agriculture and Fishing	Industry			Construction	Market services		Non-market services
				Manufacturing		Energy		Business services 1 (+)	Business services 2 (+)	
				Manufacturing 1(+)	Manufacturing 2(+)					
Determinants of competitiveness	Labour costs per employee(*) (thousand €; 2012)	38.4	21.7	44.0			53.3	32.9		40.6
	Hourly labour costs (*) (€; 2012)	24.5	15.3	27.0			30.6	21.2		27.1
	Rate of R&D expenditure (% of GVA; 2013)	1.7	0.2	3.5		0.9	0.3	1.8		0.1
	Debt(**) (% of assets; 2013)	47.7		54.4	62.8	38.0	57.1	60.5	47.5	
	Debt repayment capacity(**) (years; 2013)	10.0		19.5	16.8	6.1		16.3	11.8	
	Cost of debt (**) (%; 2013)	3.8		2.7	3.7	4.4	3.3	3.6	3.1	
Intermediate performance	Apparent productivity per employee(*) (€PPP/h; 2012)	64.0	29.6	73.1			62.2	54.8		79.9
	Nominal unit labour costs(*) (€PPP/h; 2012)	61.0	73.0	61.0			81.0	63.0		50.0
	Real unit labour costs(*) (€PPP/h; 2012)	60.0	73.0	61.0			86.0	60.0		52.0
	Exports per employee(*) (thousand €; 2012)	104.0	81.0	73		129.0				
	Profit margin(**) (%; 2013)	6.4		3.9	2.5	12.4	–4.1	1.9	8.4	
	Asset turnover(**) (%; 2013)	0.5		0.6	0.8	0.4	0.3	1.2	0.3	
	Operating asset turnover(**) (%; 2013)	1.2		1.2	1.2	1.2	0.6	1.9	1.1	
Final outcomes	Relative balance of trade(*) (value between -100 and 100; 2013)	12.8	–62.6	–98.5		69.8				
	Total ROA(**) (%; 2013)	3.4		2.1	2.0	5.3	–1.2	2.2	2.9	
	ROE(**) (%; 2013)	4.1		1.1	3.0	7.2	–7.7	–1.9	2.8	

Source: Eustat. OECD Anberd database. Eurostat. AEAT (Inland Revenue) and Comtrade, SABI-Informa and BACH project. Compiled by authors.

(*) Comparison with the EU-28.
(**) Comparison with the EU-10.
(+) Sector groupings:

- Manufacturing-1: divisions 10-23 (except 19) and 31-33, CNAE-2009.
- Manufacturing-2: divisions 24-30, CNAE-2009. Includes manufacturing industries more closely linked to the advanced manufacturing strategy.
- Energy and water: divisions 19 and 35-39, CNAE-2009.
- Construction: divisions 41-43, CNAE-2009.
- Business services-1: divisions 45-56, CNAE-2009.
- Business services-2: divisions 58-82 (except 64-66 and 70.1), CNAE-2009. Essentially includes more knowledge-intensive market services.

Better position than the EU
Similar position to the EU
Worse position than the EU

- In 2012, the average number of hours worked per employee was higher in the Basque Country than in the EU (especially in Germany), but lower than Spain and the Czech Republic. Generally speaking, this pattern is repeated in every industry. During the crisis, the working day tended to be shortened more in the Basque Country than in Spain. This increased the gap with Spain and reflected a different method of dealing with the crisis, one which was preferable from a social perspective.

- R&D intensity in the Basque manufacturing industry (3.5% R&D expenditure as a percentage of GVA) is much higher than in the other large industry groupings, although it significantly trails the EU countries for which data are available (6.3%) and Germany (8.3%). It should be noted that R&D intensity in a number of key activities which are included in the advanced manufacturing priority is lower (machinery and equipment) or considerably lower (transport equipment) than levels in Germany and the EU average. However, these data are affected by the fact that Eustat tracks R&D units separately from the parent company in the services sector.

Basque advanced manufacturing has low R&D expenditure intensity

- The debt level (debt as a percentage of total assets) among Basque firms is lower than that of Spanish firms, which in turn have a lower level than the average for the EU-10 and Germany. Especially noteworthy are the low debt levels in the energy, water and petroleum refining industry and in construction (particularly in comparison with other countries). At the other extreme, it should be noted that Manufacturing-2 (the category grouping together metal-based industries, most of which are linked to advanced manufacturing) has a higher debt level. Despite their lower debt level, Spanish firms require almost twice as many years to repay their debt out of their current operating income. However, the Basque Country is in a more favourable position, as Basque firms are able to repay their debt in half the time it takes Spanish companies (especially those operating in the energy, water and petroleum refining industry).

Basque firms are able to repay their debt in half the time it takes Spanish companies

- The cost of debt for firms in the Basque Country is somewhat higher than for Spanish companies. Therefore, the higher rate of debt level reduction in the region has not been accompanied by a greater reduction in the cost of debt, but rather the opposite. In 2013, we see the higher cost of debt linked to the two main groups of industries in which the Basque economy is specialised and which have been prioritised in the RIS3 strategy: advanced manufacturing and energy.

As regards to intermediate performance indicators, the analyses identified the following results:

- In the Basque Country, apparent productivity per employee is generally higher than in the other territories taken into account. The only exception is productivity in German industry, which is higher than in the Basque Country. Manufacturing industries with higher levels of technology have higher productivity rates, enabling them to pay more for factors of production. Comparatively, productivity is lower in high- and medium-high-tech manufacturing and higher in medium-low- and low-tech manufacturing. In the case of services, productivity levels are higher than in the rest of the studied territories.

- Basque productivity has a higher annual growth rate than the EU, Czech Republic and Germany. However, there are differences between industries. In industry and market services, Basque productivity has tended to perform more poorly than in the EU and Spain, and better than in the Czech Republic and Germany.

On the other hand, in construction, only Spain has higher apparent productivity growth per employee than the Basque Country. Lastly, the greatest improvement in Basque productivity is in non-market services.

- There is no disadvantage in terms of level of unit labour costs (ULC) in the industries most closely linked to energy (electricity, gas and steam; coking plants and petroleum refining; and electrical materials and equipment), an area chosen as a thematic priority by the Basque RIS3. However, there are disadvantages in ULC in industries tied to another priority: advanced manufacturing.
- Nominal ULC has a lower annual growth rate than in all other territories, except for Spain. It is therefore possible to conclude that, with the exception of the market services sector, the Basque Country has improved its competitiveness (reducing its 2008 disadvantage) compared to the EU, Czech Republic and Germany. However, it has lost competitiveness (increasing the disadvantage it already had in 2008) to Spain during the period analysed.
- Real ULC is growing in Basque industry. Like other conditions, this has a negative effect on business profit margins.
- Exports per employee are higher than in the other territories (with the exception of Germany). This is the result of the higher export levels achieved by the industries linked to energy, water and petroleum refining, to rubber, and to transport equipment. But exports per employee are below the EU average in other manufacturing industries in which the Basque Country has a high level of specialisation in terms of GVA, including metallurgy and metal products, and machinery and equipment.
- Between 2008 and 2013, the Basque Country reported less export growth than in the other territories considered. Specifically, the 15% drop in exports in the metallurgy and metal products industry is significant. This poor performance by Basque exports can be somewhat explained by the Basque specialisation in industries which generated less export growth in Europe during the crisis.
- The manufacturing industry's degree of openness to foreign markets is lower in the Basque Country than in the EU. In most cases, it is also lower than in each of the three countries included in the analysis.
- Profit margins are higher than (double) those of Spanish firms and the average for the EU and Germany, especially in the energy, water and petroleum refining industry. However, Basque profit margins have performed poorly compared to the EU in Manufacturing-2 (which includes a group of industries linked to the advanced manufacturing priority).
- The asset turnover ratio is lower than among Spanish firms, and these in turn have considerably lower ratios than in the EU.

Profit margins in advanced manufacturing have performed poorly compared to the EU in recent years

Lastly, as regards to final outcome indicators, Basque industries have the following particular features:

- The Basque Country's balance of trade experienced an upswing during the crisis, increasing from 0 to 13, although this was due more to declining imports than to export growth. Whereas in 2008, the Basque Country's relative balance of trade was lower than that of Germany and the Czech Republic, in 2013 it surpassed that of the other territories. In fact, the Basque Country has a positive balance of trade in the manufacturing industries where it has higher levels of specialisation.

Energy is the only industry with positive financial leverage in the Basque Country

- Comparing profitability with the cost of debt, the Basque Country has negative financial leverage when total ROA is used, and positive financial leverage if operating ROA is used. When total ROA is used, only the energy, water and petroleum refining industry had positive financial leverage. However, the number of industries with positive financial leverage is higher when operating ROA is used.
- Between 2008 and 2013, Basque ROE or **return on equity** experienced a more marked decline than in the EU, Germany and the Czech Republic, where it even increased from 2008 to 2013.

Analysis of RIS3 thematic priorities

The analysis of the three thematic priorities of the Basque RIS3 strategy presented below is intended to complement the preceding discussion and does not fully coincide with the analysis of industries included in the statistical sources. Table 7 shows the main characteristics gleaned from the analysis of each one of the three RIS3 thematic priorities for the Basque Country: biosciences, energy and advanced manufacturing. Each one is in a very different situation in the Basque Country, has a different international position and offers differing opportunities and challenges with regard to the territory's productive transformation.

TABLE 7 Summary of the characteristics of the three strategic priorities

	Biosciences-Health Care	Energy	Advanced Manufacturing
Share of Basque GDP	Less than 1%	Approximately 5%	More than 20%
Type of strategy	Disruptive, long-term, activities with high growth prospects	Combination of incremental and disruptive, both short- and long-term, activities with high growth prospects	Incremental, supporting and transforming the current approach, average growth prospects
Competitiveness level	Not yet competitive	Generally highly competitive	Competitive, but with some problems
Activities	— Biotech: human health (especially diagnostics). Not as advanced, bio agri-food and bio-industrial/environmental — Suppliers of specialised components, equipment and services for the bio and health care industry (still underdeveloped) — Users of traditional bio product industries in their products or processes (still underdeveloped)	— Businesses in which Basque firms are relatively well positioned (power grids, petroleum and gas, wind and solar thermoelectric) — Areas of emerging technology with relatively low turnover (energy efficiency, biomass and biofuels) — Areas that are not currently commercially exploitable businesses (storage, marine energy, electric vehicles and natural gas vehicles)	— Industries that provide materials and primary processing solutions (foundries, iron and steel, forging and stamping), production resources and systems (machine tools, accessories, components and tools) and advanced services (ICT services, engineering firms, consultancies, etc.) — Industries that are final users of energy, transport (aeronautics, automotive, rail, naval), biosciences and other industries (electronics, home furnishings)
Firms	— Two large pharmaceutical firms, small internationally and not drivers for other firms — One dozen medium-sized firms with completed technological developments at the marketing stage — Fewer than fifty firms without finished technological developments — Indefinite, but not large, number of firms that are bio industry specialised suppliers or users	— Large energy and generation operators, some of which are global leaders and value chain drivers — Large international manufacturers (some OEMs and other tier 1 and tier 2 suppliers) — Small and medium-sized enterprises that are suppliers to the above — Large engineering firms and installers	— Large number of equipment and component suppliers from different tiers that are well positioned in global value chains but generally dependent on OEMs — Relatively limited number of firms with their own product (generally specific production) and high percentage of processing firms — Large number of ICT firms, strong in software (security and ERP), but weak in hardware; limited verticalisation and integration with industry
R&D&I infrastructure	— A wide range of stakeholders. Comparatively significant: teaching hospitals, health research centres and CRCs; technology centres less important — Although biotech companies have R&D capabilities, proportionally, R&D infrastructure firms have much greater capacity (as they have been the main recipients of public aid), but they are not linked to business capacity	— Large range of stakeholders (without BERC, PROs or health centres) — Firms have extensive R&D capacity and generate most of the R&D they require, R&D infrastructure has very generic R&D capacity	— Very large range of stakeholders (except in health care) requiring restructuring. Comparatively important: technology centres, virtual CRCs, engineering schools and vocational education centres — BERC and physical CRCs do not interact with companies. Engineering schools and technology centres interact more, but only with large and medium-sized firms (which have significant capacity of their own), ICT services are essential, but not well integrated with manufacturing firms. Vocational education centres could support smaller firms in technical areas

	Biosciences-Health Care	Energy	Advanced Manufacturing
Investors	—Existence of local venture capital (for early stages) —Significant need for foreign venture capital —Need for Basque corporate (MCC, etc.) and financial (Kutxabank, VMBAs, etc.) groups to move into this area —Significant need for large pharmaceutical firms to provide financing and marketing	—Significant need for non-standard financing facilities for internationalisation activities (roll-outs, project finance, etc.), corporate growth (acquisitions, etc.) and development of intangible assets (R&D, brand, etc.) which would require development of the 'fifth helix' of innovation	—Significant need for non-standard financing facilities for internationalisation activities (roll-outs, project finance, etc.), corporate growth (acquisitions, etc.) and development of intangible assets (R&D, brand, etc.) which would require development of the 'fifth helix' of innovation
Government (I): who	—Participation of various Basque Government departments (especially DDEC. Health and Education). To date, led by the DDEC (previously Industry); but from now on, co-leadership with Health —Involvement of Provincial Council of Bizkaia, and to a lesser extent, Gipuzkoa	—Led by the DDEC (and its agencies) —Lesser degree of involvement by the three provincial councils	—Led by the DDEC (and SPRI) —Involvement of Provincial Council of Bizkaia
Government (II): agencies	—Creation of Biobasque-SPRI to implement the Biobasque strategy	—EVE (DDEC agency) responsible for energy strategy, including the Energibasque strategy for technological and business development since 2012 —SPRI (DDEC agency) also involved in technological and business development	—So far, there has been no specific agency for the platform, with SPRI taking responsibility for it
Government (III): intervention	Very high level of intervention due to the need to 'cause' the cluster to emerge (there being no existing fabric of biotech companies), as well as the complexity of the types of intervention required: promotion, regulation, validation, authorisation, market motivation, procurement, etc.	Significant level of intervention in the energy industry in general (being a key strategic input) in a number of different ways (mostly notably regulation and infrastructure development), but to a lesser extent in technological and business development, among other things, due to the significant capabilities and size of firms in the industry	High level of support for advanced manufacturing activities, but without an explicit strategy until recently, in part because of the strength of the companies themselves, and in part because it is a mature industry with fewer market failures that is not prone to mission-oriented policies
Cluster association/ platform	—One very new association, described as 'pre-cluster' by the Basque Government, which has limited resources and an approach more in line with that of an industry association (biotech companies only) than a cluster association (for the entire cluster and bio value chain) —The Biobasque Agency-SPRI leads strategy development. With the appearance of firms and the Basque Biocluster association, its role is shrinking and must be coordinated with the association	—There is a cluster association which has existed for some time, but it has played a limited role until recently, because large companies felt they could manage on their own —In addition to coordination problems between the two DDEC agencies that influence development in this area, there is the issue of coordination with the association (which is the result of public-private collaboration)	—The many industries and clusters that fall under this priority more accurately correspond to the concept of a platform than a cluster, and this is reflected in the existence of 12 cluster associations, 8 pre-cluster associations and 3 intermediaries

	Biosciences-Health Care	Energy	Advanced Manufacturing
Inter-cluster collaboration	Non-existent to date. Of potential interest: machine tools, EICT, agri-food, environment, paper and energy	Beginning of collaborations with Maritime Forum, environment, EICT, etc. Of potential interest: large energy consumers (Papel, FEAF-Fundidores, Siderex, etc.), and automotive, environment, construction, home furnishings, etc.	In addition to significant fragmentation among cluster and pre-cluster associations and other intermediaries within the priority, there is a lack of coordination, joint action and interaction among these associations, despite the high level of 'related variety' among them
Collaboration with other regions and participation in international networks	Potential for a macro-bioregion (Basque Country, Navarre, Aquitaine, Pyrenees, etc.), but only modest progress with Aquitaine thus far and none with Navarre. Involvement with Spanish and European associations representing the bio industry, but not part of the European KIC to be created for health.	No significant collaboration with other regions or collective participation in other industry or technology associations or platforms, with the exception of the cluster association's participation in the Vanguard Initiative.	Basque organisations participate in national and European platforms of different kinds (Manu-KET, Manufuture, EFFRA, etc.). Efforts are being made to secure inclusion in the KIC to be created in the near future for this area. The Basque Country is an active participant in the Vanguard Initiative
Level of maturity	Emerging activity worldwide, with the Basque Country somewhat behind	Combination of developed areas (power grids, petroleum & gas, wind and solar thermoelectric), emerging areas (solar, biomass) and infant industries (wave power, electric vehicles, storage and natural gas for vehicles)	Mature, but with transformation and modernisation possibilities
Knowledge base	Analytical and scientific	Synthetic and engineering	Synthetic and engineering
Paths to productive transformation	— For biotech companies, radical foundation — For specific bio and health care industry suppliers: expansion (still not very developed) — For traditional industries that use bio components: modernisation (still not very developed)	— The main paths are modernisation (e.g. incorporating ICT into power grids), expansion (e.g. moving from onshore wind to offshore, or diversification by many firms in traditional industries into energy) — For some new value chains (e.g. wave power): radical foundation — Combination for future chains (e.g. electric cars)	— The main path is modernisation (e.g. incorporating ICT or nano-tech) — Numerous cases of expansion with firms moving between clusters within the platform (e.g. automotive firms moving into aeronautics) — Servitisation and making the switch from offering a simple product to offering joint solutions with elements of modernisation (e.g. simply incorporating ICT) and combination (when the joint solution is complex and combines many different products and services)
Future development opportunities	— Of biotech companies, 60% operate in human health, 20% in agri-food and 13% in industry and environment. Established firms (and some new ones) develop therapeutic products; new products, personalised medicine, diagnostic systems and regenerative medicine — Potential specialised suppliers are machinery, metal items, rubber and plastics, IT, electrical and electronic equipment, precision equipment, etc. — Potential users are agri-food, industry, environment, human health and R&D, among others	— Smart power grid value chain — Growth of renewable energies — Energy efficiency in industry, transport and construction — Sustainable mobility and the use of other fuels in transport — Exploration and possible exploitation of non-conventional gas	— Competitive and eco-efficient manufacturing — New materials and complex structures — Safe and intelligent machinery and automation — Intelligent, collaborative and distributed manufacturing — New business models and high value-added services

	Biosciences-Health Care	Energy	Advanced Manufacturing
Entrepreneurial discovery	Varies enormously in terms of time frames, types of knowledge, financing required, marketing, role of government (regulation, validation, etc.), depending on the value chain (e.g. medicines or bio-detergents), path to productive transformation (e.g. radical foundation or expansion), source of the undertaking (e.g. science-push or demand-pull), possible size of the firms involved, etc.		
Types of innovation and innovative activity needed	— For biotech companies, R&D is significant, although they also require business development and marketing capabilities — For suppliers, essentially market knowledge and adding bio staff — For users, R&D activity and bio staff	— R&D, so far in engineering, but increasingly in science — Organisational and marketing innovation (corporate growth, new business models, etc.) and financial innovation (new financing facilities)	— R&D, so far in mechanical and electrical/electronic engineering, but with a growing need for ICT and science (nano, new materials, etc.) — Low percentage of firms with their own product and need for organisational and marketing innovation (ways of organising work, new business models and servitisation, etc.) — Organisational and marketing innovation (corporate growth, new business models, etc.) and financial innovation (new financing facilities)
Internationalisation	— The market for biotech companies is global, making it necessary to reach agreements with (or be part of) large international groups — Limited presence of foreign capital, although there are hints of interest in Basque firms	— Operators and distributors internationalise by setting up abroad (except for refining, which can be exported); acceptable level of internationalisation — Engineering firms and installation services operate and are established abroad quite successfully — Tier 1 and tier 2 manufacturers are internationalised, but size creates problems with regard to tackling new globalisation challenges; this is reflected in the acquisition of Basque firms by foreign investors — Lower tier manufacturers have problems internationalising and becoming properly integrated into global value chains.	— Although they are quite internationalised, large Basque firms are normally dependent on OEMs which control global production chains. Although they have moved up the chain, there are still problems, frequently linked to size, in achieving better access to or position in markets — In smaller firms, internationalisation is solely commercial in nature, and is frequently heavily dependent on a limited number of customers, as they do not have their own product
Size	Corporate concentration and bringing in new investors is one way to solve management, organisational and marketing problems at small bio-tech companies.	Manufacturers face significant problems of size in attempting to successfully undertake globalisation and tackle new technological, financial and commercial challenges. But these problems and how they are approached also differ depending on firm size, and large firms could do a lot to support small ones in solving these problems	Manufacturers face significant problems of size in attempting to successfully undertake globalisation and tackle new technological, financial and commercial challenges. But these problems and how they are approached also differ depending on firm size, and large firms could do a lot to support small ones in solving these problems
Strengths and weaknesses	See diamond	See diamond	See diamond

Source: Compiled by authors.

Below we describe some of the most significant characteristics of each of the priorities.

Basque Bioscience Cluster

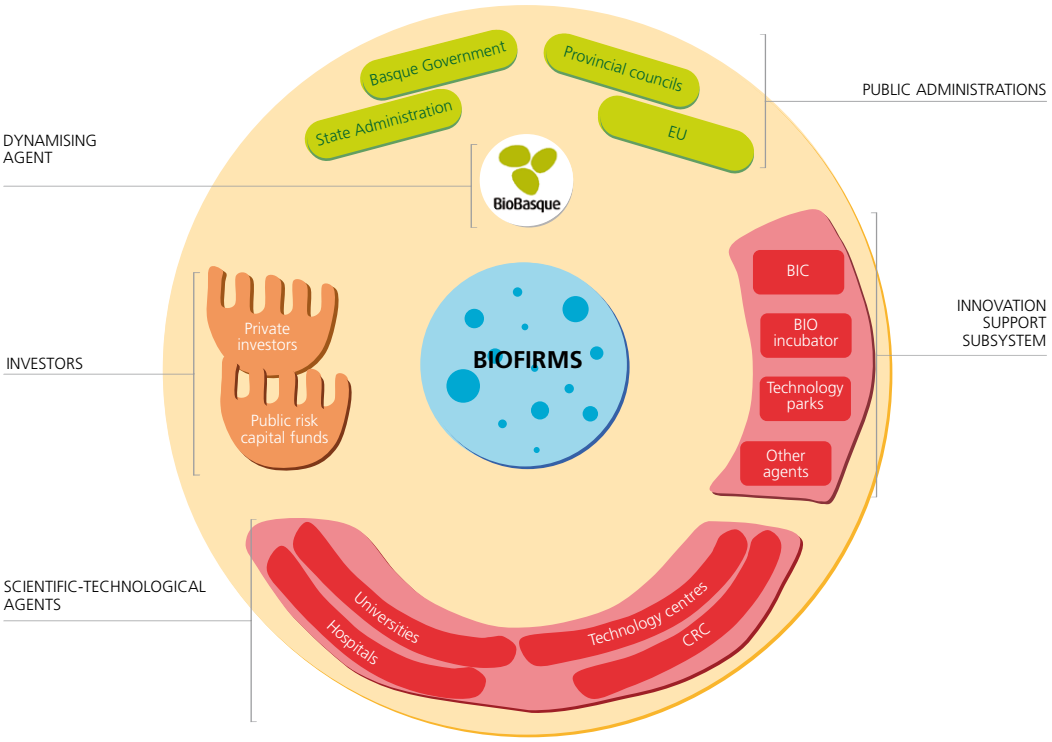
Key stakeholders in the Basque Country

The Basque Bioscience Cluster can be described as emerging

The Basque Bioscience Cluster can be described as emerging. Its most characteristic technology (although not its only one) is biotech. An association known as the Basque Biocluster was created for business development and to promote this technology. In order to develop a regional strategy in this field, the Biobasque Agency was created, part of the Basque Business Development Agency (SPRI).

The main types of stakeholders that make up this cluster in the Basque Country are firms, which occupy a central position within the cluster; knowledge infrastructure (technology centres, CRCs, hospitals and universities); investors, both public and private; and public administrations at the different territorial levels (Illustration 2).

ILLUSTRATION 2 Components of the Basque Bioregion



Source: Biobasque Agency.

Firms

Within the group of firms that belong to the biocluster, what are known as biotechnology or biotech companies should be differentiated from other firms which may also have some connection to the bioscience and health care industry. First, there are specialised suppliers to biofirms and the health care industry in general, which are not necessarily part of this industry in the strict sense (for example, capital goods manufacturers). Then there are firms which incorporate biocomponents and

bioproducts into their processes or products, and which may operate in traditional industries (for example, food products or environment).

The Basque Country has a little over fifty biotech firms, which make up the core of the biocluster. Many of them devote more than 75% of their activity to this field. And many also have fewer than 50 employees. Their main area of activity is human health, followed by agri-food and industry/environment.

The Basque Country has a considerable level of biotechnology R&D expenditure, both in comparison to its GDP and to total business R&D expenditure. However, despite this, in 2011 the number of PCT bio patent applications per million inhabitants filed by firms resident in the Basque Country was lower than the European average and that of the United States. Nonetheless, there is strong growth in patents. The delay in this activity in the region may be due to the relative youth of the Basque Bioregion and the long time frames generally required for scientific and technological developments in this sphere.

The biotech industry has continued to grow, despite the crisis

It is also significant that in the Basque Country, since the implementation of the Biobasque strategy, the number of biotech companies has increased, along with jobs, R&D staff and number of PhDs. This growth continued, although at a slower pace, even during the crisis.

Statistics however do not offer much information about the firms that do not form part of the main core of the biotech value chain in the Basque Country (suppliers and users). Now that there is already a core of biotech companies in place, it becomes necessary to turn efforts to diversifying traditional Basque industry into this sphere in order to increase its impact on the economy.

Knowledge infrastructure

The Basque Country's efforts and resources have not solely been focused on creating a core of biotech companies, but also on producing scientific/technological capabilities in this sphere (universities, BERC, CRCs, technology centres, hospitals and health research centres). Generally speaking, the fabric of the biotech industry is supplied by scientific/technological capabilities already in place in a territory, although this is not the case in the Basque Country. Support for creating bio infrastructure has made it possible to significantly increase bio R&D expenditure within the R&D infrastructure, an increase which was successfully maintained despite the crisis.

It should also be noted that more than 90% of university or publicly-owned R&D infrastructure is financed with public funds, while public financing is substantially lower in the case of CRCs and technology centres. In any event, it is biotech companies that receive a notably smaller percentage (almost half) of public financing for bio R&D expenditure.

If analysed from the perspective of producing scientific/technological capabilities, promotion of R&D infrastructure in the biosciences can be described as successful. However, there is one significant weakness when looking at its connection with the different components of the infrastructure and links between these and biotech companies. The proposed restructuring of the RVCTI is intended to remedy this

weakness. For example, there are plans to more closely link the source of funds for CRCs to the business sector (30%).

Investors

In addition to public funding, financing and investment institutions (especially venture capital) play a key role in the bio industry. This is due to the high level of risk and investment required.

Basque public and Spanish private venture capital invested in Basque biotech companies have both done quite well at financing new firms in the early phases, although there are financial gaps in the support given during later stages of product development more closely related to marketing and business development.

There are financial gaps in marketing and business development support in Basque bio companies

Growth opportunities are limited for Basque bio companies due to two reasons. Firstly, they are not the focus of international venture capital funds (either because of their lack of size or because they are not attractive). Secondly, there is a lack of bio industry specialisation among Spanish investors (caused by the financial crisis, financial tensions in health care systems, regulatory uncertainty and returns in the bio industry, among other factors). In this regard, other firms in the country could also act as investors in biotech companies which need to grow, as their growth and diversification potential make a policy of investing in the biosciences attractive. Nor should the importance of attracting international investors be overlooked, not only for financing in itself, but also because these investors offer the potential opportunity to gain access to international markets.

Government

The Basque Government's significant commitment to biosciences in the Basque Country is undeniable, as is the fact that without this commitment, the industry would not have the considerable scientific/technological capabilities it does today, as well as an initial core of biotech companies. In fact, one of the three thematic priorities of the new PCTI-2020 is the bioscience and health care industry. However, the plan does not establish which department is to assume leadership of this priority (it appears that it will ultimately be the responsibility of the Department of Health) or how it will coordinate with the other Basque Government departments involved or even with other institutions that exert influence in the cluster (for example, provincial councils). It will also be necessary to move towards greater coordination among government departments and other organisations such as the SPRI-Biobasque Agency, Osakidetza, etc., in order to better develop key aspects for the biosciences, including biobanks or innovative public procurement.

Promoting the biosciences requires greater coordination among stakeholders

The restructuring of the RVCTI approved by the government proposes substantial changes in order to improve linkages among the major stakeholders in the system. However, this is being undertaken separately for the different subsystems (in other words, science, technology and health care), a decision which in industries such as these is particularly questionable.

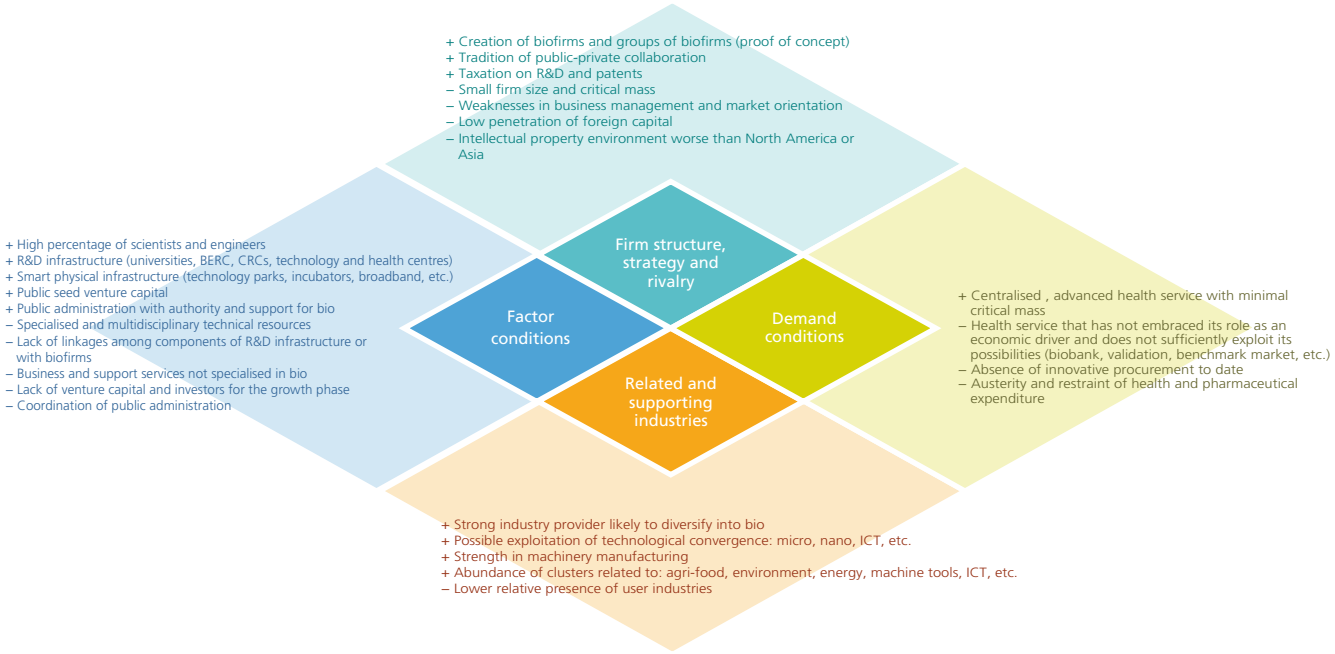
Unlike in other clusters, in the Bioscience Cluster, the cluster association is accompanied by a specific function of the SPRI-Biobasque Agency. Among other reasons, this was done because it is a young cluster association, belonging to the

category of pre-cluster associations created by the former Department of Industry. It is a somewhat modest association which has focused its efforts on implementing joint actions and on locating the necessary financing for bio companies. However, it has not yet been able to decisively take on or promote activities among clusters, facilitate the diversification of Basque firms in traditional industries into the bio industry (as either suppliers or users), or explore synergies with bio strategies in neighbouring regions (especially Navarre).

Competitiveness diamond, challenges and opportunities for diversification in the Basque Country's Bioscience Cluster

Porter's competitiveness diamond shows the main factors which determine the competitiveness of the Basque Biocluster (see Illustration 3).

ILLUSTRATION 3 Diamond model of strengths and weaknesses for the Basque Country's Bioscience Cluster



The fundamental challenges facing the Basque Bioscience Cluster can be summarised as:

1. Ensuring that all components of the cluster begin to interact and truly function as a system, including the science subsystem. In addition, research centres and hospitals will need to accept this, along with their care and research functions, they must also play a role in the area of economic development.
2. Attracting private capital (international) in order for biotech companies to grow.
3. Moving forward on specialisation for both the knowledge infrastructure and the region's biotech companies in areas or applications with proven capabilities and competitive advantages for the Basque Country.
4. Correcting weaknesses in the management and business development capacity of biofirms.

5. Leading some traditional industries into the bioscience industry: either as suppliers of intermediate goods, equipment or specialised services; or as users. To do this, it is necessary for the bio industry to work with other cluster associations and other types of organisations.
6. Clarifying and coordinating the role of regional public institutions (Basque Government departments and their agencies, public entities, foundations) and provincial councils in the bioscience strategy. In addition, it is necessary to reconsider the role of the public programmes and instruments included in the strategy and to implement other, more novel, approaches (test bed and validation, authorisation and certification, market motivation and innovative public procurement, reconsideration of tax incentives, etc.).

One of the main challenges that lie ahead is in fact the diversification of traditional industries into the bioscience industry, an aspect which still requires some stimulus. These are the potential paths to diversification in the bioscience industry:

It is necessary to promote the diversification of traditional industries into the bioscience industry

- *Radical foundation*. Thus far, this has been the predominant path to diversification. Biotech companies constitute a relatively new type of activity in the international context. In the Basque Country, their emergence is even more radical, as unlike in most bioregions, the Basque pharmaceutical industry had been quite a marginal activity until this strategy was implemented.
- *Extending*. This path to diversification includes cases in which traditional firms (such as Cikautxto; see Orkestra, 2013) have become suppliers for biotech companies or the health care industry.
- *Modernisation*. Productive transformation is linked to incorporating biocomponents into a company's products and processes. Thus far, this resource has been scarcely used in the Basque Country, although it offers a great deal of potential.
- *Combination*. It is true that quite a few new products from biotech companies are the result of the combination or convergence of different technologies (bio, nano, ICT, etc.). However, beyond this, we do not know of any Basque biotech companies that have combined their capabilities with those of other firms to offer new products which neither of the companies combining their capabilities previously produced.

If we analyse diversification through radical foundation, the international pattern of biotechnology development has generally consisted of the creation of research-intensive SMEs. These are usually university spin-offs formed as a collaboration between a scientist and a professional manager, with venture capital support, whose aim is to apply new scientific discoveries to commercial product development. In countries with an advanced bio industry, the product offered by these SMEs has consisted almost exclusively of research. However, from their inception, these SMEs also developed the ability to enter into future forms of collaboration (licensing agreements and strategic partnerships) or even takeover agreements with major firms already established in these industries, making it possible for them to gain access to financing and markets (Genet et al., 2012; Rothaermel and Thursby, 2007). In the Basque Country, the academic world has had less involvement in business start-ups. Over time, we find that new firms from the private sector and those created by local stakeholders are increasing their share in comparison with others. For this reason, entrepreneurial discovery processes — which advocate smart

The Basque academic world is less involved in the creation of biotech companies than in other countries

specialisation strategies based on research and innovation (RIS3) — should promote new science-driven biotech companies (creating spin-offs from universities and research centres, technology centres and health centres). This will enable projects to be identified, verified and assessed by experts in the bioscience industry (specialised investors, consultants and the serial entrepreneurs mentioned earlier) to evaluate their potential market.

Alongside this, it would be advisable to support spaces and processes for disseminating information to potential entrepreneurs about the existing scientific/technological capabilities in the bioregion, as well as about the market trends and needs identified (both international and local).

Mention should also be made of the entrepreneurial discovery processes whose aim is to support the diversification process for firms in traditional industries, allowing them to move into the health care or bioscience markets, thus creating cluster suppliers in the biosciences. These 'extending' diversification processes require the collaboration of biotech companies and the Basque health care industry. In addition, cluster associations operating in what are considered the main user industries (for example, agri-food and environment) could act as facilitators or motivators for these diversification processes. This role could also be played by a number of collaborative institutions (such as, for example, business associations, chambers of commerce, local development agencies, etc.), corporate groups (for example, MCC) or even certain components of the knowledge infrastructure with connections to numerous firms, such as technology centres, engineering firms and consultancies.

Other noteworthy aspects

Collaboration with other clusters, other regions and global value chains

To date, there have been no noteworthy actions in the area of collaboration between the Bioscience Cluster and other clusters in the Basque Country. In theory, the clusters which might offer more fruitful opportunities for collaboration are: on the supply side, machine tools and ICT; and on the demand side, agri-food, environment, paper and energy.

In terms of relations with other bioregions, together with Catalonia, the Basque Country has been among the most dynamic and concerned with strengthening and having a presence in the various initiatives in this area established in Spain, as well as various European projects. It should also be mentioned that there is quite an active relationship between the Basque and Aquitaine bioregions. In contrast, despite the fact that in theory, there are significant synergies and complementary elements which could be exploited, relations with Navarre have been limited. These have primarily involved private stakeholders rather than the institutional sphere. Additionally, with the aim of achieving critical mass, it might be possible to consider promoting a macro-bioregion containing the Basque Country, Navarre, Aquitaine and part of the central Pyrenees region.

The Basque Country, Navarre, Aquitaine and part of the central Pyrenees region could make up a macro-bioregion

Regarding internationalisation and integration into global value chains, in order to tackle the growth stages, it is necessary to attract international investors, which contribute both financing and international marketing and distribution capabilities, along the lines of the path already being followed by companies such as Progenika.

Life cycle of the Bioscience Cluster, cluster policies and the role of RIS3

The Basque Bioscience Cluster is lagging considerably behind in comparison with clusters which emerged naturally in certain regions of advanced countries (Boston, Cambridge, Switzerland, etc.) and also as compared to more guided or created initiatives implemented in some countries (Quebec, Netherlands, Finland, etc.).[11] Even so, the Basque Country was the first Spanish autonomous community to design a specific strategy for the biosciences, as acknowledged by the Cotec Foundation report (2006).

The principal milestones of the strategy involved setting up the two CRCs specifically associated with it (Biogune, which began operating in 2005, and Biomagune, which started in 2006) and the establishment of the Basque Biocluster, an association which brings together biotech companies, in 2010.

Today, the Basque Bioscience Cluster is clearly in the emerging stage, having moved past the formation phase in the early years of the century, when there were only a few firms, certain scattered scientific/technological capabilities and a health care system almost exclusively limited to its patient care function.

Once the main foundations upon which the cluster is to rest have been created and begin operating, it is time to move on to the next phase. At this stage, efforts must be focused on most effectively forging linkages amongst all of the different components: amongst science and technology stakeholders and between them and biotech companies; the different departments, agencies, public entities and foundations of the Basque Government and other Basque public institutions; and biotech companies and the other industries which could potentially serve as suppliers or users in the bioscience value chain. It will also be necessary for the Bioscience Cluster to forge suitable connections outside the Basque Country. This will enable biotech companies to enter the growth stage by marketing in international markets and attracting financing and international investors.

The Biobasque Agency played a more crucial role than the cluster association in developing the bioregion. At this time, the association is beginning to take a more active part in cluster operation, but its activities are basically limited to the sphere of biotech companies, supported and supplemented by the work of the SPRI-Biobasque Agency.

It would be preferable for the cluster association to serve as a key figure in entrepreneurial discovery processes, acting as promoter and facilitator, although the direct participants in these processes should be the actual economic stakeholders involved in their implementation, with firms playing a prevalent role. To achieve this, it would be necessary to reconsider its scope of action (moving away from its conception as an industry association to that of a cluster association), as well as the resources to which it has access. In addition, in that the three thematic priorities are complementary and must exploit synergies and support each other in the process of technological convergence, they should receive the support, complementary efforts and monitoring of the Biobasque Agency (or, if appropriate, of the agent or general agency created to support the execution and implementation of the thematic priorities contained in the PCTI-2020 and RIS3).

[11] This is explicitly mentioned in the document *Biobask 2010. Estrategia de Desarrollo Empresarial basado en las Biociencias en Euskadi* (Biobask 2010. Bioscience-Based Business Development Strategy in the Basque Country), published by the Basque Government in 2003.

In addition, it is necessary to change the compartmentalisation that produced the cluster policy, ignoring the cross-sector nature of certain key factors of competitiveness and the need to exploit synergies and complementary elements, and to develop cross-fertilisation processes among cluster associations. Furthermore, in clusters like bioscience, there is a need to involve other government departments in the life of the association, beyond just the Department of Economic Development and Competitiveness. Lastly, the Bioscience Cluster highlights the need to reconsider the range of policy instruments and public intervention, and the need to move towards softer instruments, which are not so heavily supported by simple subsidies, on which the government and the association must work more closely.

There is a risk that no organisation will take on the necessary leadership to move forward in the biosciences priority

Today, the biosciences have little relative weight in the Basque economy and their management is distributed amongst several government departments. There is therefore the risk that, at a time of insufficient resources, nobody will want to assume the leadership role necessary to take a leap forward. There still remains the task of forging relationships and connections, a somewhat invisible but equally important job which requires a great deal of time and management. What is more, the types of public intervention required by this industry are somewhat different from those usually found in traditional industrial sectors. All of this entails the risk that executing and implementing this priority will be pushed into the background and that no government body will take it on as one of its top priorities, and that firms will not seek (or be able) to lead its development. In addition, as the technical knowledge required is greater, as are the time frames and risks posed by investments in this industry, the financial system and Basque investors may tend to overlook the needs of the Bioscience Cluster in this regard.

However, the biosciences are a commitment which the Basque Government, economic stakeholders and society in general should embrace. Their development would enable the Basque Country to diversify into the types of activities which require highly skilled and high value-added labour, with significant prospects for growth and the ability to apply them to the rest of the economy, and whose effects are not limited to the economic sphere, but go beyond it to health care and other major social challenges.

Basque Energy Cluster

Key stakeholders in the Basque Country

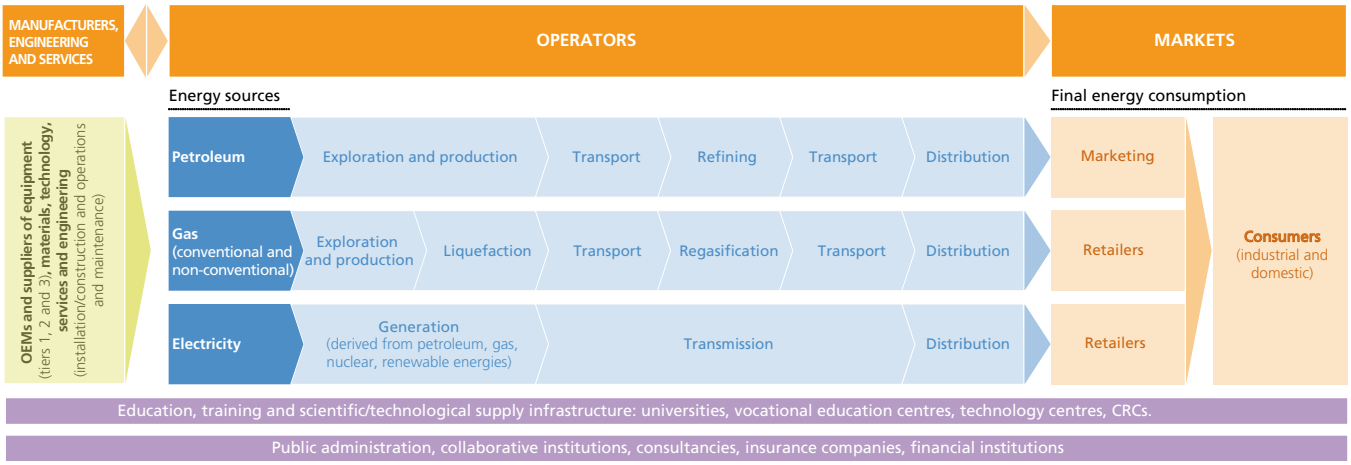
The Energy Cluster is made up of a limited number of large firms and a large number of small and medium-sized enterprises

The Basque Country's Energy Cluster has two unique aspects which differentiate it from other strategic clusters. The first is that it groups together different value chains that include producers and distributors of different forms of energy, manufacturers of capital goods and components, engineering firms and other companies offering specialised services for the energy industry. The second is that it is made up of a small core of very large firms — some of them global leaders in their respective industries — and a large number of small and medium-sized enterprises, most of which have a high degree of internationalisation.

The map of the Basque Country's Energy Cluster below includes primary energy sources (fossil fuels and renewables), the energy vectors used for their storage, distribution or use (petroleum, gas and electricity, which involve exploration,

production, refining, gasification, electricity generation and other activities), the value chain from the point the energy is obtained to its final use (generation, conversion, transmission and distribution, and storage) and the supply chain (equipment and component manufacturers, installers, specialised services and energy operators and carriers, up to the final consumers) (see Illustration 4).

ILLUSTRATION 4 Map of the Basque Country's Energy Cluster



Source: Compiled by authors OEM: original equipment manufacturers.

In addition, the cluster has associations and organisations such as the Basque Energy Cluster (ACE) and the Basque Government's energy agency (Basque Energy Agency or EVE), as well as two major financial institutions with a significant shareholding in several firms in the Energy Cluster: Kutxabank and BBVA.

The cluster is organised around value chains in areas of the energy industry with different life cycles:

- Four which correspond to businesses in which Basque firms are relatively well positioned (T&D, petroleum and gas, wind and solar thermoelectric).
- Six in development, which correspond to emerging areas of technology and have relatively low turnover (energy efficiency, biomass and biofuels) or which, in general, are not yet commercially exploitable businesses (storage, marine energy, electric vehicles and natural gas for vehicles) (ACE-EVE-Europraxis, 2012; ACE, 2014).

The Euskadi RIS3 Strategy, in line with the 2014-16 Industrialisation Plan and the Euskadi 2020 PCTI, has chosen energy as one of its strategic priorities. In this regard, the Department of Economic Development and Competitiveness (DDEC), SPRI and EVE complement each other in their functions in order to achieve industrial, energy and economic development in the territory. The first is responsible for the Euskadi RIS3 Strategy, which includes the commitment to scientific/technological and economic/entrepreneurial development in the area of energy as one of its vertical thematic priorities. Within Basque energy strategies, EVE works to strengthen existing industries and infrastructure in the region, as well as to develop and collaborate with firms on creating markets for energy technology and industry.

Until 2009, the energy cluster association (ACE), which has a very limited structure in comparison with other cluster associations, focused primarily on technology (R&D projects) and joint promotion abroad. Over the course of 2014, it prepared a new strategic plan for the 2015-2018 period (PECE 2018). This plan is closely aligned with the Basque Government's new cluster policy for the 2015-2020 period, the executive summary of which used the ACE value propositions as a model (SPRI, 2014).

Competitiveness diamond, challenges and opportunities for diversification in the Basque Country's Energy Cluster

Porter's competitiveness diamond (see Illustration 5) shows the main strengths, weaknesses, opportunities and threats in the Basque Country's Energy Cluster.

Generally speaking, the Energy Cluster is facing a global energy situation marked by sustained growth in energy demand which appears disassociated from the rate of economic growth. Furthermore, growth and development prospects vary significantly by geographical area, although within an increasingly more globalised single market (IEA, 2014a and 2014b). In addition, significant energy transitions are being undertaken, with repercussions for the energy mix, and consequently, for energy-related industry and technology. The situations described above point to a rise in business opportunities linked to an increasingly more global market. This will increase the size, resource and capability requirements for firms seeking to enter or remain in the market.

Globalisation of the market increases the size and resource requirements for firms in the cluster

In the European Union, the Commission has just passed an energy strategy focusing on the following priorities:

- Increasing diversification of energy sources to reinforce energy security.
- Strengthening the role of renewable energies and energy efficiency (particularly in transport and construction) to accelerate the transition to a low-carbon economy.
- Completing integration of the single European energy market, with cross-border energy transmission and distribution networks.

The Energy Strategy for the Basque Country 2020 is closely aligned with European Union priorities, particularly in the areas of renewable energies and energy efficiency (DIICT-EVE, 2012).

Some of the most noteworthy strengths of the Basque Country's Energy Cluster are:

- The existence of good energy, science and technology infrastructures in the region, as well as training and education centres for employees of the industry (vocational education centres and universities).
- A significant industrial legacy linked to the long-standing tradition of electric power in the Basque Country and to the presence of firms such as Iberdrola and Petronor, which act as economic drivers, as well as considerable demand for energy and energy solutions from industry.
- The presence of large firms serving as economic drivers (energy industry operators and large manufacturers and engineering firms), a considerable number of large

and medium-sized firms and a more extensive fabric of SMEs (predominantly family firms). As a whole, these firms are internationalised and have good technological capabilities and good R&D ratios.

The most important weaknesses identified are the following:

The lack of 'financial muscle' and average size of Basque firms are two significant weaknesses

- Limited and uncompetitive financing, especially in terms of international financing transactions. This is due firstly to the small average firm size, which forces companies to turn to the regular financial market; and secondly, to the limited experience of financial institutions in this type of transactions.
- The small average size of the vast majority of firms, which have little 'financial muscle'. This situation is aggravated by slow growth in sales in recent years, which limits the cash flow available for new investment.
- Recent changes in the Spanish regulatory framework, which directly or indirectly affect certain energies or technologies, have had a negative impact on the country's image abroad.
- The downturn in domestic demand due to the effects of the economic crisis, changes in the subsidy scheme for renewables and regulatory changes in electricity distribution and the gas system.
- Limited collaboration among cluster firms and between firms and technology centres. The most important cooperation projects involving various firms and technology centres (and the CRC Energigune) are in emerging technologies and areas, where there are not yet products or solutions that can be brought to market.
- The limited role played by the cluster association (ACE) in coordination and communication among cluster firms until just recently. There appears to have been an about-turn in this aspect since 2013.

The key challenges identified in the diamond are as follows:

Firms need to consolidate their market share and expand in foreign markets

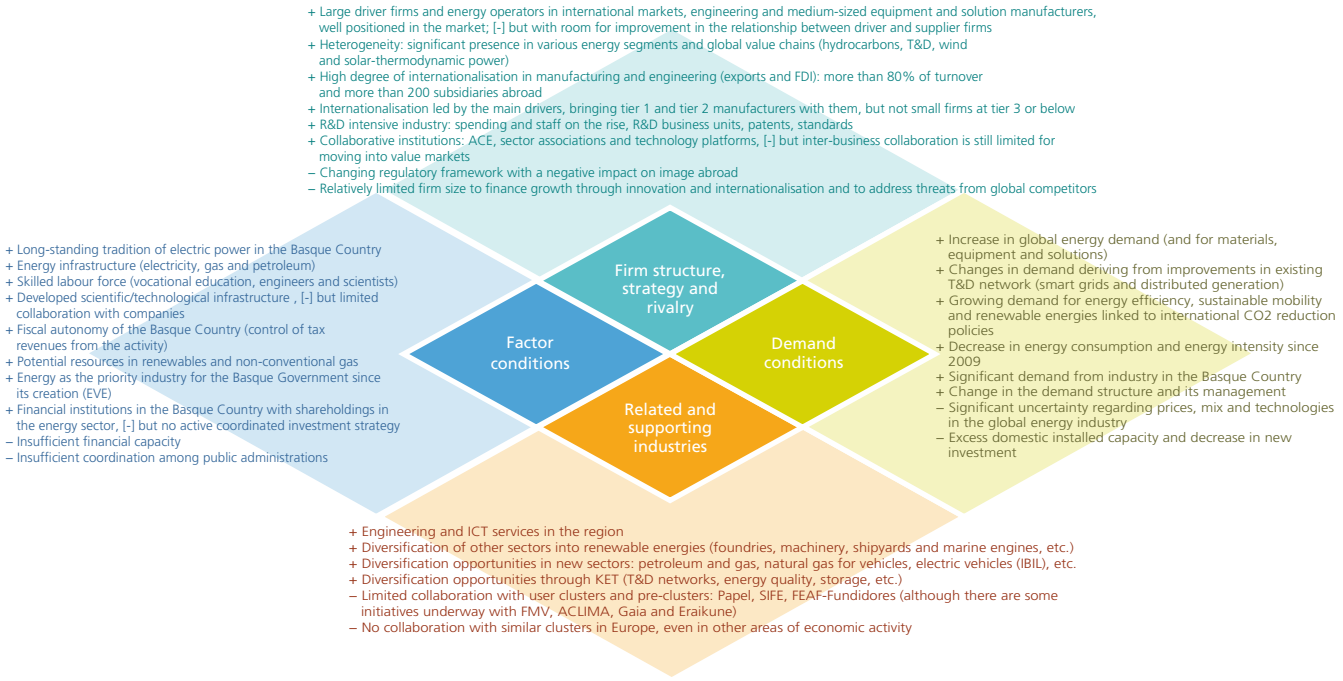
a) Cluster firms must strengthen their market share and, if possible, continue to grow in those segments and areas or value chains where they are already positioned (T&D, wind and solar thermoelectric), as well as in value chains where their current position is very weak (petroleum, gas and solar photovoltaic). They also need to position themselves in emerging segments and areas (wave power, storage). This growth can only occur in foreign markets through exports or by setting up subsidiaries abroad. Firm size and financial capacity are vital elements in this area.

b) Firms need to gain size and 'financial muscle' in order to move into emerging foreign markets, as they will need to undertake radical technological innovations and projects which require a long maturation period.

c) Innovation and technological change are another challenge for firms in the Energy Cluster. The slowdown in sales growth and decrease in public aid for R&D (and increased competition for this aid) make it more difficult to fund these activities.

d) Applying generic technologies or KET in all areas (especially in sensor systems, memories and product connectivity in all aspects of energy grids of any kind and in storage; and in new storage equipment and marine energy, as well as wave power and offshore wind power).

ILLUSTRATION 5 Diamond model of strengths and weaknesses for the Basque Country's Energy Cluster



Source: Compiled by authors.

e) Taking advantage of business collaboration opportunities within the cluster and with other clusters in the Basque Country and abroad. Noteworthy opportunities within the Basque Country include possible collaborations with clusters which group together user industries that are extremely energy-intensive (Papel, Siderex, SIFE, FEAF-Fundidores, among others) and with complementary clusters such as FMV (offshore wind power, wave power, and petroleum and gas), GAIA (ICT and energy efficiency), ACICAE (electric vehicles), ACLIMA and ERAIKUNE (construction energy efficiency). It is also possible to collaborate with clusters that complement value chains in the Basque Country's Energy Cluster. For example, Basque firms in the wind power industry could work with Scottish petroleum and gas firms for the offshore wind power industry; or collaborate with offshore wind power clusters in Denmark. Collaboration among clusters at the European level also has the advantage of access to European Union financing.

There is room for improvement in coordination of energy strategy at different levels

f) There is significant room for improvement in coordination of energy strategy at different levels. Firstly, there should be greater alignment between European Union strategies and those of member states (European Commission, 2015, p. 3). There has also been some movement towards improving coordination within the Basque Government (among different departments and agencies) and between the Basque Government and provincial councils, some of which are developing various initiatives in the energy industry.

The Energy Cluster offers the following paths to diversification:

- The predominant path to diversification in recent years has extended. In this area, opportunities have taken the form of the appearance of new sources of energy such as natural gas (and more recently, non-conventional gas) and renewable energies (wind, solar and biomass).

- There are also examples of diversification through the combination of capabilities and resources from various industries (cross-sectoral), although they are at the very preliminary stage, such as electric vehicles and natural gas for vehicles.
- The modernisation strategy (retooling) has been another constant among industry firms. Examples include the use of microelectronics or so-called key enabling technologies (KET) in the area of sensors, memories and connectivity for all products and solutions related to generation, grid connections, and energy transmission and distribution.
- There are also opportunities for new industries or sub-industries to appear (emerging) as a result of projects under way in hybrid generation and storage, as well as wave power.

In any event, we can anticipate that diversification opportunities for firms in the Basque Country's Energy Cluster in upcoming years will include the following:

1. The smart power grid value chain, linked to the European energy market, cross-border interconnections and distributed generation, among other things.
2. Growth in renewable energies — including wind, solar photovoltaic and biomass — in electricity generation and the overall energy mix.
3. Energy efficiency in industry, transport and construction.
4. Sustainable mobility and the use of other fuels such as electricity, biofuels and gas in transport.
5. Exploration and possible exploitation of non-conventional gas.

Basque firms must make the leap and take advantage of these diversification opportunities, forming the backbone of the supply side and gaining critical mass through collaboration amongst themselves or with third parties.

Other noteworthy aspects

Collaboration with other clusters, other regions and global value chains

The Energy Cluster has been involved in several collaboration initiatives between clusters

The energy cluster association (ACE) has played an important role in several initiatives and collaborative projects among clusters. The most numerous have been carried out together with the Basque Maritime Forum (FMV), although there have also been initiatives involving ACLIMA, the Basque Environment Cluster. Collaboration with the electronics and ICT cluster association, Gaia, has come about more due to the fact that a number of powerful electronics companies are members of both associations than to the existence of formal collaboration between the two associations.

In addition to those mentioned above, the energy cluster association has implemented collaborative activities with clusters or pre-clusters that group together firms that are energy consumers (Papel, SIFE, Siderex, etc.). It could also undertake collaborative activities with other clusters such as the automotive cluster (ACICAE) for electric vehicles, Gaia for power grids, and the construction (Eraikune) and home furnishings (Habic) clusters for energy efficiency.

To date, the Basque Country's Energy Cluster has not had more than sporadic relations with similar clusters in Europe. It could therefore intensify collaboration, especially with energy clusters which complement the Basque Country, such as petroleum and gas or offshore wind power in Scotland (Pérez Laborda et al., 2014), and offshore wind power in Denmark.

One of the strengths of the Energy Cluster is the existence of Basque firms positioned along several value chains. However, there is room for improvement in the structuring of the products and solutions offered by Basque firms in the various value chains.

Life cycle of the Energy Cluster, cluster policies and the role of RIS3

The Basque Country's Energy Cluster is organised around value chains with very different life cycles. Some are in mature industries (petroleum and gas — except for non-conventional gas — and T&D), where mechanisms for revitalising the industry come from change and modernisation of existing technologies, as well as the use of new technologies or new energy sources, such as non-conventional gas. Others, like the solar (thermoelectric and photovoltaic) and biomass value chains, although at different stages of development, seem to be in the emerging phase. Here there is room for improvement linked to technological development and firm learning curves. At an earlier stage are wave power, electric vehicles, storage and natural gas for vehicles, which can all be described as infant industries.

In addition to striving for balance and promoting the existence of clusters at different stages of development, public policies should be sensitive to variations in the development status of each of the value chains, rather than applying similar courses of action or programmes for all of them.

Within the Energy Cluster, cluster policy is considered a suitable tool for dialogue and mediation between the Basque Government and firms, among other aspects. Furthermore, its contribution is important when it comes to creating a shared vision and image for the country. Nonetheless, we have identified a need to reinforce ACE's role and expand it to take on new functions, such as seeking out new financing solutions for its members or, more generally speaking, promoting entrepreneurial discovery processes among members.

For its part, EVE is the body in charge of designing and implementing energy strategy and policy. Given the industrial implications of these, it is advisable to reinforce coordination and complementary aspects among all participating stakeholders, EVE, SPRI and ACE among them.

Advanced manufacturing in the Basque Country

Key stakeholders in the Basque Country

The advanced manufacturing priority can be described as a public policy platform or P3 (Cooke, 2012) which incorporates a large number of clusters and pre-clusters in the Basque Country. Therefore, advanced manufacturing is defined as a production activity capable of improving the speed, flexibility and precision of industrial production, increasing productivity and reducing consumption of energy and raw

materials. It is not linked to one or more specific industries, but can be applied to any industrial sector, regardless of its technological content (Walendoski and Rivera-León, 2014). The Basque Government has defined advanced manufacturing as an activity which focuses on creating new products, incorporating new materials and improving manufacturing processes (Basque Government, 2014, p. 17).

Current efforts relating to this strategy go beyond machine tools and attempt to place more emphasis on so-called user industries (aeronautics, automotive, etc.) and give a stronger role to other central solution providers (ICT, consulting, etc.). The reasons for the Basque Government's commitment to advanced manufacturing are rooted in the territory's economic/entrepreneurial and scientific/technological capabilities, as well as market opportunities. In fact, for the Basque Government, advanced manufacturing is the priority with the most developed and balanced entrepreneurial and scientific/technological capabilities in the Basque Country (Basque Government, 2014, pp. 18-19 and 31).

Advanced manufacturing is the priority with the most developed and balanced entrepreneurial and scientific/technological capabilities in the Basque Country

The Basque Advanced Manufacturing Platform is made up of:

- Science and technology stakeholders: universities, BERC, technology centres, CRCs and business R&D units.
- Industries that provide materials and primary processing solutions (foundries, iron and steel, forging and stamping), production resources and systems (machine tools, accessories, components and tools) and advanced services (engineering firms, ICT services, consultancies, etc.).
- Industries which are final users in the energy, transport (aeronautics, automotive, rail, naval), biosciences and other industries (electronics, home furnishings): generally OEMs and tier 1 and tier 2 manufacturers (DDEC, 2014; Basque Government, 2014).

The Basque Country therefore has scientific/technological capabilities and competitive advantages in the following industries: aeronautics, automotive, energy, machine tools, machinery and accessories, and other transport equipment (Reid and Miedzinski, 2014; SPRI-Basque Government, 2014).

In addition, within Europe, the Basque Country is among the group of technologically advanced European regions with a significant share of industrial activities (Walendoski and Rivera-León, 2014) and a relative degree of specialisation in the industrial and services industries most closely linked to advanced manufacturing.

Competitiveness diamond, challenges and opportunities for diversification in the Basque Country's Advanced Manufacturing Platform

The main strengths in the competitiveness diamond for advanced manufacturing in the Basque Country are:

- The Basque industrial legacy and tradition, as well as its relative specialisation in industry, as factors which generally support the expansion of advanced manufacturing in the region.
- The region has a good physical infrastructure and science/technology infrastructure with research that is highly focused on advanced manufacturing. This has re-

cently been joined by a validation and demonstration infrastructure for complex technologies (advanced manufacturing centres). The region also has skilled labour, supplied by universities and the vocational education system (engineers, technicians and programmers).

- The region has a good competitive position in industry — this can be seen in the recent growth in its relative balance of trade — and capacity for process innovation (automation, quality, efficiency), based on an ongoing commitment to R&D and considerable work in the area of technological adaptability.
- There are a large number of equipment and component suppliers from different tiers, which are relatively well positioned in global value chains headed by OEMs and highly internationalised. However, these suppliers depend heavily on OEMs which currently control and regulate the final product.
- The region has an industrial culture based on professionalism, efficiency and quality, with workers who are actively involved in production processes.
- The Basque Government has demonstrated its firm, ongoing, long-term commitment to industry.
- Industrial activity is highly clustered and there are cluster (and pre-cluster) associations for a large number of industries.
- Demand — largely international — for products and solutions is exacting and sophisticated in terms of the product itself (quality, environmental sustainability, traceability), but is not yet very open to the new services which could be incorporated into products.

Notable existing weaknesses include the following:

Limited financing, the Basque Country's geographic location and high energy and labour costs are notable weaknesses

- The Basque Country's geographic location — relatively distant from Central Europe and Southeast Asia (where the largest and most dynamic markets and the most important innovative activity in this industry are located) — and the existence of relatively high energy and unit labour costs.
- The relative lack of specific financing facilities, particularly for financing ICT services and solutions, investment in intangibles and launching new activities.
- The low number of firms with their own product.
- Minimal development of non-technological innovation, low levels of standardisation and the limited capabilities of firms to incorporate and integrate ICT into their value proposition, offer new services associated with the products and consider new business models.
- The absence of a culture of intellectual property rights and limited inward internationalisation, attracting very little foreign talent.
- Considerable dependence on OEMs, which regulate and control the specifications and features of the finished product.

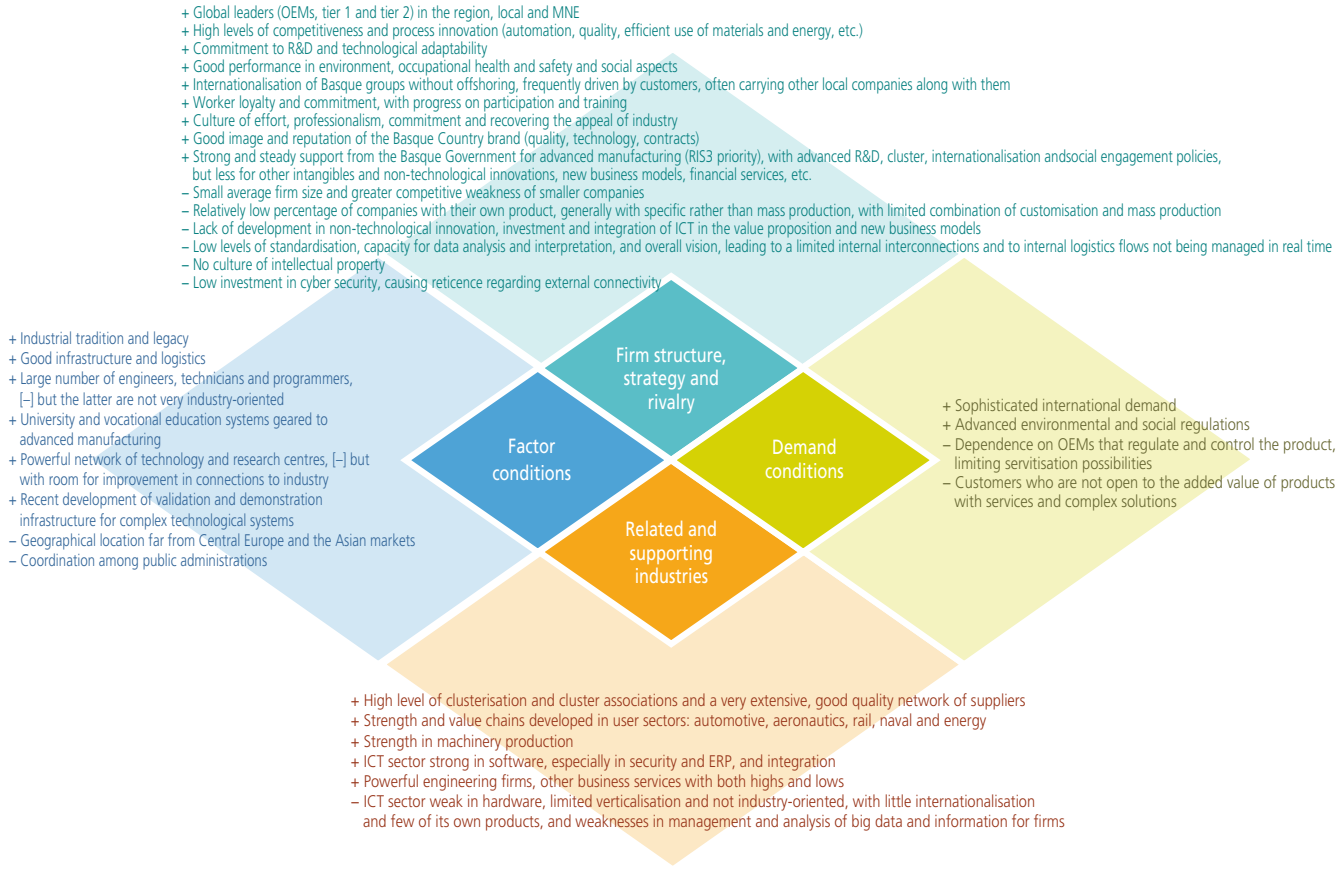
The Basque Country therefore faces a number of challenges (DDEC-SPRI, 2014, p. 59). Among the most noteworthy are:

- Energy efficiency improvements and reducing energy costs.

- Reducing manufacturing costs.
- Introducing product and process innovations related to KET.
- Design and development of firms' own new products.
- Integrating ICT into the entire production process and business, as well as the value proposition, and incorporating and exploiting new services added to products.
- Strengthening the shared infrastructures for demonstration and testing which have just been created in the Basque Country.

The small average size of Basque firms makes it difficult for them to tackle these challenges on their own. Therein lies the importance of intercompany cooperation.

ILLUSTRATION 6 Diamond model of strengths and weaknesses for the Basque Country's Advanced Manufacturing Platform



Source: Compiled by authors based on DDEC-SPRI (2014), the research underway on the expansion of industry 4.0 in the Basque Country (Sabalza and Navarro, 2015), and information from the cluster associations and pre-clusters concerned.

As regards to diversification opportunities, five priority areas have been identified. These were also selected for their potential to generate competitive advantages for industry by utilising KET (for further details, see DDEC-SPRI, 2014, pp. 69-71):

- Competitive and eco-efficient manufacturing.
- New materials and complex structures.

- Safe and intelligent means of production.
- Intelligent, collaborative and distributed manufacturing.
- New business models and high value-added services.

These five priority areas are broken down into 11 spheres of R&D&I and 32 lines of R&D&I, which offer a sort of road map for industrial diversification (DDEC-SPRI, 2014, pp. 72 ff.). Nonetheless, both the spheres and lines of R&D&I are highly focused on manufacturing processes, rather than on user industries or products.

Generally speaking, Basque firms see the expansion of advanced manufacturing as a generic KET, more like a gradual and natural process of evolution than something revolutionary or disruptive. It offers Basque firms several types of competitive advantages and diversification opportunities, depending on the different paths to diversification.

Advanced manufacturing technologies can facilitate diversification strategies based on the modernisation of existing industries

One, advanced manufacturing technologies can facilitate diversification strategies based on modernisation (retooling) of existing industries. From the perspective of user industries, adopting advanced manufacturing technologies can result in more efficient processes. This modernisation strategy does not alter the existing product and business, it simply offers a product with the same or higher quality at a lower cost. It can be applied to any industrial sector, but has particular impact on user industries (especially the automotive industry, but also other transport equipment and materials sub-industries and capital goods for energy).

Two, the expansion of advanced manufacturing technologies can result in the creation of new products and services, which may even yield new industries, if the size of the market is large enough. This strategy, called 'extending' in the RIS3 literature, utilises existing resources and capabilities, as well as similarities in the bases of knowledge between the original activity and the new one.

Three, the appearance of entirely new activities, although resting on a foundation of existing resources and capabilities, could be described as an emergence or radical foundation strategy. Online security, big data analysis and management firms and geo-information technologies utilising drones are examples in this area.

Four, with regard to the diversification strategy based on combining the capabilities and resources of several different industries to create a new industry (cross-sectoral), there are indications of opportunities, although still extremely embryonic, between firms in the ICT industry and capital goods manufacturers and OEMs, which may result in unique value propositions.

Other noteworthy aspects

Collaboration with other clusters, other regions and global value chains

The Basque advanced manufacturing strategic priority lays out a manufacturing community made up of industries and clusters, R&D&I stakeholders, institutions and a coordination agency within SPRI. It seeks to promote multidisciplinary convergence among the different stakeholders in the Basque Science and Technology Network, as well as a focus on transfer (DDEC-SPRI, 2014: 79 and 81).

Upgrading to advanced manufacturing concepts demonstrates the importance of promoting shared infrastructures in order to be able to develop, assess, verify and demonstrate the virtues of new concepts, with shared risk and investment costs which can be taken on even by SMEs.

Collaboration initiatives between advanced manufacturing clusters include collaboration between aeronautics and wind power, as well as two initiatives focused on incorporating ICT into production. Firstly, there is the collaboration between Gaia and those clusters whose activity is specialised in production processes, such as ACICAE, SIFE, FEAF-Fundidores and Siderex, in order to identify competitive advantages related to manufacturing processes. The second initiative may involve OEMs in the Energy, ACEDE, MAFEX and Eskuin clusters or even the Basque Biocluster, seeking to incorporate ICT into the value proposition for the products they manufacture. This may ultimately result in concepts such as extended product services and servitisation.

Shared development of R&D&I activities among the various clusters and RVCTI stakeholders or other science and technology stakeholders (for example, vocational education centres) is already taking place at a local or European level, although perhaps not in a very systematic manner.

The collaborative framework among clusters may be supplemented by promoting education and training, seeking to take advantage of all existing capabilities — not just those of educational facilities, but also latent capabilities within firms — to promote interdisciplinary aspects.

It is also noteworthy that firms, universities, and technology and research centres in the Basque Country are involved in similar platforms and organisations in Spain (MANU-KET), or at a supranational level in Europe (Manufuture, EFFRA). These represent collaborative spaces utilised to jointly respond to calls for R&D tenders.[12] In the Basque Country, intensive work is being done in the public-private sphere to enable the region to become a member of a European proposal led by the EFFRA (European Factories of the Future Research Association) to create a new added-value manufacturing KIC in 2016. Should this take place, it would mean that the Basque Country would become one of the five or six co-location centres for the future KIC and would be positioned among the most advanced European regions in this area.

Life cycle of industries and clusters, role of cluster policies and their relationship to RIS3

Due to the history of industrial development in the region, the majority of clusters and pre-clusters in the Advanced Manufacturing Platform have reached maturity. This is true for suppliers of materials and primary processing, as well as final users. In all cases, utilising KET and expanding advanced manufacturing technologies will make it possible to undertake adaptation, revitalisation and even transformation

[12] The UPV-EHU, Tecnalia, IK4, Margune CRC, and MCC and Grupo Innovalia business groups are all members of the EFFRA. Tecnalia and Grupo MCC currently have representatives on the board of directors of this association (http://www.effra.eu, last accessed 1 April 2015). Tecnalia and MCC, along with Ormazabal and Nicolás Correa, are part of the Manufuture platform, created in 2004 (http://www.manufuture.org/manufacturing/?page_id=744, last accessed 1 April 2015). Basque firms, technology centres and universities have a more significant presence in MANU-KET, the Spanish Technological Platform for Advanced Manufacturing (http://www.manufacturing-ket.com/manu-ket, last accessed 1 April 2015).

processes which may lead the cluster into a new stage of development or may result in the creation of new industries and clusters (Menzel and Fornahl, 2010; Valdaliso et al., 2014).

Public policy must be adapted to the development stage of each of the clusters in the Advanced Manufacturing Platform

Public policy in the area of advanced manufacturing must take into account the different stages of development of each of the clusters concerned (and even of the different value chains within each one), rather than applying similar lines of action or programmes to all of them.

Advanced manufacturing is among the priority areas most often chosen for RIS3 strategies by European regions (DDEC, 2014). Within the group of innovative entrepreneurial regions, which includes the Basque Country, it is advisable to promote cooperation among firms and stimulate joint cooperation among industry, universities and research centres. And lastly, it is necessary to locate and establish types of initiatives (priority areas) which promote advanced manufacturing (Walendoski and Rivera-León, 2014, pp. 25-27).

The Basque Country's inclusion in the Vanguard initiative has undoubtedly made it possible to conduct a proper regional benchmarking exercise and has helped with designing the advanced manufacturing strategy.

Another noteworthy aspect is the alignment among the Euskadi RIS3 Strategy, Industrialisation Plan, PCTI-2020 and 2020 Advanced Manufacturing Strategy.

The advanced manufacturing strategy makes provision for the creation of an Advanced Manufacturing Agency (to operate from within the SPRI) responsible for implementing strategy and policies, stimulating and coordinating the advanced manufacturing community, and monitoring and evaluating policies and actions (DDEC-SPRI, 2014, p. 97). In any event, unlike the existing agencies for the other two strategic priorities, this one does not yet have a defined structure and organisation.

One weakness of the advanced manufacturing strategy is its failure to include vocational education centres as science and technology stakeholders. In recent years, they have been implementing a wide range of collaboration and technology transfer initiatives in various areas of advanced manufacturing with SMEs (Asmaola and TKgune, to give two examples).

With regard to cluster policy, we see greater coordination between this policy and the advanced manufacturing strategy and Euskadi RIS3 Strategy. What is more, some of the aims of the advanced manufacturing strategy — including industrial improvements and scaling, and collaboration with other clusters in the Basque Country and other regions of the world — consider clusters to be priority instruments. We also see a change in the role of cluster associations as instruments of government policy and facilitators of cooperation among companies.

Innovative public procurement may represent an opportunity to improve the competitiveness of the industrial system

Lastly, to the extent possible, it would be desirable to utilise the capacity for innovative public procurement and regulatory possibilities in the areas of industry and the environment to promote interdisciplinary collaboration among the industry and improve its competitiveness.

Conclusions and recommendations for the future

The Basque Country increased its level of diversification during the crisis. As a result, its sectoral structure is now quite balanced, with a profile characteristic of an advanced economy. In particular, the services sector now represents a larger proportion of the economy. Within industry, manufactured goods with a higher level of technology and increased growth in demand have taken on greater importance. The sectoral structure of the Basque Country seems particularly sensitive to the current stage of the economic cycle. Therefore, if the expected economic recovery heralded by various indicators does in fact occur, the Basque economy could especially benefit from this.

The positive assessment which generally applies to the development of the sectoral structure may also be extended to the Basque Country's progress in the main competitiveness indicators. It is possible to draw the following conclusions from the sectoral analysis:

- Somewhat disruptive areas of focus, such as the biosciences, may make sense, although their impact can only be expected to be significant in the medium and long term.
- The relative commitment to energy is entirely justified in view of the values identified in the industries most directly linked to this area in the analysis carried out in that subsection.
- The relative weight and specialisation of the Basque economy in industries linked to advanced manufacturing are high. These industries also have positive characteristics in terms of wages, R&D, exports and other aspects. However, the analysis has highlighted that the values of the competitiveness indicators analysed for the advanced manufacturing industries are not so positive. It also reveals that the advanced manufacturing strategy, in addition to focusing on development of vertical initiatives (in other words, specific combinations of products, technologies and markets), should work to overcome the disadvantages which seem to persist for these industries in some factors of competitiveness.

In addition, the qualitative analysis of the three strategic thematic priorities for the Basque Country indicates that they have different characteristics. For this reason, strategies and policies intended to strengthen or support each one must take these characteristics into account. This is why there are different strategies and policies for each thematic priority. However, the thematic priorities also have common challenges, which strategies and policies must tackle together using horizontal instruments.

The strategic thematic priorities require different policies

In terms of distinguishing characteristics, it is possible to identify the following:

Firstly, as regards to organisation, advanced manufacturing can be considered a platform, whereas biosciences and energy are clusters. However, advanced manufacturing benefits from the extensive clustering in the Basque economy, although it is precisely this aspect which makes the platform more complex. At this time, the Advanced Manufacturing Platform needs the sort of unifying figure which an agency could provide. The absence of an agency reporting to the government is thus another difference among the three priorities.

The three priorities also differ in the maturity level of the value chains within the priority or cluster. Biosciences represents the most emerging cluster, whereas advanced manufacturing is the most mature. In the case of energy, it is possible to find more established businesses alongside others which are emerging or even infant industries. These differences in terms of maturity level, as well as other characteristics, lead to different areas of precedence in paths to diversification. These range from a preponderance of 'modernisation' in the case of advanced manufacturing to the prevalence of 'extending' among bioscience suppliers. In addition, at the early stages of a cluster's development, efforts must be concentrated in 'radical foundation'.

Despite the fact that the need to stimulate an increase in firm size is a common challenge in all three priorities, the weight and role of large firms and SMEs is different in each case. Thus, in the case of energy, the cluster has large firms and economic drivers, world leaders. The greatest problem with size can be found in the manufacturers group. In the case of biosciences, small and medium-sized enterprises have been the main stakeholders in the cluster. They face the problem of increasing in size in order to continue playing this role in the region, as well as to compete internationally. Lastly, despite the fact that advanced manufacturing in the Basque Country also includes large firms that can exert a pull effect, these are frequently dependent on large global companies which control the finished product, brand or distribution (OEMs). In addition, in this priority, the Basque industrial legacy has left a larger number of small firms distributed throughout different clusters. They therefore require more structure around different value chains in order to diversify.

However, there are also common characteristics which can be approached jointly, namely:

All three priorities have the shared characteristic of requiring extraordinary financing facilities

Despite differences in the size and function of each type of firm, in all three cases the analysis has determined that the need for extraordinary financing facilities (for company acquisitions, internationalisation, R&D activities, etc.) is a constant for business development and productive transformation. Consequently, venture capital, active and coordinated management of industrial portfolios by Basque financial institutions and innovative public procurement, among other things, may be common to the three priorities and even support emerging areas of development outside of them. The particular aspects of the most ideal policies and instruments for each one should be taken into account when implementing individual strategies.

The Basque Country has specialised knowledge infrastructures in the three priorities. Among other things, this is due to the fact that the Basque Government, primarily, and other government bodies have allocated resources to producing these capabilities. However, limited collaboration between these knowledge stakeholders and firms, particularly SMEs, continues to be a major common weakness of the system. This goal of forging connections has been partially undertaken with the restructuring of the RVCTI, as it does not include stakeholders such as vocational education centres, for example, although they are key to advanced manufacturing. However, this collaboration and connection among the different stakeholders must also be approached on an individual basis for each case, as each priority requires different types of knowledge. Thus, for example, the biosciences use more scientific knowledge than is generated by CRCs and universities. In contrast, advanced manufacturing requires more technological or engineering knowledge than is found

in technology centres (as also happens with energy, which shares a strong element of business R&D&I) and vocational education centres, among others.

Collaboration between clusters is a constant challenge in all three priorities, although in the case of advanced manufacturing, it is an overarching need, due to the high degree of fragmentation and clustering contained within the priority. This is also true for biosciences in order to make diversification possible, allowing firms in traditional industries to move into the bio and health care industry as suppliers or users. This challenge will be approached via the new configuration for the cluster policy.

Lastly, in all three spheres, it seems necessary to improve coordination among the different institutions, government departments and agencies, creating a sustainable strategy and leadership. This entails a reorganisation of public administrations based on the concept of innovation in the public sector.

Innovation in the public sector is necessary for priority strategies and leadership to be sustainable

In addition to the preceding, it is possible to identify the following specific conclusions and recommendations for each cluster or priority:

In the bioscience industry, there are several challenges facing the Basque Biocluster:

- One, ensuring that all components of the biocluster begin to interact and truly function as a system. This is not just a matter of each component interacting more closely with the others (for example, science and technology infrastructure with biotech companies), rather, the members of each component must cooperate and exploit synergies and complementary aspects (for example, CRCs and technology centres), instead of operating as isolated elements.
- Two, it is necessary to mention the coordination and interaction within the government. The biocluster requires government support and intervention in multiple areas. This means that a number of departments or institutions from the same government, or even different levels of the government and territory, must be involved. As the cluster has developed, new definitions have emerged, without there being one clear definition and coordination of goals, roles or mandates. Additionally, the progress rate of new instruments and policies needed by the cluster is lacking. There is a risk that no institution will view the cluster a specifically theirs and will not be willing to invest the resources and time necessary to build shared leadership. This RIS3 thematic priority would fall behind as a consequence.
- Three, it is necessary to address the management and business development capacity needs of Basque biotech companies, as well as taking on the challenge of growth and attracting private capital, which must to a large extent be international.
- Four, following the stage during which it was necessary to create capabilities, both scientific/technological and business, it is now necessary to focus and further concentrate initiatives in the bio industry.
- Five, interaction and connectivity must not be limited to components of the Basque Biocluster. Rather, it must interact and connect with the other clusters and collaborative institutions in the Basque Country (among other things, to facilitate links between firms within them and the bio and health care markets, as suppliers and users). The same must be done with similar clusters in neighbouring regions

(especially Navarre and Aquitaine, which also have relatively developed and complementary bio strategies) and connected to global value chains (as production in this area can usually only be sustained by global demand).

Regarding the Energy Cluster, the most noteworthy challenges are the following:

- One, as regards to public policy, there is a need for greater coordination among institutions (Basque Government and provincial councils), among different agencies and other intermediate organisations (EVE, SPRI and ACE), among government plans and strategies (RIS3 Strategy, PCTI-2015, 3E2020) and with other energy strategies for the EU, in other member states or regional strategies in the energy industry. In the sphere of cluster policy, due to the existence of different value chains with differing life cycles within the Energy Cluster, it will be necessary for policies to seek balance and promote chains at different stages of development.
- Two, given the established need to achieve and maintain a certain size and level of financial muscle at firms in the Energy Cluster, one important challenge is increasing firm size, enabling companies to improve their technical capabilities and economic/financial resources, either through mergers and acquisitions or partnerships.
- In addition, with regard to value chains in the Energy Cluster, it would be beneficial to incorporate local suppliers and strengthen the position of Basque firms in each of their value chains. It would also be advisable to improve their position in emerging value chains with future possibilities. Another recommended area of focus is business participation in industry associations and national and European technology platforms.

It is advisable to integrate local suppliers into Energy Cluster value chains

- Lastly, one pending challenge is collaboration among clusters within and outside the Basque Country. To promote this collaboration, it is necessary for the cluster association ACE to move forward in this area and adapt to meet the demands of its members.

The advanced manufacturing priority also faces a number of challenges:

- Firstly, in comparison with activities in the other two priorities (biosciences, which is highly disruptive and has a scientific foundation; and energy, with a greater capacity for the emergence of new value chains and areas of diversification), activities in advanced manufacturing have been more 'based on the present'.
- What is more, unlike the other priorities, for which it is possible to identify a number of value chains within one large cluster (biosciences or energy), in this priority there is a profusion of clusters and cluster associations, which means that we must instead speak of it as a platform. Therefore, while in any area of economic activity, cooperation and interaction with other units and stakeholders is a source of competitiveness which cannot be ignored, this is even more true for businesses which operate or are organised as platforms. The relative organisational simplicity of the other strategies makes it possible to see more clearly who should assume the role of facilitator for the process. In contrast, in the Advanced Manufacturing Platform, the profusion of organisations, clusters and pre-clusters, along with the absence of a specific government agency for the platform, means that this clarification and subsequent restructuring process (for example, grouping or develop-

ing agreements between the existing organisations) becomes one of the first tasks which must be undertaken. Only then will it be possible to move forward in a more orderly manner with the process of cooperation and integration among the different value chains and clusters.

- In this area, the main challenge facing Basque firms does not seem to lie so much in overcoming a lack of technological development or closing a gap, but in incorporating ICT, new business models and servitisation processes. For a great number of Basque firms, the major problem is that they lack their own products and occupy a weak, highly dependent position in global value chains.
- To a large extent, this relates to the problem of firm size. This must be tackled either through mergers and acquisitions or through cooperation among companies and clusters. In this regard, it is crucial for cluster associations to create spaces or mechanisms through which the experience and position of Basque firms situated at the higher levels of global value chains can be communicated to SMEs in order to facilitate an improvement in their position or even their migration to other chains. Additionally, especially considering the needs of SMEs, it would be advisable to incorporate vocational education centres into the Science. Technology and Innovation Network.

Advanced manufacturing has a problem in terms of firm size

Lastly, the analyses of the different priorities also offer a number of lessons or conclusions regarding how to move forward with productive transformation strategies.

The first of these is that the regional strategy must include a set of commitments in which there is a balance — which of course changes from one region and situation to the next — between long-term commitments supported by the development of new activities (or a path to diversification based more on radical foundation) which are more disruptive and science-based in nature, with less of a short-term economic impact; and other types of commitments more rooted in the current economic and business situation, involving more incremental transformation (or a path to diversification based more on modernisation) supported by synthesis and engineering, with greater impact in the short and medium terms.

The second lesson is that the role of the government in creating these advantages may vary a great deal from one cluster or priority area to another in terms of both intensity and form. Thus, for example, the level of involvement required to develop a cluster like the Bioscience Cluster is clearly greater than that required by advanced manufacturing. This level of intervention will also vary between regions. This is not only because some areas can build on different foundations (for example, the existence of strong universities, large pharmaceutical companies and less risk aversion) which make their development more natural and spontaneous, but also because regulatory powers, institutional quality and government capacity to make good use of them vary from one region to the next. What is more, within a given region and a given cluster, the level and type of government intervention required is different. Thus, for example, although the early phases of the Basque biosciences strategy could be managed by the Department of Industry almost single-handedly, today the level of intervention required exceeds the powers of this department and there is a need for significant involvement by other departments and institutions, as well as many and more varied instruments.

The Basque experience in biosciences shows that there is no one standard model for the entrepreneurial discovery process

The third main lesson to be taken away relates to an extremely key aspect for smart specialisation strategies: entrepreneurial discovery processes. In this area, the Basque experience in the biosciences shows that there is no one standard model for the entrepreneurial discovery process. Rather, that the diversification and improvement processes which these seek to develop occur in very different ways, even within a given priority. In fact, a given priority or cluster may actually conceal very different value chains which require quite dissimilar entrepreneurial processes and entrepreneurial discovery. Furthermore, even within one of these chains, the logic of the entrepreneurial discovery may be quite different: in some cases it may be more driven by science (science-push model) — as when the idea for the new activity or product emerges from the academic world — or it may instead be the result of an attempt to respond to a need on the demand side (demand-pull model). Additionally, the entrepreneurial discovery process may also vary depending on the path to diversification chosen: radical foundation requires different types of activities than expansion, combination, etc.

Section IV.
The territorial dimension

This region was ignored for a long time by conventional economics, which seemed to consider that economic activities can be developed in a world irrespective of space. However, at the end of the 1980s, a series of major authors from different perspectives[13] adopted trends such as economic geography and regional and urban economics, which from the first were already stressing the essential role that space plays in the innovation and competitiveness of the actors operating within it. The economy does not work isolated from institutions, but rather is embedded in them. And institutions, like history, are inconceivable without space.

Although at first analysts focused their attention on the national arena, later, as studies began to reveal the importance of microeconomic aspects for competitiveness, and especially the importance of innovation, their interest started to move towards sub-national scenarios. This occurred, among other things, because it is thought that for tacit knowledge to flow from one stakeholder to another, proximity is necessary. Moreover, analysts determine that, even though they may share the same national institutional framework (such as the same regulations for the labour market or financial system), there are often more significant differences between one region and another within a country than between different countries. They therefore deduced that members or components at the regional level have something to do with these differences.

Proximity is necessary for tacit knowledge to flow from one stakeholder to another

However, even though it may make sense to try to record and identify factors that, while belonging to the regional level, are also underlying factors for inter-regional differences, and even to try to deliberately affect the development of the regional innovation system, what is universally criticised is the belief that a regional innovation system is a national innovation system on a smaller scale. Or, similarly, trying to design regional strategies and policies without a multilevel perspective. It is not economically justifiable to try to organise certain aspects of a national innovation system on a regional level. As for regional strategies and policies, they must be coordinated with and complement those at other levels, and not be established without taking them into account or overlapping with them. However, it is certainly true that not all regions have the same history, aspirations, competencies and capabilities, and in this sense there is no perfect or ideal regional innovation system to which the regions should be held, nor any completely predetermined competency frameworks that must not be exceeded. Similarly, coordination must be understood as a whole, and not simply as development by lower level policies of those that have been independently established at higher levels.

Thus, recent decades have revealed the discovery that economic activity takes place within a space, and that space is not limited to the national arena, but that beneath it there lies a plural and diverse regional reality that must be taken into account when designing development, competitiveness and innovation policies. However, in contradiction to the logic that has guided this process, when we drill down to the situation at a regional level, once again, space and the territorial differences seem to disappear from the analysis and policies, and the region is treated as a homogeneous, ultimate reality. This, however, is incorrect. Even in a regional innovation system as developed and prototypical as that of the Basque

[13] Porter, based on management literature with his book *The Competitive Advantage of Nations*; Krugman, from conventional economics and international trade, with *Geography and Trade*; Nelson and Lundvall, from innovation economics, with *National Systems of Innovation*: *A Comparative Study* and *National Systems of Innovation. Towards a Theory of Innovation and Interactive Learning*, etc.

Country, it does, in fact, feed on diverse historical territories, and in each of them, there is also a rich plurality or mosaic of counties and municipalities. There should be an awareness and consideration of this perspective, both when designing the policies that correspond to higher territorial levels and for those that would like to gain momentum from the lower levels. Yet, again, recognising that these different contexts at the sub-regional level exist and that development strategies and policies should take them into account does not mean that the local system should imitate or try to be a smaller version of a regional innovation system. Neither does it mean that strategies or actions proposed at one level should ignore existing strategies and policies at higher levels.

It is vital to know the territory in which the productive transformation is taking place

To summarise, since all economic and productive transformation activity is determined by the territory in which it takes place, expertise about the territory is vital, both for the strategies and policies that are developed at higher levels (but that affect the territory or have an impact on it) and for the strategies or actions to be set in motion at the territorial level itself. This section is intended to provide a response to that need for expertise about the territory where productive transformation processes occur.

The first subsection contains a competitive analysis of the three historical territories that make up the Basque Country: Álava, Gipuzkoa and Bizkaia, with a similar model to that used for the Basque Country as a whole in the first section. There are therefore four groups of indicators used for the competitive analysis. One: indicators that reflect the productive structure or the foundations of the historical territory (basically, size, ownership and structure of the industry). Two: determinants of competitiveness (expenditure and cooperation in innovation, etc.). Three: intermediate performance indicators (exports, productivity, unemployment rates, etc.). And four: final outcome indicators (GDP per capita, long-term unemployment, etc.).

The second subsection of the analysis looks at the municipal and regional levels. Since the number of municipalities and counties in the Basque Country is relatively high and their analysis would be too extensive for this report, we have decided to identify and characterise typologies of municipalities and counties. To do this, after constructing a base with 25 competitiveness indicators for each municipality in the Basque Country, municipality and county typologies were identified through a series of statistical analyses (factor and cluster), and what type of variation the different types experienced during the crisis was analysed.

The territorial dimension

Why it is important for productive transformation

The Basque Country is not uniform, which is something that any initiative or policy at different administrative levels conceived to affect the competitiveness of the territory should consider in its design. Furthermore, it should take into account that these initiatives or policies will impact different fields in a variety of ways. What is more, a number of different stakeholders interact within the territory, and they may have different and sometimes opposing perspectives on what the main problems facing the territory and their possible solutions are.

In the Basque Country, the Basque Government, provincial councils and municipalities (some of them with regional development agencies) are all defining and developing their own initiatives for improving competitiveness. In these initiatives, they should look for complementary and compatible areas within the guidelines proposed at other institutional levels and the perceived needs in their own spheres of action. In such a complex regional situation, improving competitiveness involves building dialogue, seeking agreements among the different levels of government and public administrations, and constructing shared visions.

Improvements in competitiveness are built on processes of dialogue

This requires an ongoing analysis of territorial diversity that would allow us to understand why others are adopting the strategies they are choosing and how we can find areas for collaboration. Therefore, the analysis of territorial diversity is used to identify the situation in each territory and not to support only local initiatives, but also those of the supra-local governments that seek territorial cohesion in the area of competitiveness and economic development, in accordance with the maxim that regional policy must be adapted to its context.

The current situation in the Basque Country

Analysis of the historical territories

Table 8 shows the most significant results of the analysis of the differences between the three historical territories in two different years (2008 and 2013), with regard to the different factors of competitiveness grouped according to the conceptual framework presented above. The colours indicate the position of each historical territory with regard to the rest (green indicates the best position and red the worst).

Each historical territory has a different specialisation

With regard to endowments, the results show three different historical territories, especially in relation to specialisation (both in terms of GVA and with regard to exports). In fact, the indicators used show that Álava is the most industrial territory — as almost one-third of its GVA comes from industrial manufacturing, mainly medium-tech manufacturing — and specialises in exports of durable consumer goods (growth in demand for which is not high) and in intensive manufacturing with economies of scale and regional processing. Its industrial employment is mainly centred on medium-sized firms. It is the historical territory where firms with foreign capital have the greatest relative weight and in these firms, there have been lower

TABLE 8 Summary of analysis data for the historical territories

		2008			2013		
	Indicator (unit)	**Araba**	**Bizkaia**	**Gipuzkoa**	**Araba**	**Bizkaia**	**Gipuzkoa**
Endowments	Average size of all industry (no, of employees)	20.59	16.51	15.73	15.33	16.97	15.41
	Average size of all business services (no, of employees)	3.39	3.99	3.89	3.59	4.04	3.57
	Firms with foreign capital in the territory (**) (% of all firms)	1.90	1.22	1.29	1.87	1.11	1.15
	Cooperatives in the territory (**) (% of all firms)	1.22	0.78	1.30	0.98	0.52	0.87
	GVA in industry (% of total GVA for territory)	34.82	22.82	32.18	31.50	18.72	28.19
	GVA in market services (% total GVA for territory)	32.32	43.20	34.89	34.74	46.71	37.81
	Economic use of durable consumer goods (export specialisation index)	323.95	63.94	106.52	254.70	69.83	90.80
	Economic use of intermediate consumer goods (export specialisation index)	109.72	184.82	120.01	102.97	165.86	103.76
	Economic use of capital goods (export specialisation index)	52.88	58.91	171.07	49.22	77.92	181.36
Determinants of competitiveness	GVA/turnover in industry (*) (%)	27.12	23.44	31.82	24.76	21.56	30.59
	Firms that cooperate in innovation (% of all firms)	10.51	13.33	10.81	11.64	16.43	18.43
	Innovation expenditure (% of sales)	2.82	1.68	2.77	3.06	1.91	2.77
	Expenditure on machinery (% of innovation expenditure)	44.62	20.23	20.10	46.20	9.08	13.74
	Expenditure on external R&D (% of innovation expenditure)	20.02	15.68	13.14	17.50	24.33	14.81
	Total R&D expenditure (% of GDP)	1.43	1.71	2.18	1.63	1.84	2.41
	Vocational education students (aged 15-24) (% of 15-24 pop.)	13.11	11.75	13.23	21.83	16.65	17.73
Intermediate performance	Innovative firms (% of all firms)	50.58	44.00	48.94	41.02	43.68	49.72
	Firms with non-technological innovation (% of all firms)	29.12	24.38	31.93	17.74	19.28	22.92
	Firms with product innovation (% of all firms)	18.61	21.34	23.33	25.35	23.42	28.14
	Exports/inhabitant (thousand €)	17.63	7.11	9.63	16.56	7.58	9.34
	New sales for the company (% of total sales)	3.82	3.20	9.17	14.31	8.72	16.88
	New sales for the market (% of total sales)	1.96	2.88	4.14	2.36	3.95	6.08
	GVA per employee (*) (thousand €)	62.50	60.69	60.81	64.45	63.88	63.98
	GVA per employee in high-tech manufacturing (*) (thousand €)	92.01	48.85	55.51	95.79	57.36	64.99
Final outcomes	GDP per capita (thousand €)	37.11	30.64	32.93	33.24	29.25	30.83
	Long-term unemployment (%)	0.30	1.20	0.70	7.70	9.40	6.50
	Absence of wellbeing (%)	6.50	10.10	5.70	15.30	12.80	7.70

Source: Eustat. Eurostat. AEAT (Inland Revenue). Comtrade, OCDE REGPAT. Complied by authors.

(*) 2012 Data.
(**) 2014 Data.

Best position among the three historical territories
Middle position among the three historical territories
Worst position among the three historical territories

job losses than in other firms in the territory. On the other hand, cooperatives do not have very significant weight, although this has been increasing since the beginning of the crisis.

Bizkaia, on the other hand, is the territory with the greatest specialisation in market services such as telecommunications, financial activities and consultancies. Within manufacturing, its specialisation is in medium-low-tech and its exports include intermediate goods (petroleum refining, iron and steel, electrical materials and equipment) and intensive exports of natural resources. Employment is concentrated in large firms (34% of total employment). In fact, it is the territory with the largest firms both in industry and in services.

Gipuzkoa is a territory with a high percentage of production from the industrial sector, specialising in metallurgy and metal products, machinery and equipment, paper, electrical equipment and computer and electronic products. Compared to the other territories, it specialises more in higher-tech manufacturing and equipment. This also translates into its exports, which are characterised by a higher level of technology, focusing mostly on capital goods (machine tools, railway equipment, etc.) and by being intensive in differentiation and in global innovation industries for local markets. The highest percentage of industrial employment is in large firms. Cooperatives have greater relative weight in this territory.

The determinants of competitiveness include aspects related to performance and the business environment of firms in the three territories.

Álava stands out as the territory with the highest percentage of innovation expenditure in the industry and because most of that expenditure comes from purchases of machinery and equipment. This is probably related to the greater weight of firms with foreign capital in its economy. In the Basque Country, these firms are characterised by an orientation that is less directed towards R&D and more towards high physical capital endowments. It is also the territory where the indicators relating to human capital (population in continuing education, tertiary education and vocational education) have improved the most, although this may be the result of the somewhat lower level it had at the outset, as well as its higher unemployment rates (which encourage people to extend their education).

Álava stands out as the territory with the highest percentage of innovation expenditure in the industry

Industrial firms in Bizkaia tend to have a low level of internationalisation. This may be related to its specialisation in natural resource-intensive firms — which do not include much added value in production — and firms offering business services (engineering, consulting, etc.). As in Gipuzkoa, much of the innovation expenditure in this territory corresponds to R&D activities, including those of external R&D. Bizkaia stands out for cooperating in innovation with other EU stakeholders more than the other territories. On the other hand, when it cooperates with R&D agents, it does so in greater proportion with universities.

The greater presence of cooperatives in Gipuzkoa may be related to the high level of internalisation of its industry and also to the fact that a greater proportion of expenditure on innovation corresponds to R&D, especially that of an internal nature. Even so, it is the territory with the greatest tendency towards cooperation with other stakeholders in the territory on innovation, especially with technology and research centres.

Firms in Gipuzkoa cooperate more with science and technology stakeholders

With regard to intermediate performance indicators, Álava still maintains the best levels of productivity and exports (which relate to its greater industrial specialisation), although the territory has seen slower growth of these indicators. The decline in exports has been marked by the fall in exports of transport equipment (particularly automotive) and metallurgy products. Despite being the territory that percentage-wise spends more on innovation, it also has a lower percentage of innovative enterprises, especially in the segment of small firms. In large firms, on the other hand, it outperforms Bizkaia and Gipuzkoa.

Bizkaia, for its part, has the worst intermediate performance levels of all the territories in terms of rates of productivity, exports and patents per inhabitant, which may be due in part to the lower weight of its industrial sector. It is also the territory with the lowest percentage of sales of innovative products. On the positive side, it should be noted that it is the only one of the three provinces where exports increased between 2008 and 2013. Specifically, shipbuilding and refined petroleum grew, helping to offset the fall in exports of metallurgy products.

Bizkaia is the only territory in which exports have increased

Gipuzkoa is the territory with the highest percentage of innovative firms and highest percentage of innovative, new sales both for the company and for the market. Intermediate performance indicators showing a drop in exports are also noteworthy, with exceptions in some significant industries in the territory, such as machinery and equipment.

Lastly, Álava is the territory which has had the worst performance with regard to final outcome indicators. While still maintaining the highest GDP per capita, a considerable percentage of the population is experiencing long-term unemployment and lacks the resources which are considered minimum to participate normally in society. Bizkaia, on the other hand, started out in 2008 from the most disadvantageous position both in economic outcome indicators (GDP per capita) and social indicators (long-term unemployment and risk of absence of wellbeing). Since then, these indicators have worsened, but with a lower rate of negative variation than that of the other two territories. Gipuzkoa, on the other hand, has been better positioned than the other two territories in social indicators, with lower long-term unemployment and risk of absence of wellbeing than Álava and Bizkaia.

Municipality analysis

Based on a factor analysis with data from prior to the crisis and updated data, four factors have been obtained for the 25 variables selected and 251 municipalities in the Basque Country. These four factors don't vary a great deal if the different data from the two years analysed are taken into account:

1. The first factor or axis includes the characteristics associated with *high-tech manufacturing activity*.
2. The second factor corresponds to *agriculture and fishing activity*.
3. The third factor is *foreign population and unemployment*.
4. The fourth factor corresponds to *competitive and innovative performance,* as the most characteristic variables are GDP per capita and R&D activity.

The latest data yielded the following typology for municipalities:

Through a sectoral analysis a typology for municipalities is obtained

Group 1. Municipalities specialising in manufacturing

These are municipalities with greater specialisation in the manufacturing industry and, therefore, with a higher concentration of employment in industry and energy. This specialisation is reflected in the high percentage of the population working in the durable consumer goods industries and in capital goods and intermediate goods industries. It is worth noting that these municipalities have the highest percentage of population with vocational education. Although the percentage of employment at the high- or medium-high-tech level is greater in other municipalities, the percentage of high- or medium-high-tech manufacturing firms or the percentage of firms with R&D is lower than Group 2.

Group 2. Municipalities with high technology level manufacturing, services and a favourable situation

This corresponds to a small group of municipalities (mainly in Bizkaia) that stand out as having the highest percentage of high-tech and medium-high-tech or knowledge-intensive manufacturing firms. In addition, in comparison with Group 1, they have more services (in terms of employment and enterprises), including knowledge-intensive services. A higher percentage of the population has also completed tertiary education. These municipalities have the highest rates of GDP per capita in the Basque Country, the lowest unemployment rates and better transport links. Also noteworthy is the low percentage of foreign population in comparison to the other groups of municipalities.

Group 3. Small municipalities specialising in agriculture with an unfavourable situation

This group of six small municipalities in southern Álava is noteworthy for its concentration of employment in agriculture. However, in comparison with Group 4, its situation is unfavourable. Unemployment and dependency rates are higher than in any other group of municipalities, and the level of training is also lower. The degree of agricultural industrialisation and the technology level of productive activity are limited. Similarly, its services sector is the smallest of all the groups and poor transport links are an obstacle to improving its competitive performance.

Group 4. Small municipalities specialising in agriculture and fishing

This large group is located in all three provinces, particularly in Álava. Its expertise in agriculture and fishing stands out in comparison with other municipalities. Although its levels of unemployment and income are not entirely favourable, increased levels of training, improved transport links and proximity to municipalities with greater economic activity mean that in some cases, its situation is more favourable than the municipalities in Group 3.

Group 5. Large municipalities with greater specialisation in services

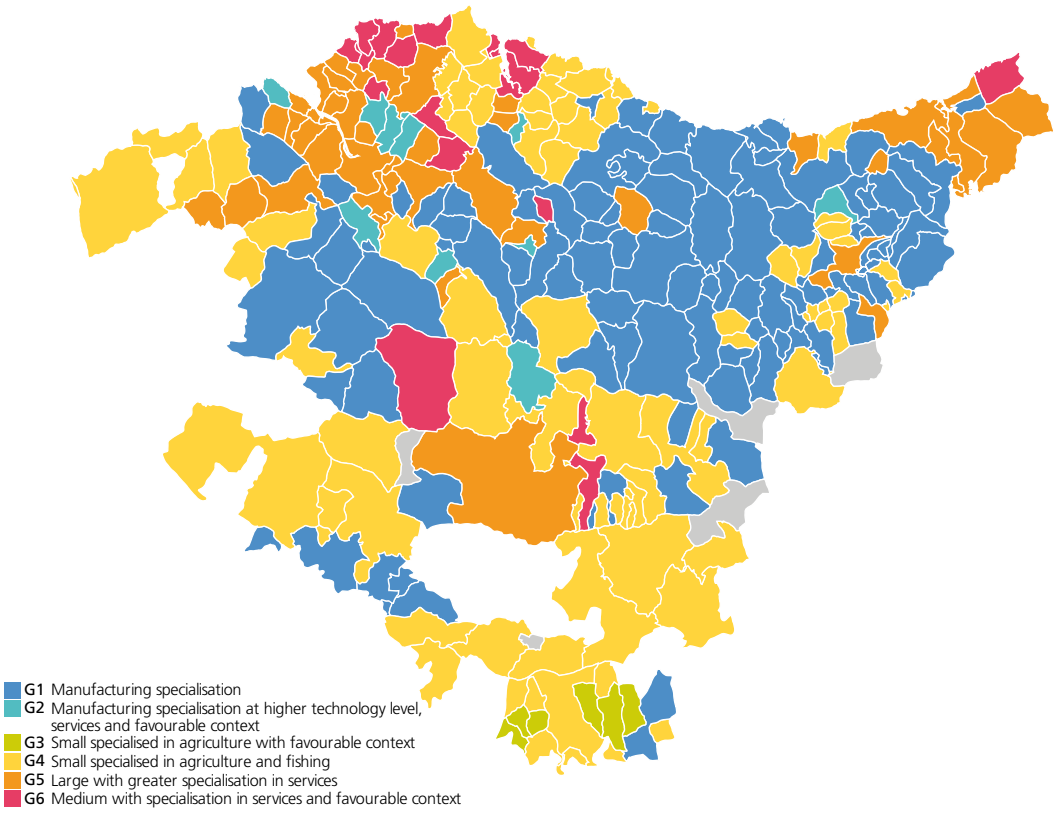
This group is composed of larger municipalities, including the three provincial capitals. Many of those which are not capitals are also located in their metropolitan

areas. Their demographic density and good transport links can be highlighted. Most of the employment in these municipalities is concentrated in the services sector, with a high percentage of the population working in business services and knowledge-intensive enterprises.

Group 6. Medium-sized municipalities specialising in services with a favourable situation

These are municipalities specialising in the services sector with almost no industrial activity. They are noteworthy for a high percentage of the population with tertiary studies, low rates of dependency and income and unemployment levels that reflect a more favourable context in comparison with Group 5. In terms of location, Map 3 indicates that the majority are located in the centre-north of Bizkaia.

MAP 3 Groups of municipalities in the Basque Country



Municipalities in the Basque Country have suffered a loss of specialisation, particularly those specialising in manufacturing, agriculture and fishing

Comparison of these data with data from analyses carried out prior to the crisis indicates that municipalities in the Basque Country have suffered a loss of specialisation, particularly those specialising in manufacturing, agriculture and fishing.

Basque municipalities continued to specialise in services despite the crisis

It can also be noted that the specialisation in services largely remains in the same municipalities as in the pre-crisis period. This confirms that this specialisation is due more to the loss of activity in industry, agriculture and fishing than to an increase in the services sector. It is likewise noteworthy that, although many municipalities maintain their specialisation in services from the pre-crisis period, their unemployment rate and income levels are currently worse. This situation is repeated in the case of manufacturing.

County analysis

Four factors are obtained from the factor analysis with different variables for the Basque counties (both pre-crisis data and current data):

- The first factor corresponds to the characteristics associated with *high-tech manufacturing activity*.
- The second factor corresponds to *traditional consumer goods industries and agriculture and fishing activities*.
- The third factor relates to *income level and innovation*.
- The fourth factor relates to *educational level and county connectivity*.

A cluster analysis with automatic classification was carried out using the latest data, from which four groups of counties were obtained (Table 9):

TABLE 9 List of counties belonging to each group

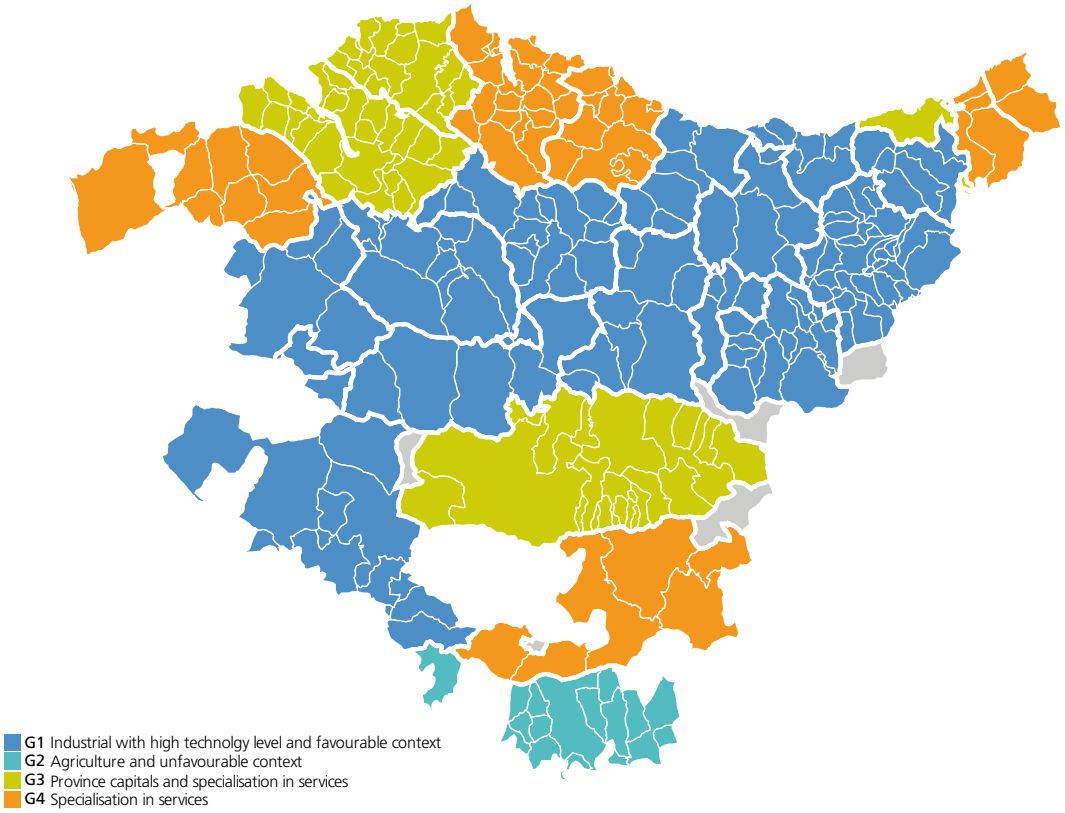
Group 1	Group 2	Group 3	Group 4
Arabako Ibarrak	Errioxa Arabarra	Arabako Lautada	Arabako Mendialdea
Arrati Nerbioi		Bilbo Handia	Bidasoa Beherea
Buruntzaldea		Donostia	Busturialdea
Debabarrena		Uribe	Enkartazioak
Debagoiena			Lea Artibai
Durangaldea			Oarsoaldea
Goierri			
Gorbeia Inguruak			
Kantauri Arabarra			
Tolosaldea			
Urola Erdia			
Urola Garaia			
Urola Kosta			

Group 1. Industrial counties with a high technological level and favourable situation

This is the largest group of counties and forms a central belt in terms of location (see Map 4). Specialisation in manufacturing is its main feature. These counties have the highest percentage of high- or medium-high-tech manufacturing firms and the highest percentage of enterprises with R&D activity. Similarly, unemployment rates are lower and the highest average personal income is found here. The population with vocational education is greater than in the other groups and these municipalities have the lowest percentage of foreign population.

Counties specialising in manufacturing have lower unemployment rates

MAP 4 Groups of counties in the Basque Country



Group 2. Errioxa Arabarra. Agriculture and an unfavourable situation

This county can be differentiated from the other groups as it is the only one where specialisation in agriculture predominates. Industrial employment in the county is concentrated in industrial activity related to agriculture. Another noteworthy feature is the concentration of employment in high- or medium-high-tech. Even though there is a group of high-tech enterprises, this county also has the highest unemployment rate and the lowest income level. The low educational level, high rate of dependency and small size of the services sector are other characteristics that distinguish it from the other groups.

Group 3. Counties polarised by provincial capitals and specialisation in services

These counties correspond to the three capitals, as well as the county of Uribe, in Bizkaia. Specialisation in the services sector is more evident than in any other group. This has its counterpart in limited industrial activity, agriculture and fishing. Moreover, these counties have the highest percentage of employment and advanced or knowledge-intensive service enterprises. The high percentage of population with tertiary studies, high population density and good road access are also noteworthy features.

The counties corresponding to the three capitals have a higher percentage of employment in knowledge-intensive services

Group 4. Counties specialising in services

These are counties where, as a result of the crisis and the corresponding loss of manufacturing activity, there is a specialisation in services, although lower than in Group 3. In addition, the services sector is less advanced, which is reflected in a lower percentage of firms with R&D activity, lower rate of employment in banking services, insurance or business services and a smaller number of knowledge-intensive enterprises. Education and income levels are lower in comparison with Group 3.

The analysis provides a clearer picture in terms of counties' industry specialisation, although their degree of expertise — especially in the case of manufacturing and agriculture — is lower than in the pre-crisis period. The situation with regard to unemployment and income levels is also more unfavourable if the current values are compared with pre-crisis figures.

It should also be noted that the industrial belt that existed before the crisis remains and has even expanded. It also includes counties from the three historical territories. Similarly, counties specialising in agriculture with an unfavourable situation before the crisis, now stand out in comparison with the other industries due to the current weight of the services sector in their economy. However, as noted above, this change of specialisation occurs, primarily as a result of a loss of activity in agriculture and fishing. In addition, it can be highlighted that the services sector predominates mainly in the counties where the provincial capitals are located.

The industrial belt that existed before the crisis still remains

Conclusions and recommendations for the future

The broad territorial diversity of the Basque Country indicates the need to work on defining policies that foster the competitiveness of the territory by taking into account the existing differences. Commitments to supporting competitiveness may therefore be different within the same region or adapted to the existing territorial diversity.

This diversity can be addressed by analysing the three historical territories and the different groups of municipalities and counties that share profiles and competitive challenges.

In the first case, the analysis of the historical territories has given us an idea of both the similarities and differences among them. It is therefore possible to identify structural characteristics that are common to the three territories (such as a similar average firm size), as well as differences (a greater specialisation in the services sector, for example, in the case of Bizkaia). The similarities make it desirable to have a framework of common policies, which, for example, may be established at the regional level (an example of this would be policies regarding human capital). But the differences identified provide arguments for designing and implementing distinct territorial strategies (for example, a specialisation strategy and more ad hoc policies for the services sector in the case of Bizkaia).

The differences identified provide arguments for designing and implementing distinct territorial strategies

Differences can also be observed at the level of performance indicators (for example, better innovative performance by firms in Gipuzkoa). These differences may be due either to particular conditions in the territory (for example, greater industrial

specialisation, a greater proportion of cooperatives, the existence of more innovative firms at the outset or more RVCTI stakeholders), or to public policies having an incentive effect.

In terms of the municipal analysis, the typology developed may have two major applications. Firstly, when designing planning and territorial cohesion policies at supra-municipal levels, it is possible to take these features into account and adapt policies accordingly. A classic example from the federal literature is federal equalisation transfers made by higher-level governments to lower-level ones to reduce differences in available public revenue or the cost of services. It should, however, be noted that county-level policies, which will be referred to below, while seeking to take into account the regional diversity of the Basque Country, may find it difficult to identify the different situations faced by the municipalities within them. Secondly, the municipality typology may help municipalities identify others with similar difficulties, which would allow them to initiate learning exercises (policy learning), sharing experiences and, where appropriate, undertaking joint activities.

The municipality typology can help to initiate learning and collaboration exercises

However, at the municipal level, in most cases, there are limitations when addressing certain challenges. Moreover, these challenges are frequently shared by surrounding municipalities. Therefore, to identify situations with the greatest similarities, it is preferable to start with the results of the county analysis. Four large groups of counties have been identified from the analysis carried out with the latest available data.

Furthermore, a number of counties marked by a drop in manufacturing activity have been identified along the central belt in the region. Commitment to underpinning the industrial sector may be an option to advance the competitive performance of these counties. In this regard, coordination with provincial and regional strategies in the field of advanced manufacturing is an opportunity to maximise the capabilities and resources of the territory.

In addition, in counties with a greater proportion of agriculture and fishing, the integration of high-tech manufacturing processes and knowledge-intensive services may be a key opportunity to enhance specialisation. Municipalities and counties in which specialisation in agriculture is accompanied by high- or medium-high-tech manufacturing activity show higher levels of income, lower unemployment rates and, in general, positive competitive performance.

A third situation corresponds to counties polarised by the presence of the capitals, the larger municipalities and clear specialisation in the services sector. Their competitive performance and resulting favourable environment are determined by the existence of knowledge-intensive services. The development of this type of service may be a clear objective, both in the capitals themselves and in metropolitan area municipalities. Likewise, the development of this segment of services may support the commitment to diversification of municipalities and counties with the manufacturing and agricultural industries mentioned above.

In metropolitan areas there is a commitment to develop knowledge-intensive services

Finally, in counties where unemployment levels and loss of economic activity are cause for concern, the need to rethink existing goals and coordination among social policies and those aimed at promoting competitiveness has become urgent.

Dialogue among different levels of government and stakeholders in each of the situations described above would facilitate the necessary alignment of objectives and strategies. It would also support forging a shared vision of how to address territorial diversity in the field of competitiveness policy. Provided the areas of authority for each level of government are respected, creating spaces for multilevel governance is therefore a possible way of addressing the diversity and territorial complexity corroborated by this analysis. These spaces, shaped not only by the public sector, but also by stakeholders in the private sector, form part of regional strategy entrepreneurial discovery processes.

Lastly, when working toward a shared vision, it should be pointed out that the different territorial circumstances do not always coincide with their administrative situation and that the important stakeholders in a given a territory cross administrative borders in most cases.

Section V.
Strategy and policy.
Conclusions

Although public policies appear in all sections of the report in one form or another, an explicit reflection on the development strategy applied in the Basque Country and the competitiveness policies on which it relies should not be ignored.

With that aim, this section begins with a discussion of recent literature on regional strategy. Today, it is recognised that the ideas of economic liberalism and conventional economy that have dominated the economic debate for many years, although valid in some fields, do not provide satisfactory answers or explanations to the processes of change and the challenges of innovation-based development. Rather, analysts and organisations like the European Commission, OECD and World Bank, among others, recognise once again that markets do not always exist or operate in an efficient way, and that a certain margin exists for territories to shape their future through development strategies. Particularly, with the aim of reducing the gap between Europe and the United States, the European Commission developed the idea that all the regions and nations of the EU should adopt smart specialisation strategies based on research and innovation (RIS3). In fact, it has established the ex ante condition that any region desiring to access structural and investment funds must have an RIS3.

Some authors suggest that the literature on RIS3 is 'old wine in new bottles' (Asheim, 2013), namely, that most of the characteristics put forward regarding RIS3 (the need to prioritise, to build on strengths, to be evidence-based, etc.) should actually be required of all strategies and have already been claimed by some in the past. The truth is that with regard to the usual practice of regional strategy, the RIS3 is more than 'new wine'. Moreover, the insistence of RIS3 that 'thematic priorities' (and not just 'horizontal' policies) must be set, represents a considerable break from what was common in evolutionary theories and in the literature on regional innovation systems. The idea that it is not the Government which set the priorities, but rather that these may arise as a result of an 'entrepreneurial discovery process' is also fairly new.

One of the innovations contained in the RIS3 is the idea that it is not the Government that sets territorial priorities

The problem is that, although they are attractive from an intellectual point of view, such concepts (as well as some other content in the RIS3 literature) are too general and do not shed much light on how to put them into practice. In a sense, based on some rather vague ideas or concepts, the European Commission has launched processes for designing strategies and policies in all the European regions, for which as yet there is no sufficiently developed arsenal of analytical instruments. Even at the risk of oversimplifying, we can say that enough is known about what to do in a strategy, but not so much about how it should be done or by whom.

Moreover, when looking for conceptual developments on which to base or build the analytical instruments, economics does not usually offer many possibilities. At present, here, as in many other areas of knowledge, in order for progress to be made, the barriers of traditional disciplines need to be broken down, and economists must explore — or search for collaborators in — the fields of business management, political science, psychology, history, education sciences, etc. The authors of this section have attempted this, bringing ideas developed in other areas to the debate about the RIS3 in the Basque Country, although not indiscriminately. In fact, the nature of a territory is different, for example, to that of a company, and territorial leadership has connotations that are unlike personal and business leadership. The same is true of the inertia or dependence of past experience, among other aspects.

In particular, after briefly reviewing what RIS3 consist of, this section demonstrates the differences between a regional strategy and a business strategy. Thus, by indicating the issues a regional strategy should cover, a framework is established with which to organise the analysis of programmes and plans related to competitiveness approved by the new Basque Government that came into power in late 2012. Discussions on regional strategy (which clarify and allow for the strategy and competitiveness policies supported by the Basque Government to be assessed at a later date) include the distinction between approaching strategy as a plan and as a process, differentiation between territorial and government strategy, and between strategy and public policy, etc.

A distinction should be made between approaching strategy as a plan and as a process

Competitiveness policy in the age of smart specialisation strategies

Why it is important for productive transformation

For a long time thinking was dominated by economic liberalism, according to which territories did not need to have economic development strategies. Even so, from the mid-20th century there were authors, schools of thought and even institutions that supported such strategies, although they understood them to be frameworks for presenting priorities and policies in a very broad sense and not as guidelines to address specific challenges. In addition, they focused on the role of the government and considered strategy to be the same as public policy. The situation changed when authors such as Rodrik (2004) demonstrated the need for a new type of industrial policy. And again when the European Commission advocated and required all regions to have a development strategy based on research and innovation for smart specialisation (RIS3), which has inherited concepts from traditional mission-oriented science and technology policies that have also re-emerged in recent years (new mission-oriented policies). Amongst the innovations introduced by this new approach is the emphasis that territories should have thematic priorities and that these should be the result of an entrepreneurial discovery process which involves the four stakeholders in the quadruple helix: firms, government, knowledge organisations and civil society. It should therefore be noted — although this point is possibly the most difficult to put into practice — that strategy involves all the components of a territory and not just the government (although the role of the latter and its facilitation may be key).

These territorial strategies differ from business strategies in their objectives (the 'what for'), in their subject matter (the 'what') and in their processes (the 'how' and 'by whom'). The objectives of territorial strategies are usually specified in terms of economic competitiveness, but also of social and environmental sustainability. As for the subject matter, such strategies must choose in which activities the territory will specialise, which specific assets will be offered so that firms will relocate there, who the target actors and the main stakeholders are, on whom said activities will rest, what the role or connection to the region with regard to other territories and outsiders will be, and what the internal structure of the territory will look like. Lastly, the strategy should define governance processes, the participation of stakeholders and leaders.

In particular, strategy (or the organisation of the objectives of a variety of public and private actors) should not be confused with public policies (or the means of the government to support these strategies). In addition, since a strategy must be the fruit of ongoing learning processes in which the traditional division between design, implementation and evaluation loses its meaning, implementation and evaluation must be taken into consideration from the outset.

It is important not to confuse strategy with public policies

Both the construction of new governance for the development of territorial strategies and the policies combined with them require changing policy-making methods and the internal organisation of the public administration. In other words, the challenge of public innovation can be considered as both internal organisational innovation and innovation in the way policies are made.

Public innovation is a challenge in territorial strategies

All these elements, and the regional strategy itself, can be either catalysts or barriers for productive transformation, and for this reason it is essential to understand the foundations on which they rest, as well as the Basque scenario where these concepts are to be put into action.

The current situation in the Basque Country

An analysis of policies linked to the competitiveness and innovation of the Basque Country is set out below, paying special attention to the actions that have taken place since the last change in government at the end of 2012. To do this, we have analysed key documents and the plans of the current Basque Government team related to competitiveness and innovation,[14] as they reflect policy design and, where relevant, the territorial strategies of the Basque Country.[15]

An initial analysis of the situation of territorial strategies for the Basque Country is presented in Table 10, structured around three key questions that any strategy must answer: *what for*, *why* and *how or by whom*.

Strategy objectives: 'what for'

In the case of the Basque Country, it has progressed from an initial phase (in the 1980s) in which the emphasis focused on industrial restructuring and the construction of bases for competitiveness, through a second phase (1991-98) which promoted competitiveness of a more proactive nature (based on quality and efficiency), to reach a third phase in which a more participatory and systemic competitiveness (based on innovation) is sought. In all three stages, the common feature has been generating wellbeing for Basque society, based on economic progress (economic competitiveness), but always avoiding vast social differences (socially inclusive or solidarity-based competitiveness).

The common feature of all stages of the Basque strategy has been the generation of wellbeing for society

Currently, the priority objectives of the strategy are economic growth and employment, peace and coexistence and the development of a new political status for the Basque Country. While the first objective is the most closely linked to competitiveness, policies that emerge from this strategy have to maintain a balance between economic objectives and competitiveness and those of a social nature. This is especially important during an economic and financial crisis when it is possible that, due to a lack of resources, efforts tend towards a type of policy that seeks social wellbeing, but forgets that competitiveness and innovation also have repercussions in this area.

[14] The 2014-2016 Framework Programme for Employment and Economic Recovery (which, in turn, includes the Employment Plan, Industrialisation Plan, Internationalisation Plan, Plan for Science, Technology and Innovation and Public Investment Programme), the IV Basque Plan for Vocational Education and the 2015-2018 University Plan have been included in the analysis.
As is the case with other sections of this report, a more detailed analysis of this aspect can be found in *The Basque Country Competitiveness Report 2015 Cuaderno 5* (Orkestra, 2015e).

[15] The importance of plans and strategies from other territorial units (for example, from the historical territories) is recognised, although the analysis in this case focuses only on the Basque Country.

TABLE 10 Competitiveness strategies and policies in the Basque Country

		Legacy of the 1980-2012 period	Objectives and actions proposed in the current plans
What for? (overall goals to be achieved through the strategy)		Good position in economic and social aspects, with worse position — although with positive growth — in environmental aspects	Economic upturn, recovery of growth and employment
			Peace and coexistence
			New political status for the Basque Country
Areas	**Economic activities**	Specialisation in energy and medium-high-tech manufacturing, with high levels of clustering and related variety	Vertical priorities: advanced manufacturing, energy, biosciences/health care and niches of opportunity linked to the territory
	Science/technology	Engineering specialisation and capabilities. Decrease in social sciences and increase in biomedical sciences	
Assets	**Innovation**	Technological innovation and limited organisational innovation, commitment to input in R&D and knowledge generation, inefficiency of the system	Increase the excellence of the Science, Technology and Innovation Network and promote innovation as a transformation process for the Basque Country (PCTI-2020 horizontal priorities)
			Technological and non-technological innovation
	People	Technically well-trained people lacking cross-disciplinary and language skill	Guarantee development of the labour force in science, technology and innovation
			Improve the level of excellence and quality of Basque vocational education. Innovation in the vocational education learning model
			Stimulate the labour force to tackle international markets
			Capabilities for the competitiveness of the productive fabric
			Stimulate creativity and constructive thinking
	Physical infrastructure	Good infrastructure with significant need for improvement in management	No unusual investment in physical infrastructure during this period. Priority given to investments in high-speed rail and the validation and demonstration infrastructure
	Institutions and social context	High level of competence (Basque economic agreement, etc.). Institutional concentration that somewhat enables innovation, but also results in duplication of effort	Coexistence and peace process
			Complicated situation for labour relations
			Complex system with many stakeholders and high risk of cannibalisation
Priority stakeholders	**Private/public**	High number of public/private collaboration initiatives with shareholders' equity created with risk of inefficiency and cannibalisation	Reworking of the cluster policy
Target stakeholders	**Type of company / Innovation agents**	Prevalence of medium-sized firms and strong support for cooperatives	Commitment to existing stakeholders, with less focus on the new
		Prevalence of technology centres and CRCs or BERC with less weight on the university and the non-technical KIBS	Restructuring of the RVCTI, making it more market-oriented, in pursuit of excellence and specialisation
Relationships	**Outside the Basque Country**	High degree of openness in more traditional spheres (products), but high degree of inbreeding in attracting foreign interest and less traditional spheres (services, capital, knowledge and people) and markets (Asia, among others)	Incorporate a global dimension into every aspect of knowledge and action, beginning with the European Union, Vector 3 of the Internationalisation Strategy emphasizes alignment with the European framework
		Policies that favour local stakeholders over international ones	Develop and guide resources to achieve research excellence and international recognition (university)
			Acquiring knowledge
	Between the areas and internal stakeholders	Insufficient connections among system stakeholders	Restructuring of the RVCTI
		Opportunities for county-level heterogeneity being developed through bottom-up initiatives	Need for organisation at different territorial levels. Progress on coordination at the local level in Gipuzkoa
Participation and degree of political and social consensus, and degree of execution		Several group initiatives that help to create a strategy for the Basque Country, but lack of one initiative to organise the various existing plans	Progress towards participatory models of consultation during the design phase of plans, but limited during the implementation and evaluation phases
			Need to further strengthen interdepartmental coordination and coordination with governments in other territorial units

Source: Compiled by authors based on Aranguren et al. (2012) and the following documents from the Basque Government: Strategy for Employment and Economic Recovery, Framework Programme for Employment and Economic Recovery, 2020 Internationalisation Framework Strategy: Basque Country Strategy, Plan for Science, Technology and Innovation (Euskadi 2020 PCTI), 2014-16 Plan for Business Internationalisation, 2014-2016 Industrialisation Plan, IV Basque Vocational Education Plan and 2015-2018 University Plan.

Strategy content: 'how'

Economic activities

In the Basque Country there has been an ongoing commitment to industry

The commitment to industry has been a constant in all phases of the strategy, although the approach has been different. Currently, three vertical priorities (advanced manufacturing, energy and biosciences/health) have been defined, along with a few niches of opportunity related to the territory (a food industry more closely linked to sustainability and the human environment, territorial planning and urban regeneration, leisure, entertainment and culture and specific activities related to ecosystems). The vertical prioritisation of advanced manufacturing and energy is more related to building on the entrepreneurial and scientific/technological capabilities existing in the territory, while that of biosciences/health is considered a priority which can generate more ground-breaking diversification and drive the diversification of different industries, such as, for example, machine tools or food.

In addition, the Basque Country is a pioneer region in the development of a cluster policy which has been maintained, with some changes, since the beginning of the 1990s and has been renewed in the current legislature as a result of new challenges that have emerged (for example, cooperation between clusters), some of them very closely linked to RIS3.

Scientific/technological activities

Commitment to the manufacturing industry in the Basque Country has generated significant skills in the field of engineering, to the detriment of others, such as in the social and biomedical sciences, although there has been progress in the latter in recent years. However, one of the problems for competitiveness in the Basque Country is the decline in interest in technical and industrial studies. Nonetheless, the intention is to address this weakness through both universities and vocational education centres. In fact, during the crisis this situation already began to correct itself.

Assets or specific functions that determine the attractiveness of the Basque Country

In terms of assets or functions that are paramount, the PCTI-2020 has set as a priority excellence and promotion of innovation, both technological and non-technological, improving the efficiency of the system, increasing the connection between agents and overcoming the 'valley of death'. For this reason, work has been done particularly on restructuring the Basque Science, Technology and Innovation Network (RVCTI). Worthy of mention in addition to the PCTI are the Industrialisation Plan (since it basically drives non-technological innovation) and the Plan for Public Innovation (which proposes the organisational adaptation and improvement of public management). Even so, the section argues that the fundamental emphasis continues to be on technological innovation based on R&D and that the more demand-oriented policies are lagging behind.

Target stakeholders

No significant changes are noted in the stakeholders prioritised in the latter stages: medium-sized firms and cooperatives remain a priority, as does R&D infrastructure

over other non-R&D-based knowledge infrastructure. The same is true for the type of relationships maintained outside the Basque Country: internationalisation is considered the most important aspect in all plans. This has resulted, inter alia, in strong growth in foreign investment in the Basque Country in 2013 and 2014, although not all the investment thus obtained should be considered positive.

Type of external connections

With regard to the type of external connections the Basque Country maintains, the strategy has been characterised by the absence of relations with neighbouring regions, by its continued effort to reduce dependence on Spain, by its integration as a region, by the increase in relations with Europe and its internationalisation, moving first into Latin America and then into Eastern Europe and Asia. In relation to external relationships, existing policies have favoured local actors over international ones.

Basque strategy does not take neighbouring regions into account

The last two legislatures have attempted to change this situation. Indeed, the aim of the present government is to incorporate a global dimension into all areas of knowledge and performance, while maintaining an emphasis on relations with Europe and to a lesser degree on connections with the neighbouring regions and Spain as a whole.

Internal organisation within the territory

Target areas for internal organisation within the territory are the restructuring of the RVCTI, the University Plan, the Vocational Education Plan and the Plan for Public Innovation. But there has been no significant progress with regard to organising the different territorial levels (autonomous community, historical territories, provincial capitals, counties and municipalities).

Further progress is needed in the organisation of the different territorial levels

Strategy process: 'how' and 'by whom'[16]

One of the most important aspects of the development of a regional strategy is its governance and leadership. In particular, the RIS3 advocates identifying a region's priorities by means of an entrepreneurial discovery process. The strategy must, then, be the result of a participatory process which includes the participation of the various stakeholders that make up the 'five helixes' of the innovation process: public authorities, business community, academic world and knowledge infrastructure, civil society and financial world. In this area, examples of public-private collaboration experiences in the Basque Country show that structures have been created that meet the requirements of new modes of governance. However, the processes that should be put into operation through such structures advance slowly. As well as clusters, the Basque Country also has various collective initiatives that could contribute to producing a regional strategy (Innobasque, Euskalit, local networks of collaboration emerging under the auspices of local development agencies such as Garapen and

[16] One of the distinguishing characteristics of the Basque Country is its high level of self-government in areas such as health, education, research, security, housing, employment, economic development and taxation. However, as expressed in studies by outside experts such as the OECD (2011) and Morgan (2013), governance of the Basque innovation policy is complex. Coordination between the different departments of the Basque Government stands out as one of the main challenges. Additionally, in the Basque Country there are policies and innovation at five different territorial levels, making coordination among them key.

Eudel), but there is no initiative that unites existing initiatives to build a shared vision of a strategy for the Basque Country.

To move from a government strategy to a shared strategy for the Basque Country, it is important to move forward on methods of governance and ways to implement the strategy ('how'). The construction of these outward-looking models of governance also requires public innovation and an 'entrepreneurial state', as Morgan (2014) and Mazzucato (2011) point out, an aspect that is included in the 2014-16 Plan for Public Innovation.

Finally, there has been some progress in monitoring and evaluation (a weakness of the Basque system that experts such as Morgan and the OECD have highlighted), although much remains to be done to achieve a holistic assessment that takes into account the different aspects of a regional strategy and their interrelationships, including the policy mix of different levels of government.

Conclusions and recommendations for the future

A few lessons and challenges for the future can be drawn from the review of the literature on development policies and strategies. First of all, there is some scope for shaping the future and therefore, to that end, the territories should prepare and implement development strategies. Secondly, when preparing said strategies, how to put them into practice should be taken into consideration from the outset. Thirdly, although there are no definitive recipes indicating how to do this, there are certain 'best practices' (involving all stakeholders, operating with shared leadership, etc.) that can be followed. Fourthly, it is necessary to break away from previous inertia and, in particular, to change the way policy-making is done and the internal organisation of the public administration.

Based on the analysis of the design of the current regional strategies, there are some critical challenges ahead for competitiveness policies.

A balance between economic and social development should be maintained

The first is to no longer consider economic, social and environmental development as separate and mutually exclusive aspects, but to understand their interaction and impact on the future wellbeing of the entire population of the Basque Country. Certainly, this equilibrium is more complex in situations of crisis and lack of resources such as the current one. In particular, policies which, although appearing to include social development, do not actually have clear objectives for efficiency or the protection of people in need, should be avoided.

The second critical challenge is to advance towards obtaining regional strategies, in addition to government strategies and those of other stakeholders in the territory. The convergence of strategies should not be imposed; rather they should flow out of processes aimed at generating visions shared by all the main stakeholders working on competitiveness and at generating a framework of incentives, structures and regulations that promote the progress of the strategies of all stakeholders.

The third key challenge is incorporating the perspective of process into regional and government strategies to foster what the RIS3 proposes as an entrepreneurial discovery process. The idea that plans are fixed and immutable only to be reviewed

and adapted every few years should be avoided at all costs. Strategy must be understood as a process rather than a plan, although plans, if they are defined in a flexible way, are very valid as frames of reference. Reflection on these processes (and ultimately, on how to carry out the strategy and who has to do it), should be present from the outset and not be raised after defining the content of the strategy.

In this process, it is essential to understand the role of public policies and their relationship to the strategy. Thus, many of the regional strategies continue to be built from a linear perspective, and therefore implementation and evaluation, which are integral parts of the whole, are relegated to the background and more importance is placed on design. Moreover, huge amounts of resources are often poured into the design of a strategy without stopping to consider the policies and programmes (from the government) and actions (from the perspective of stakeholders) that will enable it to be put into practice. This leads to situations of past dependence that may negatively influence future pathways.

In addition, one of the main processes in the strategy on which forward progress must be made is entrepreneurial discovery. These processes are open and flexible (not closed and immutable plans) and require generating new ways of working in the regions, sometimes making it difficult to see results within a political cycle.

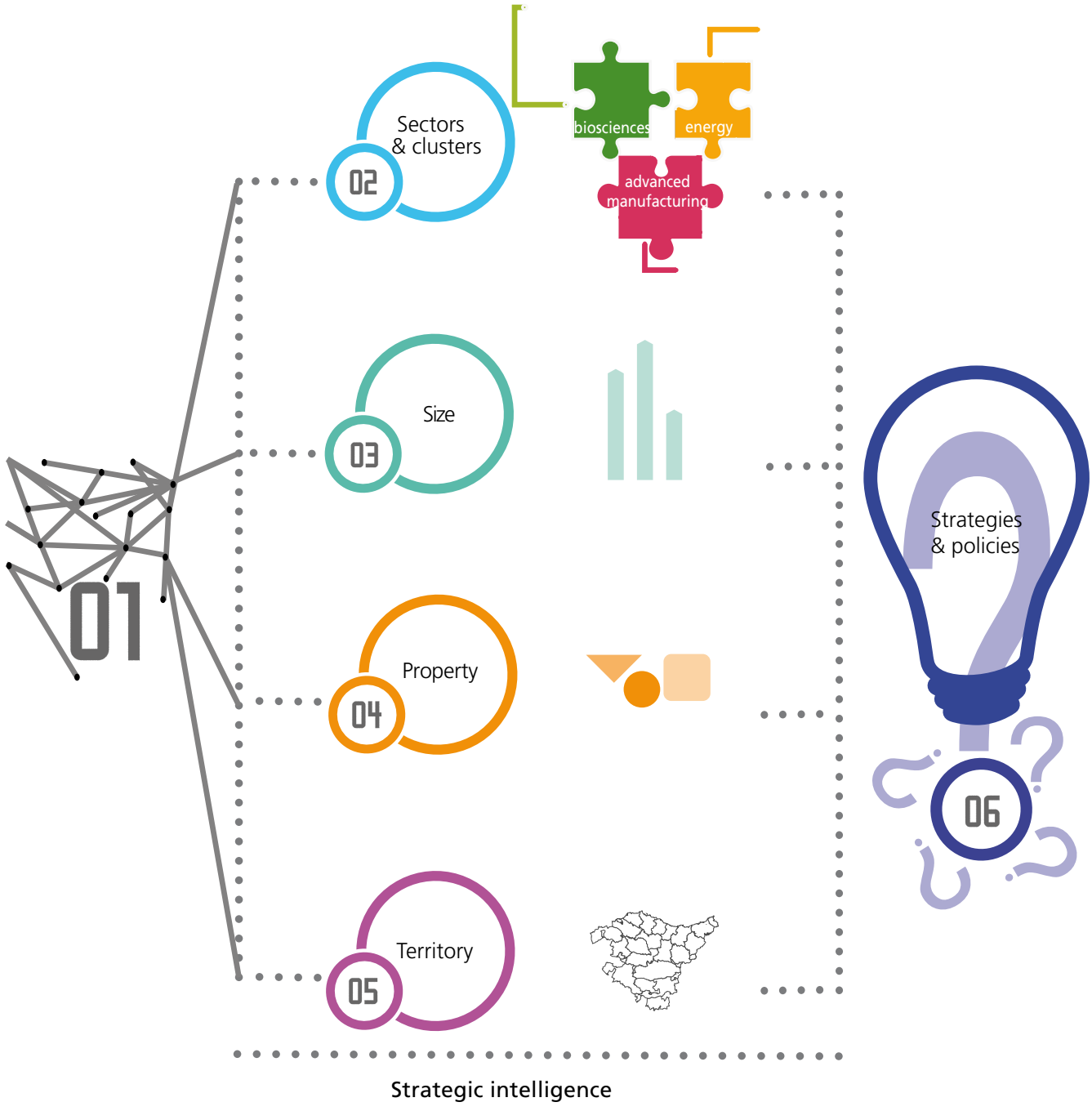
Therefore, to put them into practice, new models of governance and innovation need to be built in public administrations, along with inter- and intra-institutional coordination and new leadership models. The process requires strategic intelligence in order to incorporate new instruments that benefit the strategy.

New models of governance and public innovation are necessary

Conclusions and recommendations

The main conclusions and recommendations are grouped around five determinants for the practical application of productive transformation that have been explored in the different sections of the report. These are shown in Illustration 7.

ILLUSTRATION 7 Conclusions and recommendations



Conditions facing the Basque Country in the new scenario: the risk of divided development

If we look at the social indicators, we may conclude that the crisis has had more serious repercussions for the Spanish economy — and thus the Basque economy — than for the other EU economies. But from the analyses carried out in Section I, it is also clear that the Basque economy still has significant competitiveness, as measured by the latest territorial and business competitiveness indicators (namely, GDP per capita and economic profitability) and the main indicator of economic performance that makes these possible (productivity). Therefore, the main challenge currently faced by the Basque Country is job creation, as indicated by the data on unemployment rates.

The main challenge for the Basque Country is job creation

The analysis of the financial status of Basque firms, as well as the results of the analysis of firm size and industry, reveals that, contrary to the general opinion put forward (mainly about the Spanish economy, but frequently extrapolated indiscriminately to the economy of the Basque Country), Basque firms are in relatively sound financial condition. Thus, firms in the Basque Country are in a sound financial and economic position to benefit from the promising perspectives signalled by forecasts and indicators from international organisations such as the IMF and European Commission. This is even more so if we take into account the specialisation of the Basque economy in the industries most sensitive to the economic cycle: intermediate and capital goods and durable consumer goods.

Either way, the analysis has shown that aggregate analyses and those based on averages conceal a wide range of diversity. Thus, alongside a broad group of firms that are in a position to initiate investment and growth policies, there is another group which still requires certain measures and debt reduction processes. Public policies must take both of these situations into account.

In short, a mixed picture emerges from the competitiveness analysis in Section I. On the one hand, the level of competitiveness is, in general, noteworthy. On the other, the crisis has created high unemployment rates and the main challenge for the Basque Country today is job creation. Additionally, the economic-financial analysis of Basque firms shows positive results in general, but at the same time, a third of the firms report losses. This means that there is a risk of evolving towards a divided territory, with some industries, firms, workers and citizens not being able to escape the crisis. Public policies should be able to identify these different situations and work towards ensuring that the Basque Country is able to emerge from the crisis and move towards wellbeing as a whole.

There is a risk of evolving towards a divided territory

Over the past three decades, the Basque Country has been characterised by fostering competitiveness strategies that sought economic growth and the generation of value compatible with an acceptable distribution of income together with joint competitiveness. Therefore, after the crisis, the Basque economy now faces the challenge of tackling policies that avoid creating divided territories and are able to maintain the model of competitiveness on which strategy has been based in recent decades and which guaranteed the wellbeing of the population as a whole. Thus, it will be necessary to combine investment and growth policies with others that

guarantee the wellbeing of the most underprivileged groups. In addition, taking into account the demographic and ageing processes that are taking place and the environmental challenges presenting themselves, it seems urgent to develop policies that foster economic, social and environmental competitiveness and that strengthen one another. In order to enable this development, a holistic approach towards strategies and policies is necessary; one that involves coordination among the different organisms and organisations of the administration, and in some cases, internal reorganisation and innovation of the public sector.

Growth and wellbeing policies must be combined

More particularly, the emphasis of economic competitiveness policies in the upcoming period must be on fostering investment and growth, in order to benefit from the current economic and financial situation of Basque firms and from the favourable prospects of the economic cycle for advanced economies. But this must be done without missing the opportunity to simultaneously correct certain weaknesses or unresolved challenges that the analysis in this section has highlighted. These include:

- Job creation.
- Keeping poverty at the low level that the general analysis in Section I reveals, while correcting the sharp increase in inequality found in the analysis of labour and productivity costs.
- Being more proactive with measures to address the ageing challenge and the losses that the Basque economy might suffer as a result of migratory flows, as highlighted in the general analysis of the first section.
- Promoting institutional reforms (for example, collective bargaining) that act on costs and prices, promoting formulas based on employee participation in business results. This will help avoid reproducing situations revealed in the analysis of labour and productivity costs: loss of competitiveness in costs, without noticeable improvement in the general distribution of income.
- Continuing to improve the efficiency of the innovative system to reduce the gap between input and output levels, shown in the general competitiveness analysis. To do so, it is crucial to foster non-technological and social innovation (how agents interact with one other).
- Addressing the challenge of size that recurs throughout the report and, related to this, the availability of appropriate financing facilities.
- Underpinning the change in goods exports and attracting foreign capital that occurred in 2014. This will allow the Basque economy to continue to open up and will reduce the vacuum that is still present, ensuring that capital is attracted by innovation capabilities and expertise and seeks to remain in the Basque Country for the long term, becoming integrated into the Basque system.

Diversification of the Basque economy

During the crisis, the Basque Country continued to move forward in its productive transformation process, increasing the weight of its services and manufacturing at a greater technological level. As a result, today the sectoral structure is considered diverse and is equivalent to those found in advanced economies, although it has a

greater degree of specialisation or industrial orientation. Although partially at the expense of significant job losses, Basque industries reported a positive evolution during the crisis in many of the business competitiveness indicators. In general, the performance of services has been more positive than that of industry and, of course, than that of the construction industry, to a large extent due to the role of the Basque public sector as a buffer during the crisis.

In order to dig deeper and more purposefully guide the diversification and productive transformation process, we must consider the significance of the three thematic priorities chosen by the Basque RIS3 together with the productive transformation that they may bring about.

The joint strategy of the territory should aim for a certain balance between long- and short-term commitments or actions, more ground-breaking and incremental diversification processes, productive transformation with a scientific or analytical base and those with a more synthetic and symbolic base or more focused on engineering. In the Basque case, this diversity is reflected in the three priorities chosen by the RIS3, as specified below, and also in the combination of these with the so-called 'opportunity niches', which cover fields of specialisation of a less industrial nature, with a symbolic knowledge base more closely linked to the urban environment.

The Basque Country's strategy includes a range of initiatives, with a balance between the short and long term

Therefore, the summary of the characteristics of the three strategic priorities chosen by the Basque RIS3 seems to indicate that this diversity is present in all of the initiatives. In the aforementioned analysis, among other things, we can observe:

- The current weight of the economic activity of the firms to be assigned to each priority varies from less than 1% in biosciences to around 25% in advanced manufacturing.
- The type of transformation and growth expected is ground-breaking with forecasts for high growth in biosciences. However, in advanced manufacturing, it is more incremental and the expected growth in demand is average. This balance between types of activity is also observed within the same priority, as is the case with energy, where more mature activities (such as the petroleum and gas industries) are combined with infant industries (such as wave power).
- With regard to type of transformation, the knowledge bases are more scientific in the biosciences, more focused on engineering in advanced manufacturing, and mixed in energy.
- Competitiveness varies from one priority to the other (energy is the most competitive and biosciences the least).
- The level of market failures and the strategic nature of the activity, and consequently, the level and types of intervention, vary greatly among the three priorities. Thus, for example, advanced manufacturing operates closer to the market and requires a lower level of public intervention, while its weight in the economy and the broad range of activities and organisation involved make improving connections and coordination particularly necessary. For their part, the biosciences have a huge knowledge component based on R&D and very sensitive areas (human health, for example). This leads to intense public intervention in many non-traditional forms, especially when the business sector (and even the science and technology sector) is as underdeveloped as in the Basque Country.

In light of this, it can be deduced that although the priorities also have common characteristics and challenges, their unique elements mean that an ad hoc strategy must be adopted for each of them.

The unique aspects of the thematic priorities mean that a specific strategy must be adopted for each

In fact, the analysis has shown that, although firms, infrastructure, investors and the administration operate in all three priorities, the weight of each of these actors in the development of this field and strategy is very different. An actor by actor comparison also brings out differences (for example, the prominence of large firms and SMEs in the strategy). As a result, the level of interaction between the R&D&I infrastructure and firms is very different in the biosciences (in fact, it barely exists) and in advanced manufacturing (where there is a substantial relationship between technology centres and medium-sized and large firms). Non-traditional financing facilities are necessary in all three priorities, but in the biosciences, options such as venture capital and inflows of international capital (for example, from large pharmaceutical firms) may be of great significance. However, in energy, financing may come from other sources (for example, through access to source markets, industrial portfolios from Basque financial institutions, etc.).

More could be said on the organisational aspects of each priority, in the broad sense. The type of association varies significantly: in the biosciences there is a sectoral or pre-cluster grouping; in energy, the association takes the form of a cluster; in advanced manufacturing there is a variety of clusters that creates a platform. The agencies or organisations managed by the government to develop and support the strategy also vary, as well as the number and type of coordination among departments and institutions. The situation is similar with regard to the main paths to productive transformation: the biosciences are more often based on radical foundation, while in advanced manufacturing they are based more on modernisation. Even the entrepreneurial discovery processes vary. In short, each priority has its own features that require horizontal policies in order to become 'vertical' or adapt to each case and take into account the peculiarities of the sphere to which they are applied.

However, some challenges are common and, thus, a series of general recommendations can be established for all three priorities:

- Enabling large firms to act as drivers for smaller ones from the perspective of 'creating shared value' (for example, in biosciences this would help them to overcome problems in the areas of management, business development and marketing; in advanced manufacturing and energy it would foster better integration into global production chains).
- Achieving greater overlap between the R&D&I infrastructure and firms.
- Involving investors (fifth helix).
- Overcoming inter-departmental and inter-institutional divisions, initiating more advanced intervention mechanisms and improving coordination to advance towards more holistic policies and strategies.
- Clarifying and coordinating the role of agencies and their relationship with cluster associations.
- Using different types of public-private coordination in accordance with the different situations in which they operate, while at the same time overcoming the current fragmentation and lack of collaboration.

- Encouraging and promoting multiple entrepreneurial discovery processes in each priority while addressing the unique aspects of each one.
- Without neglecting R&D, deal with the organisational innovation, marketing and financial shortcomings facing firms in all three priorities. Introducing ICT, innovation in business models and servitisation are key challenges for all three priorities, but especially for advanced manufacturing.
- Establishing an internationalisation strategy that focuses both outward (tackling the problems that are blocking it, such as the lack of financial, technological and organisational muscle) and inward (attracting foreign capital and its involvement in the development strategy for the priority in the territory).
- Tackling the problem of size that is key for all three priorities, although from different perspectives.

Lastly, experiences such as those of 'hidden champions' (or more accurately, international niche market leaders, INMLs) show that diversification and productive transformation processes can also take place outside the three aforementioned priorities. In fact, these processes can take place in what the Basque Government calls 'opportunity niches' and where industries connect, such as creative industries, a reflection of the specialisation of certain counties and municipalities like Bilbao. In addition, INMLs can serve as a guide for other firms and, in particular, to focus on design and promote entrepreneurial discovery processes that should be initiated within the three vertical priorities chosen by the Basque RIS3.

Hidden champions can stimulate entrepreneurial discovery processes

Firm size

In the Basque economy there are fewer large firms than in other territories. But just as elsewhere, large Basque firms — except in the services sector — have better indicators. However, contrary to what happened in other areas, they did not perform better during the crisis. What is more, if Basque firms are compared to those of similar size in other areas, medium-sized firms are better positioned. In any event, small Basque firms have the greatest competitiveness problems.

Moving beyond the previous results, which stem from the quantitative analyses carried out in this report, the most qualitative analysis on the Basque 'hidden champions' indicates that they are substantially smaller than their European counterparts. Growth is therefore advisable. This challenge is related to expanding their financing mix and their access to specific types of human resources. For its part, from the qualitative analysis of the three thematic priorities chosen by the RIS3, it appears that in the Basque Country, size is a sine qua non condition to address certain key actions for a more favourable inclusion in global value chains and for the region to continue being competitive in this area. Moreover, financing is, in many cases, a basic condition when addressing the problem of size.

Increasing firm size must be supported

In view of the above, from a policy point of view, it seemed advisable to encourage growth in firm size in the industrial sector (and maybe in certain service areas where size also seems relevant). This can be carried out with policies that improve the general environment for establishing a business, in other words, that have an impact on the factors considered by the World Bank (2015) in their famous 'doing business' ranking. This can also be done through specific actions (for example,

corporate concentration processes) in specific areas or key economic activities where size is crucial and where the size of Basque firms is clearly below that of their main competitors. This is found especially in several industries that are part of the advanced manufacturing strategy and in some links of energy value chains.

Furthermore, since it is small firms that have greater weaknesses, it seems obvious that public policies should pay particular attention to them. The competitiveness policies of the Basque Government have mainly focused on medium-sized and large firms, among other things because the main focus has been on technological innovation based on R&D, which is not the basic activity on which the innovation of small firms relies.[17] Special effort should be made to reinforce public programmes that support types of innovation more suited to the characteristics of these firms (for example, organisational and marketing innovation), which are precisely those in which Basque firms are relatively weaker.

Additionally, the three main lines of action that have been launched by the DDEC (cluster policies, RVCTI planning and internationalisation programmes) should include specific actions to cater for this group. Clear action in this sense might be to reinforce the role of vocational education centres in the innovation system and thoroughly incorporate them into the RVCTI. This possibility is mentioned throughout the report.

Cooperatives and firms with foreign capital

Both firms with foreign capital (with a smaller presence in the Basque Country than in other territories) and, to a lesser extent, cooperatives (with a greater presence in the Basque Country than in other areas) report more favourable competitiveness indicators, as a whole, than the average for Basque firms. For this reason, it would seem logical to promote their presence in the Basque Country, despite the fact that in both types of businesses, it is possible to identify aspects with room for improvement.

The aims of Basque public policies with regard to firms with foreign capital should include: (i) increasing the weight of these in the productive system of the region (selectively and not by enabling financial and speculative investment); (ii) increasing R&D expenditure in these firms, and integrating them into the R&D infrastructure and Basque Country cluster associations; and (iii) relying on firms with foreign capital in order to attract more foreign capital and setting an increase in exports as a target.

With regard to cooperatives, once the difficulties inherent to designing strategy and public policy (resulting from the lack of transparency and information about these firms) have been overcome, actions focused on improving their efficiency could be promoted. This would create an opportunity for their efforts in input and results in innovation to produce positive economic results with repercussions for the territory.

[17] The Provincial Council of Bizkaia has especially focused its programmes on this group of businesses, trying to cover other types of innovation beyond that based on R&D (organisational, design, etc.). In Gipuzkoa, the local development agencies cater for this group, but do not have their own financing or stable sources of financing. Also, the three regional governments, together with the Basque Government, encourage organisational innovation through the Kudeabide programme.

The territorial dimension

Section IV shows that there is significant territorial cohesion among the historical territories, reflected in the fact that the differences between them in the competitive development indicators (productivity, exports, GDP per capita) are fairly small. However, as we drill down on the territorial scale to analyse counties and municipalities, the differences increase, although we can still appreciate some fairly common trends and a comparatively high level of territorial cohesion with regard to what is common in other areas. Relatively small differences and common trends are positive points for maintaining common policies for two reasons. Firstly, because it is possible to take advantage of several types of economies of scale and scope when common problems are dealt with jointly. Secondly, because this cohesion is, in part, the result of these common policies (for example, those that have been applied in education).

The diversity and unique aspects of municipalities and regions must be considered in productive transformation strategies

Having common traits does not mean that certain unique features and diversity do not exist or have not been detected in the Basque Country, whether between the historical territories, or between counties and municipalities. They should be taken into account when designing productive transformation strategies and policies for development and territorial cohesion, as these should always be location-based. In the case of Basque Government policies, these differences must be considered, both to cater for territorial cohesion objectives and to guarantee the efficiency of the policies. The main objective of the fourth section was in fact to contribute data and analysis in order to know more about the territorial situation and facilitate the contextualisation of Basque Country strategies and policies.

The differences found in the analysis regarding determinants of competitiveness, intermediate performance and final outcome indicators are closely linked to the endowments or structural aspects of the territory, specifically: sectoral makeup, greater or lesser presence of large firms, existence of cooperatives and firms with foreign capital, weight or presence of innovation system agents, etc. In fact, this is reflected in the great significance of economic specialisation as the automatic classification cluster analysis indicates for the groups of municipalities and counties.

Thus, in general, sectoral makeup and specialisation in Bizkaia are more closely linked to the thematic priorities of energy and biosciences, along with some opportunity niches (territorial planning, urban regeneration, leisure, entertainment and culture, and specific activities related to ecosystems). Meanwhile, Gipuzkoa and Álava are more oriented towards advanced manufacturing (in the case of the latter, also towards opportunity niches in the agri-food industry more closely linked to sustainability and the human environment). Thus, the institutions in these territories should participate more actively in the design and, particularly, in the development and implementation of these strategies. Likewise, the institutions of the historical territories should become involved and actively participate in horizontal actions or policies that may be established with regard to cooperatives and firms with foreign capital, depending on the presence of these types of firms in their territories and on whether the policies they desire to promote (such as an active use of taxation) fall within the scope of these institutions.

In any event, from all the factors studied in the report and those which productive transformation strategies must take into account, the most closely linked to the

territorial dimension is probably firm size. As is shown in Section II, the weakest group of businesses in the Basque economy are small firms. Reaching them requires proximity and taking into account their particular circumstances. This can only be done if the policies devoted to these firms rely on agents close to them and if they are familiar with their characteristics and immediate vicinity (for example, whether most firms in the locality are service or industrial firms, whether there are issues with the availability of skilled labour, etc.). With regard to other policies, although their main objective is not to deal with the specific problems of smaller firms, they must undoubtedly have the necessary territorial diffusion in order to reach them. In this case, knowledge of the territorial situation might enable implementation efforts to be concentrated in places where it is more likely that there are groups of small firms able to benefit from these policies.[18]

Territorial diffusion is key to reaching out to small firms

However, taking territorial dimension into account is not only important for implementation, but also with regard to design and evaluation. When designing policies for small firms or focused on issues in which specific territories show a clear specialisation or concentration of firms, the Basque Government should have channels to enable it to be aware of the problems and initiatives regarding the aim of the policies that exist in the territories. Something similar occurs when evaluating policies already applied, for which the evaluation from agents in close proximity to small firms may be invaluable. In this way, the territorial approach of Basque Government policies could combine both top-down and bottom-up aspects, gaining efficiency and legitimacy.

The strategies and policies promoted at different sub-regional levels act in another sphere of impact: historical territories, counties and municipalities. Even though for a long time, the idea of establishing strategies or economic development plans at these levels was not considered, this situation has begun to change and lately many attempts have been made in this regard, both by provincial councils and provincial capitals and even by county-level groupings of municipalities. These activities are legitimate and make sense as long as the specificity of strategies and actions at each level is clearly understood (i.e., that they do not try to recreate a regional innovation system) and they are tackled from a multilevel perspective (that is, taking into account that these activities must fit in and be coordinated with those carried out at higher and lateral levels).

Regional and municipal strategies are legitimate and must be tackled from a multilevel perspective

With regard to these activities, the analysis of the historical territories is a contribution to the first phase that every regional strategy should include (namely, analysing strengths and weaknesses on which to base the vertical and horizontal priorities adopted). The municipal and regional typologies and characterisations established in the analysis help us to understand the general competitive profile and issues of each municipality and region. They also make it possible to identify territories that share issues and can perform benchmarking exercises or learn good practices and propose joint actions.

[18] For example, programmes that support the introduction of industry 4.0 will, in theory, be more likely to be applied in regions and municipalities that have a clear industrial profile, according to the typologies developed in Section IV.

Strategic intelligence

Strategic intelligence plays a vital role in the development of strategies and policies

Understanding and analysing the growing complexity not only requires new concepts (clusters, global value chains, platforms, etc.), but also strategic intelligence tools that provide information and knowledge when developing strategies and policies. As mentioned in the literature (Kuhlmann, 2003), there are different strategic intelligence tools, among which we can highlight:

- Evaluation, mainly focused on knowing the performance of strategies and policies in the past and present.
- Foresight, more focused on analysing future trends.
- Technology assessment or evaluation of the impact of adopting different options (in this case technological).

In addition, among other types of tools, the literature highlights benchmarking or comparative studies with the situation in other areas as a highly useful and widespread methodology among policy makers for the development of strategies and policies.

Adopting these tools or methodologies involves adopting an education-based approach to strategies and policies, i.e., a focus on strategy development orientated towards learning.

Utilising these tools also requires access to information sources that provide organised data about the situation, in a way that makes analyses workable. Thus, this report shows the need for statistical institutes and other organisations that provide data for economic analysis to supply data about statistical units that differ from those commonly available; or for aggregates more in line with the public policies in place in the territory. At present, we often lack data organised according to basic categories that are common in Basque competitiveness policy, as these categories differ from those that statistics institutes usually produce.[19]

Another clear conclusion resulting from the analysis in this report is that aggregate analyses or those based on averages conceal significant diversity. It thus seems necessary to move forward in terms of data and methodology that allow us to work more with micro-data or other types of indicators (median, interquartile range, etc.). This is necessary in order to measure with greater accuracy the risk and vulnerability levels that are found in Basque firms and to discern more clearly in which groups investment and growth should be supported, and in which it is better to focus on adjustments and a return to equilibrium. Once again, Basque governments must be aware of the need to have access to these types of assets and that their nature should be for the 'public good', which means that they can only be developed with their support.

[19] For example, the data on key variables published in official statistics (GVA, employment, etc.) are not available for the clusters approved in the Basque Country. There are not even data available for the categories that, in theory, are based on traditional ones (such as R&D expenditure by area of activity). On the other hand, the legal formulas adopted by some entities misrepresent the situation reflected in the statistics so that very basic questions remain unanswered, for example, whether the intensity of R&D spending in the Basque manufacturing sector is higher or lower than that of its European competitors (or rather, even though the data are available, they are not comparable to data from other areas).

To achieve this learning-oriented strategic intelligence, they must go beyond merely having access to data. These must be properly interpreted, something that cannot be separated from taking policies and power into account. Institutions, forums and processes to analyse and communicate these data are required to provide a reasoned argument, which would redirect the discussion on strategic intelligence towards how to apply the strategy and policies.

It is necessary to go beyond the data and to generate spaces and processes which allow information to be transformed into strategic knowledge

In short, it should be understood that creating the necessary data and information — as well as institutions, forums and processes in which these are analysed, discussed and communicated — is key for the development of regional strategic intelligence and for suitable regional strategy and policy design. This is why an effort should be made to equip the corresponding bodies with the necessary resources, within a defined plan that includes the participation of the government and the main stakeholders (users or recipients of this type of information) who are aware of these new needs.

How to implement strategy and policies

In general, when governments propose strategies, they tend to define their content, but they do not stop to think about how they will be implemented or who will do so. But these two aspects (how and by whom) must be taken into consideration from the beginning of the process of designing strategy and policies, without waiting for the content to be final.

Strategy and policies should not be confused, nor should regional strategy be confused with government strategy, nor should having a strategy be confused with having a plan. In this sense, we must go beyond a 'cohesion plan' and incorporate the visions of other actors or stakeholders to move from a government strategy to a regional one. Although there are structures in the Basque Country that meet the requirements of the new models of governance, the processes that must be set up by these move slowly and lack the initiative to organise the existing initiatives and build a shared vision of the strategy. Moreover, with regard to the government's plans, in general they have counted on the participation of different stakeholders for consultation or comparison during the design phase of the plan, but without always having processes for collaboration, learning and negotiation among the different stakeholders or without considering their actual involvement in the implementation and evaluation phases. In this regard, there has been no leap from a Basque Government strategy and a few plans for a shared regional strategy. Building outwards governance models requires both innovation in the way in which the government relates to different stakeholders (social innovation or new governance) and public innovation (internal organisational innovation of the government, etc.). In short, it requires an entrepreneurial state (Morgan, 2014; Mazzucato, 2011).

It is necessary to move from a government strategy to a regional strategy

At a more specific level, the analysis of the three priorities also shows that there is no standard formula or standard methodology for their development. The analysis indicates that as the types of diversification vary (for example, ground-breaking or incremental, short- or long-term periods or actions, based on scientific or engineering knowledge), so too do the organisations designated to act on the priorities (pre-cluster, cluster association, platform, etc.), the government bodies that are responsible for them, the public administrations that are involved (departments

and territorial levels) and the required policy tools, etc. The situation is plural, complex and changing, and thus requires varied and flexible answers. Recent progress discussed in the literature and in international experience provides lessons that, with some adaptation, can be applied to the Basque context, or can help us to think about our own formulas for the region. In the case of the renewal of the cluster policy proposed by the current government, this progress and international experience has been considered. However, there are still other spheres in which this type of learning would be of interest, for example, for the different government agencies.

The most qualitative analysis of the three priorities also shows the inability to limit the wide variety of entrepreneurial discovery processes to a few predetermined types. Even when analysing a single priority, such as the biosciences, we can observe that entrepreneurial discovery varies from one value chain to another (time frames, investment, type of expertise required, etc., vary greatly between a pharmaceutical product and a bio-detergent for industry). It also varies depending on the origin of the entrepreneurial process (whether 'science-push' or 'demand-pull'), on the type of diversification concerned (radical foundation of new biotech companies, machinery suppliers extending into the health care market, modernising food companies by making them users of bio products, etc.), on the size of company that seeks to address its entrepreneurial discovery, etc. In this regard, although efforts have been made to involve some key actors from the innovation system helix (mainly knowledge organisations and firms), the participation of others (society and the financial world) has been almost non-existent. Public administrations have been key (particularly the Basque Government) and have played a direct and intense role in determining the three thematic priorities in the RIS3 and, although to a lesser degree, in the priority areas that are defined within each thematic priority. Nonetheless, in the real entrepreneurial discovery processes that lead to creating new areas of economic activity that enrich and transform existing ones, the government's function must be to support the creation of the conditions and spaces to allow these processes to take place. Its role is thus more that of a facilitator or catalyst.

The government must facilitate entrepreneurial discovery processes

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Glossary of acronyms

3E2020	Energy Strategy for the Basque Country 2020
ACE	Basque Energy Cluster
ACEDE	Basque Cluster Association of the Home Appliance Industry
ACICAE	Basque Automotive Cluster
ACLIMA	Cluster Association of Environmental Industries
AEAT	Inland Revenue (Spain)
APR	Annual Percentage Rate
B2B	Business-to-Business
B2C	Business-to-Consumer
BERC	Basque Excellence Research Centre
CAPV	Basque Country
CCAA	Autonomous communities
CNAE	National Economic Activities Classification
CRC	Cooperative Research Centre
DDEC	Department of Economic Development and Competitiveness
DF	Provincial Council
DIICT	Department of Industry. Innovation. Trade and Tourism
EBIT	Earnings Before Interest and Taxes
EFFRA	European Factories of the Future Research Association
EICT	Electronic. Information and Communications Technology
ERCS	European Regional Competitiveness Scoreboard
EVE	Basque Energy Agency
EU	European Union
FEAF	Spanish Federation of Foundry Associations
FMV	Basque Maritime Forum
GDP	Gross Domestic Product
GPN	Global Production Networks
GVA	Gross Value Added
GVC	Global Value Chains
ICT	Information and Communications Technology
IEA	International Energy Agency
INE	National Statistics Institute
INML	International Niche Market Leader
KET	Key Enabling Technologies
KIC	Knowledge and Innovation Communities
MAFEX	Spanish Railway Association
MCC	Mondragon Corporación Cooperativa
NLC	Nominal Labour Cost
NULC	Nominal Unit Labour Cost
OECD	Organisation for Economic Co-operation and Development
OEM	Original Equipment Manufacturer
PCT	Patent Cooperation Treaty
PCTI	Science. Technology and Innovation Plan
PECE 2018	2015-2018 Energy Cluster Strategic Plan
PPP	Purchasing Power Parity
PRO	Public Research Organisation

R&D	Research and Development
R&D&I	Research. Development and Innovation
RIS3	Research and Innovation Strategies for Smart Specialisation
ROA	Return on Assets
ROE	Return on Equity
RULC	Real Unit Labour Cost
RVCTI	Basque Science. Technology and Innovation Network
SAFE	ECB Survey on the Access to Finance of Enterprises
SIFE	Society of Hot Stamping Industries
SPRI	Basque Business Development Agency
T&D	Electricity Transmission and Distribution
TFP	Total Factor Productivity
ULC	Unit Labour Cost
UPV-EHU	University of the Basque Country
USA	United States
VMBA	Voluntary Mutual Benefit Association

Orkestra's collaborating entities

The Basque economy faces the continual challenge of moving forward in its productive transformation. However, are there any single recipes? Does it make sense to apply the same policies to firms, sectors or territories alike? Based on the Economy of Innovation, which argues that productive transformation requires tailor-made answers, the 2015 Basque Country Competitiveness Report looks into the competitive behaviour of the different realms on which policies for productive transformation are applied. For this it analyses the competitive situation of the Basque Country; delving into factors such as size or ownership that clearly affect the behaviour and results of firms; considering sectors and clusters and examining the three thematic priorities set by the PCTI-2020 (Basque Government's 2020 Plan for Science, Technology and Innovation): advanced manufacturing, energy and biosciences-health. Keeping in mind the importance of the territory in productive transformation processes, it also includes analyses on a provincial, county and municipal level. Lastly it positions the Basque Country with regards to the international state of the art in competitiveness policies, identifying critical challenges to assure that these policies are capable of effectively supporting the current and future strategies of the territory.

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