Orkestra
BASQUE INSTITUTE
OF COMPETITIVENESS
DEUSTO FOUNDATION

2020 BASQUE COUNTRY COMPETITIVENESS REPORT

RESILIENCE: BEFORE, DURING AND AFTER THE PANDEMIC

Deusto

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2020 Basque Country Competitiveness Report

Resilience: Before, during and after the pandemic

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2020 Basque Country Competitiveness Report

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Foreword

Since 2007, when Orkestra published its first Competitiveness Report, the Basque society has advanced and managed to reach a remarkable position of strength in relation to the context of European regions. Among others, its position in economic performance, low risk of poverty and high social inclusion indicators are particularly noteworthy. These advances do not detract from the fact that there are still areas for improvement, such as quality of employment, the incorporation of women and young people into the labor market, and the reinforcement of R&D&I.

In this context, we have been hit by the COVID-19 pandemic. This crisis is generating an enormous human and social cost, which is spreading to our economy, people and companies. Some of the characteristics of the current times include the huge uncertainty to which we will have to adapt, the unequal impact it has on the various sectors, the acceleration of the economic transitions it is generating, and the reconfiguration of the value chains in our economy.

Reacting to this reality is an individual and collective responsibility as a society. Orkestra, in its mission to support public and private actors in taking decisions with the best possible information, has taken up the challenge by strengthening and redirecting its analyses on the competitiveness and welfare of the Basque Country, and on the evolution of the factors that affect us.

The Competitiveness Report 2020 is a snapshot of the current situation that identifies the most relevant trends that will affect us in the coming months and in the context of the pandemic. These trends are generating threats to be managed and opportunities to be seized. The Basque Country is equipped with many assets to successfully face the current reality, since it has capable and talented people, a productive ecosystem of innovation and business, as well as fiscal tools. All this must be put to good use and action must continue as Europe's leading regions continue to make progress and devote substantial resources.

The future is in our hands and is being built day by day. That is why our commitment as Orkestra is to continue generating knowledge to tackle the challenges we face in the Basque Country and contribute to sustaining its competitiveness and socio-economic development.

Finally, we would also like to highlight the excellent work, involvement and commitment of all the people who are part of and collaborate with Orkestra, as well as the sponsoring institutions that support us. Without their support, Orkestra would not be a reality or an international benchmark in regional competitiveness.

Iván Martén Uliarte
Chairman, Orkestra-Basque Institute of Competitiveness
Deusto Foundation

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The Basque Country Competitiveness Report 2020 was produced with funding from SPRI, the Basque Business Development Agency, which reports to the Basque Government.

The Report has been prepared by a group of people coordinated by Susana Franco, Edurne Magro and James Wilson; the entire Orkestra team was also involved in a variety of ways, and we thank them for their collaboration throughout the entire process. We would also like extend our thanks for the contributions of the members of the Board of Directors and the Advisory Board, as well as Orkestra's sponsor institutions.

Calculation of the variables that form part of the Basque Country Competitiveness Observatory, on which this report is based, as well as preparation of other analyses in the same, was possible thanks to data provided by Eustat by means of purposeful and impartial exploitation of its databases at Orkestra's request. Our sincere thanks to Eustat for all the assistance provided. We would also like to thank Sabi-Informa, INE and ZEW for their collaboration in providing data for other analyses in the Report, and the support of the Basque Institute of Finance in applying financial analysis methodologies.

The digitisation analysis was carried out with the invaluable collaboration of ADEGI, BIC Araba, the Basque Country Maker Community, Comet, Dorlet, E Process Med, Erictel, Fegemu, Geminys, Grupo Berdin, Ibermática, Ikusi, Ingeniariak-Gipuzkoa College of Engineers, the Basque Country Digital Transformation Office, the Basque Country Network of Technology Parks (RPTE), Salto Systems, SENER, Sherpa. ai, Tecnalia, the Init Health, and Virtualware.

The comparative view of policies has benefited from the contributions of representatives of the Basque Government and SPRI in the Basque Country and Germany, Business Upper Austria in Upper Austria, the Fraunhofer Institute in Baden-Württemberg and a small sample of companies with establishments in one of the three regions (Basque companies established in Germany and/or Austria and vice versa).

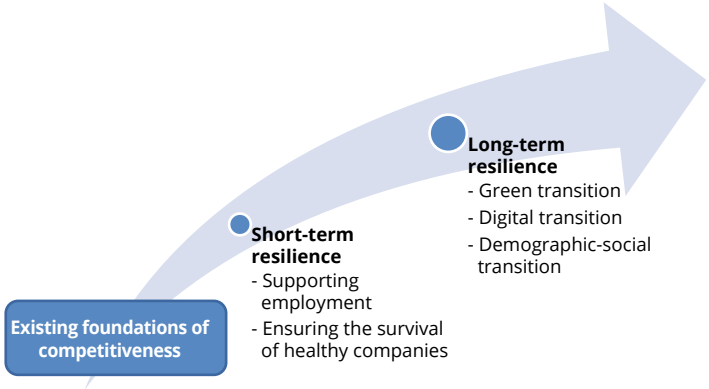
In addition, we would like to extend our thanks for the involvement of all the stakeholders who have participated and contributed to generating knowledge as part of the various projects carried by Orkestra in recent years.

Orkestra assumes full responsibility for any errors or omissions in the content of this report.

Executive summary

The COVID-19 pandemic and the measures implemented to combat it have caused a socio-economic crisis that is unique in its global reach, severity, and combined social and economic impacts. The Basque Country has experienced other crises in recent decades, in the context of which a resilient economy and society have been built. In this Report, we analyze that resilience: before, during and after the pandemic.

Building resilience is a long-term task, which requires working within different timeframes. In fact, the resilience of the Basque Country will depend on: (1) the foundations of competitiveness built thus far; (2) how the crisis situation is responded to in the short term; and (3) the ability to lead the fundamental transitions that will mark the way to sustainable competitiveness in the long term.



1. Foundations of Basque Country competitiveness prior to the pandemic: *From where did we start?*

The Basque Country ***entered the crisis in a strong position to face its impacts*** and to build resilience for the future. In 2019, it ranked very well across many of the key indicators of competitiveness in comparison with European regions and with the rest of the Spanish regions. Moreover, more than half of the indicators analyzed had improved with respect to the previous year. Particularly noteworthy are the result indicators, where the Basque Country is among the top European regions in GDP *per cap-*

ita and in the low *percentage of the population at risk of poverty or social exclusion.* This highlights the inclusiveness of the competitiveness model that has been developed.

The ***main challenge concerns employment***, especially in the context of a crisis that implies a new negative shock in this area. Despite positive developments in recent years, the long-term unemployment rate was still above most European regions in 2019. Furthermore, although job creation was increasing, job quality analysis shows high levels of temporality and undesired partial employment. The measures taken to counteract the impacts of the crisis should consider this situation, so that it does not end up affecting especially the most vulnerable groups.

The report also highlights **several strengths where further advances will be important to build the resilience of the future,** as well as some **areas for improvement, particularly with respect to the Basque Country's most comparable regions.**

- **Economic and financial position of the firms:** The healthy economic and financial position of Basque firms is an asset for resilience in the short term, although their greater use of working capital finance may become a threat in the medium term, as this type of financing is more susceptible to being reduced in times of crisis.
- **Skills:** The high level of qualification of the population can be taken advantage of to change, adapt and transform the economic model, especially if it is leveraged in an appropriate manner taking into account elements analyzed in the previous *Basque Country Competitiveness Report* (Orkestra, 2019). These processes of transformation and renewal are more difficult without a qualified population that is interested in further training to adapt their skills to a changing work environment.
- **Investment in R&D&I:** Priority should continue to be given to investment in R&D&I, increasing the expenditure made, in order to be able to react with the necessary innovations that will enable Basque firms to continue to keep abreast their competitors and to respond to the needs of the population. In particular, collaboration with actors abroad and between science and industry should be reinforced, and scientific and technological capacities should be better linked to the market.
- **Unit labor costs**: The slight advantage in unit labor costs in the manufacturing industry compared to Germany, and compared to other regions that are comparable in industrial structure, underlines the need to keep unit labor costs under control through productivity increases.
- **Internationalization:** The pool of exporting companies has increased, and the challenge is to further consolidate this pool by increasing both the percentage of companies that export regularly and the average volume of exports over turnover, and by growing presence in the most dynamic markets.
- **Digitization:** The advanced positioning in digitalization, especially in terms of connectivity and digitalization of business models of firms, as well as progress in terms of digital supply of public services, provides a good foundation from which to address the digital transition. It will be important to consolidate the use of digitized services in a world where electronic interactions are increasingly important, as well as to achieve greater and improved incorporation of women in the digital environment.
- **Energy ecosystem:** Strengths include the increasing diversification of fuel imports, as well as good results in access to and security of energy. The main challenges for

the energy transition are associated with greenhouse gas emissions in key sectors such as mobility and buildings, the need to make further progress in improving energy efficiency in general, as well as energy intensity in the industrial sector, and in achieving a diversification of primary energy sources more geared to the challenges of decarbonization.

2. Resisting the pandemic: *How have we responded in the short term?*

During 2020 the pandemic has had a strong impact on the economy, reflected in a severe drop in the industrial production index and a reduction in foreign trade activity, as well as an unprecedented fall in GDP and a rise in the unemployment rate. However, ***the impacts have been asymmetrical across sectors***, being particularly severe in the case of *Hotels and restaurants*, *Trade* and *transport equipment*, and severe, to a lesser extent, in *Metallurgy and metal products*, *Rubber, plastic and other non-metallic products*, *Construction*, *transport and storage*, *Recreational and cultural activities* and *Education*.

An important component of resilience is responses in the short term from the moment a shock occurs. The pandemic has been an extraordinary event, unknown to our generations, in which each firm, institution and person has had to respond to the impacts in different ways, many of them with radical changes in their day-to-day lives and also in their strategies for the future. Recognizing the high difficulty of dealing with this scenario, the analysis shows that in general ***the responses in the Basque Country in this immediate period of crisis have been swift and similar to those of other benchmark regions***.

The capacity for resistance in the short term has been supported by a solid economic and financial situation, in general, of Basque firms, together with good digitalization foundations. The first response to the health emergency meant that almost all activities had to be adapted quickly to completely new circumstances in which the potential of digital technologies came to the fore. ***An "express digital transformation" has been set in motion in many firms*** with respect to product (adaptation between the product and its demand), process (implementation of new processes), and/or channel (when the digital channel has been the solution for maintaining sales).

In terms of public policy, the Basque Country has given a very similar response to Baden-Württemberg and Upper Austria, two regions that share a similar productive structure, and therefore share challenges in facing the crisis. The measures in the three regions have focused on two main pillars: (1) sustaining the financial situation of firms to keep economic life going; and (2) supporting firms in the process of digitization to cope with the new context. In addition, other measures such as support for R&D projects for the management of the pandemic or specific sectoral support for those most affected, such as tourism and culture, stand out.

Given the high level of uncertainty regarding the evolution of the pandemic and the measures to counter it, the agility to resist and adapt 'here' and 'now' will be particularly important in the immediate future. It is imperative to ***continue to quickly adapt business behavior and policies in targeted support of improved competitiveness.*** Without agility or precision in response, the risk is that other regions and their busi-

nesses —perhaps less affected at different times by the pandemic— may get ahead of the curve.

This implies, on the one hand, that policy measures should consider the differentiating sector, for which it is important to ***expand upon diagnostic processes and sector intelligence.*** It is especially important to have better access to the data that the different administrations collect, but these secondary data must be complemented with the obtaining of strategic intelligence more immediately through dialogue with firms. For this reason, entities such as the Cluster Organisations or the County Development Agencies are critical allies for government when it comes to making strategic decisions.

On the other hand, the agility of response depends on the coordination of the actions of the various levels of government, adapting the actions to the specificity of each territory to guarantee the best coverage of its needs. In fact, one of the lessons learned from the health emergency has been the suitability of ***promoting models of co-governance*** that consider both the context and severity and complexity of the current crisis in each place.

Finally, short-term responses also play a role in building medium- and long-term resilience. In this sense, European and national policies establish a framework for a "green, digital and fair" recovery in which the regions have room to put forward their own strategies *(Next Generation EU)*. The large injection of funds foreseen for recovery and resilience in the following years under this framework represents a significant opportunity. But it will be particularly important to direct them towards investments, even in the short term, that seek to increase productivity and facilitate green, digital, and social-demographic transitions.

3. Post-pandemic resilience: *transition to a new sustainable competitiveness*

Moving from a phase of resistance to a phase of recovery implies taking advantage of the windows of opportunity that arise from all crises, and that can lead to a modification of previous growth trajectories. From an evolutionary perspective of resilience, these opportunities involve reorienting the economy, which means not returning to a previous state but instead, leading the ***search for a new model of competitiveness that is more sustainable and inclusive***. To this end, it is essential that all actors in the territory pull together to take advantage of the ***new opportunities surrounding the green, digital and demographic-social transitions***. In this regard, the Report identifies seven key recommendations.

1. ***Digitalization,*** **a transversal lever of resilience**
   The digital transition must be a lever to strengthen competitiveness in all sectors as well as facilitating green and demographic-social transitions. Although the DESI index places the Basque Country in a good position —especially in relation to connectivity, integration of technology in firms and digital public services— there are weaknesses in translating that into new digital business models in the private sector and into citizen demand for digital public services. Therefore, it is not only important to incorporate technology, but also to improve skills and competences in companies, government and society.

2. ***Sustainability,* an opportunity and competitive advantage**
   The green transition must be approached as an industrial and technological opportunity for the Basque economy, so that all sectors evolve their practices in ways that strengthen their competitiveness in an evolving context that demands and rewards sustainability. Above all, this means putting the strengths of the Basque Science, Technology and Innovation Network at the service of the green transition. In particular, actions related to the food system, the mobility system and the energy system will have a significant impact on the environment and on greenhouse gas emissions. It will therefore be essential to make investments in innovation in these areas.

3. **The *foundational economy,* a source of economic development**
   It will be important to contribute to the demographic-social transition by strengthening those parts of the economy that are essential to human well-being, such as health, food, education and care. The pandemic has highlighted the importance of the so-called 'foundational economy,' both for the well-being of the population and for the resilience of other sectors on which competitiveness policies have traditionally focused. Taking advantage of these synergies and working on the potential of the foundational economy as a source of opportunity for the economic development of the region is therefore a major challenge.

4. ***Skills,* a transversal lever of resilience**
   The processes of transformation and renewal that support resilience in the long term require the continuous development of the skills of the people in a territory. Therefore, it is necessary to act to ensure that the Basque Country has people with the necessary skills to promote the digital and green transitions from business, government and society in general. As analyzed in the previous *Basque Country Competitiveness Report* (Orkestra, 2019), it is particularly relevant to work on the agility of the skills ecosystem, adapting the different training modalities and attracting international talent.

5. ***Public administrations,* a catalyst for transition**
   With instruments such as investments, public procurement or the promotion of business collaboration platforms, public administrations will have to play a driving role in the generation of new solutions and innovations, new companies and business models, as well as the infrastructure needed to address the transitions. Likewise, they must become a digital, agile administration that is responsive to citizens.

6. ***Public-private collaboration,* towards an intelligent and sustainable strategy**
   The driving role of public administrations should be positioned in the context of a sophisticated public-private partnership, such as the one that has been developed through the Basque Country's smart specialization strategy (RIS3 Euskadi). It will be important to evolve this innovation strategy from a *Smart Specialisation Strategy* (S3) to a *Sustainable Smart Specialisation Strategy* (S4) that will serve as a lever for generating common projects oriented towards recovery and transitions, through existing public-private partnership mechanisms such as *Pilot Groups* and Cluster Organizations.

7. ***Co-governance,* through multi-stakeholder and multi-level collaboration**
   The ability to drive forwards digital, green and socio-demographic transitions will also depend on how the capacities and actions of multiple actors at multiple territorial levels are harnessed. This requires more effective governance, building on

existing relational structures to: (1) reinforce co-governance between the different administrative levels (local - regional - state - European), ensuring a clear distribution of roles that avoids duplication and takes advantage of synergies; and (2) ensure that the multiple territorial actors (firms, universities, technology centers, cluster organizations, etc.) play a relevant role.

In short, recovery requires reorienting the Basque economy by taking advantage of the opportunities provided by transitions. But also combining this medium- and long-term reorientation with short-term measures aimed at those firms and sectors with the greatest difficulty in recovering, but with potential for the future. All this without forgetting measures that protect the most vulnerable groups, thus mitigating situations of inequality.

In conclusion, resilience is a process of constant change in which different measures will have to be adapted and implemented at different times, in response to context and capacities, and the learning that is continually generated. In this sense, ***the Basque Country entered the pandemic with a series of strengths in its competitiveness fundamentals on which to build its responses. The measures adopted in the short term, at a time of great uncertainty and difficulty, have been rapid, flexible, and similar to other benchmark regions. However, the uncertainty of the pandemic remains for now, and in the coming months the key will be to combine resistance measures with a vision of investing in the transitions that will ensure the resilience of the Basque Country in the future.***

Introduction

2020 is an extraordinary year for analyzing and promoting competitiveness, both in the Autonomous Community of the Basque Country and in all other territories. The COVID-19 pandemic has provoked a socio-health crisis whose high human cost is spreading throughout the world. This crisis itself, and the measures put in place to combat it, have also led to an unprecedented global socio-economic crisis. In the context of a highly integrated global economy, supply chains have been badly disrupted. In addition, each territory has seen different combinations of supply and demand shocks related to containment measures, to the reorientation of resources to the health system, and to a generalized environment of high uncertainty (with its implications for consumption and investment).

Although this crisis is clearly unique in its global scope, seriousness and combination of social and economic impacts, the Basque Country has experienced other crises in recent decades in the context of which a resilient economy and society have been built. In fact, the model of 'competitiveness in solidarity' that characterizes the Basque Country had its origin in the deep industrial crisis of the 1980s. Focused on industry as a driver of the economy and strengthened by investments in science, technology and innovation, this model has proven its resilience over some 40 years. Most recently this is evidenced by a comparatively lower impact than that of other Spanish regions during the financial crisis of 2008[1] and a stable and balanced growth from 2014 onwards. The new scenario caused by the pandemic urges us to analyze this resilience and to reflect on the foundations that support it, along with the changes needed to maintain it in the future. For this reason, the focus of this 2020 Competitiveness Report is on resilience.

Analysis of the resilience of the Basque Country is timely in the context of a pandemic that generates enormous challenges

As was the case in the period after the financial crisis, the concept of resilience is very much in vogue today. However, it is a concept that can be interpreted from different perspectives. Although the concept has its roots in the Latin word *resilire*, which means to regress or bounce back, there are three main meanings of the concept in its contemporary usage.

[1] For detailed analysis of the resilience of the Basque Country, see among others: Aranguren *et al.* (2020), Cuadrado & Maroto (2016), Cueto *et al.* (2017), Holl & Rama (2016), Magro (2020) and Magro & Valdaliso (2019).

ILLUSTRATION Three meanings of resilience

Engineering	Ecological	Evolutionist
The ability of a system to return to the pre-disturbance equilibrium *(status quo)*	The ability of a system to persist in the face of change, finding new equilibria	The ability of a system to change, adapt and transform
Bounce back	***Bounce forward***	***Renovate and/or transform***

Source: Compiled by authors, based on Davoudi *et al.* (2013).

In the context of the profound structural changes that characterize our society in 2020, it is pertinent to focus above all on the third perspective, the evolutionary one. In this sense resilience is not a question of going back to where we were prior to the pandemic or simply coping with it as an external impact. It means being able to transform our competitiveness model continuously to take advantage of the opportunities offered by the major transitions —digital, green[2] and social-demographic— that we are experiencing.

The digital, green and social-demographic transitions are opportunities to transform our competitiveness

Although the pandemic has accelerated and/or changed the importance of some of them, these transitions were very much present prior to the pandemic. The green and digital transition were already defined as the two key levers of the European Commission's industrial policy (European Commission, 2020a) in the roadmap towards a sustainable Europe contained in the European Green Pact (European Commission, 2019). For its part, the Basque Government included three transitions —technological-digital, energy-environmental and demographic-social— in the strategic and economic bases of the new Science, Technology and Innovation Plan (PCTI) 2030 (Basque Government, 2019). These transitions were also implicitly recognized in the *Basque Country Agenda 2030* (Basque Government, 2018), the action plan to respond to the global challenge of achieving the 17 Sustainable Development Goals (SDAs) (United Nations, 2015).

In this context, the resilience of a territory is closely related to the capacity of its firms and institutions to adapt to major changes and social challenges in a spirit of transformation. In fact, in its first *Strategic Outlook Report*, the European Commission (2020b) marks resilience as a new compass for European policies and distinguishes four dimensions where policies can foster resilience: socio-economic, green, digital, and geopolitical. These four dimensions are clearly interlinked today —for instance, it is not feasible to promote economic competitiveness without considering the social contract or the ability of industry to go digital or become more sustainable— and point to the importance of policies capable of promoting adaptability.

Therefore, we understand the resilience of the Basque Country as the capacity to change, adapt and transform, both with respect to the effects of the pandemic and to the digital, green and social transitions that will mark sustainable development in the coming years. In this regard building resilience is a task for the long term; it is not something that can be built from yesterday to today, or from today to tomorrow.

Building resilience is a long term task

[2] The term green transition is used to refer to the transition to a more environmentally sustainable economy and society, which includes the energy transition as an important element.

As noted in the first article published by Orkestra in the COVID-19 reflections series in April 2020 (Wilson *et al*., 2020), the socio-economic crisis caused by the pandemic can be conceptualized in two phases: one of resistance, and another of reconstruction and renewal. However, when these two phases are related to the concept of resilience, the boundaries between them are blurred. In the resistance phase the immediate focus is on short-term resilience, or our ability to change, adapt and transform during the pandemic to safeguard our socio-economic activity. But in turn this short-term adaptation, together with the characteristics and trajectory of our system prior to the pandemic, helps lay the foundation for the reconstruction and renewal needed to be resilient in the long term.

The report is structured around analysis of the past, the present and the future

The Report is therefore structured through its four chapters around analysis of the past, present and future.[3] The first chapter uses the framework employed in previous Basque Country Competitiveness Reports to analyze its pre-pandemic competitiveness foundations. After a general presentation of the positioning and variation of the Basque Country in competitiveness indicators, using the most recent data available, the chapter looks in depth at three elements where particularly important messages are emerging: (1) employment, living conditions and inequality; (2) business behavior and performance in various areas; and (3) energy and digital transition.

The second and third chapters are focused on the present, and the resistance to the pandemic in the Basque Country. The second chapter analyzes this resistance from the perspective of impacts, with respect to the situation in general and specifically focusing on the asymmetric vulnerability of different sectors. The third chapter analyzes resistance from the perspective of responses. On the one hand, it considers the responses of firms around digital transition, which has been accelerated in certain aspects by the pandemic. On the other hand, it focuses on the policies implemented in response to the pandemic, both in the Basque Country and in other regions that share similar features in their industrial structures.

Finally, by way of conclusions, the fourth chapter turns to the future and reflects on what is needed to promote resilience from now on. Based on the analysis of the previous chapters, previous Competitiveness Reports, and current reflections within various projects with stakeholders (both in the Basque Country and internationally), we propose a series of recommendations. These recommendations are aimed at building on the foundations of resilience already achieved in the Basque Country, resisting and adapting to the immediate challenges of living with the pandemic, and leading the transitions needed to achieve better and more sustainable competitiveness.

[3] The analysis of the report is partly built on a series of 4 background papers that have been progressively developed and published during 2020 as part of the *COVID-19 Regional Competitiveness Observatory* established by Orkestra to support public policy makers in the context of the pandemic: Magro *et al.* (2020); Retegi *et al.* (2020); Wilson *et al.* (2020); and Zubillaga & Peletier (2020).

1
The competitiveness of the Basque Country before the pandemic

1.1 Positioning and variation of the Basque Country in competitiveness indicators

The competitiveness framework is organized into four levels

This section summarizes the situation in the Basque Country before the start of the pandemic. To this end, it presents its position and variation in a range of competitiveness indicators grouped according to the competitiveness framework developed by Orkestra and which has been used in previous Competitiveness Reports (Illustration 1.1). The framework is divided into four levels indicating the various factors which determine regional competitiveness:

1. **Outcome indicators**. These are the overall goals to be achieved in terms of citizen wellbeing. They include economic indicators, such as per capita income, as well as other, broader elements related to social cohesion.

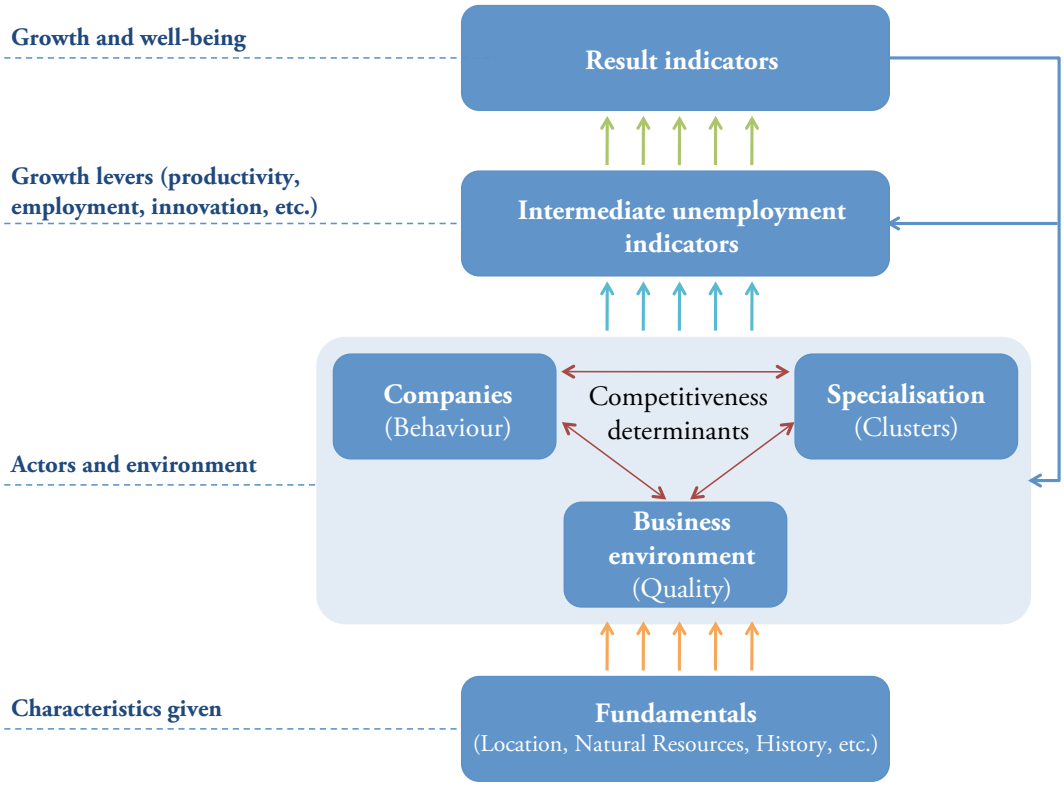
2. **Intermediate performance indicators**. While these are not the overall aims to be achieved by the region, they are important to achieving the final outcomes. They comprise indicators related to employment, productivity and innovation.

3. **Determinants of competitiveness**. These are the elements that impact the results for the two levels above. This level is particularly important because it is where policies can have a more obvious impact. The determinants are grouped into three categories that reflect the behaviors of firms, the specialization of the territory and its clusters, and the quality of the business environment.

4. **Endowments**. These refer to certain characteristics of the territory that 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.).[4]

[4] As these characteristics have been analyzed in previous reports, they are not included in this report (although they have been used, together with the productive structure, to identify a group of regions most comparable to that of the Basque Country).

ILLUSTRATION 1.1 Framework for competitiveness



Source: Compiled by authors.

Table 1.1 shows graphically the situation of the indicators analyzed in this framework, comparing the Basque Country with the rest of the European regions, a group of comparable regions, and the Autonomous Communities of Spain.[5] Appendix 1 shows the values of each of the indicators in the Basque Country, the EU-28, the comparable regions, Spain and Germany, and Appendix 2 shows their variation over time. Appendix 3 also contains an analysis of the ranking of the Basque Country in these indicators with respect to European regions, comparable regions and the regions of Spain.[6]

As Table 1.1 indicates, the situation of the ***final outcome*** indicators was very positive in the last year available, with the Basque Country positioned in the top 25% of the rankings in most indicators and, in general, improving or maintaining positions with respect to the previous year in addition to improving in absolute terms. The only exception is the indicator of long-term unemployment. Despite the positive variation maintained in recent years (from 9.7% of the active population in 2014 to 3.7% in 2019), it is still in the lower half of the ranking of European re-

The Basque Country is situated in the top 25% of regions in most of the outcome indicators

[5] Given the United Kingdom's situation of transition in the European Union, this chapter, which analyzes the situation up to the end of 2019, establishes the comparison with the EU-28 and therefore includes the regions of that country in the comparison. In the next chapter, which analyzes short-term indicators, the European comparison is made with the EU-27.

[6] The data and graphs can also be consulted at Orkestra's Basque Country Competitiveness Observatory, which is updated periodically: https://www.orkestra.deusto.es/competitiveness-observatory-eustat/es/ES21/dashboard. Details on the group of comparable regions can also be found at the Observatory.

gions and in the lower quartile of comparable regions; this is not the case with the Autonomous Communities of Spain, where it is in a more favorable situation. It should also be noted that, despite the fact that the Basque Country continues to be at the top of the ranking in terms of population at risk of poverty or exclusion, the indicator, which showed a downward trend in recent years, increased from 12.1% to 14.4%. The next section looks at some other indicators related to poverty and inequality.

Although employment has been generated, the gap with other European regions has not been closed

The evolution of the ***employment*** indicators considered when analyzing intermediate performance is generally positive and employment continued to be generated at a higher rate than in other regions, which allowed some positions in the rankings to be increased. However, it has not been possible to eliminate the gap with other European regions, especially the group of regions that have an industrial structure more similar to that of the Basque Country. Particularly noteworthy is the case of youth unemployment (20.8% in the population aged 15-24) for various reasons. The first is that in absolute terms it doubled the unemployment rate of the whole population (which was below 10%). The second is that, after several years with a downward trend, for the last two years this trend seems to have stagnated and the rate even increased slightly last year. Finally, the third is that the Basque Country lost several positions with respect to other regions (ten in Europe as a whole and two with respect to similar regions), which indicates that in other territories this indicator had indeed followed a downward trajectory. The analysis of employment is completed in the next section, with a more detailed look at aspects that have to do with its quality, since it is not only a question of continuing to generate employment but also of ensuring that this employment is of good quality.

As for the other intermediate performance indicators analyzed, the ***migration balance*** continued to improve and shows a region that was attracting population, as a result of the improved economic situation. Linked to the good performance of GDP per capita, ***productivity*** (measured in purchasing power parity) continues to be at the top of all the rankings considered, and this is a topic that will be addressed later in this chapter.

In terms of ***innovation*** performance, comparisons with European and comparable regions show better results in terms of publications than in terms of patents. In the latter, which is one of the most common indicators for measuring technological output despite the limitations it presents (since it is more prevalent in some sectors than in others and firms use alternative ways of protecting their intellectual property), there has been a slight deterioration in the rankings that already started from an intermediate situation with respect to the European regions as a whole and even worse with respect to comparable regions. In publications, on the other hand, positions are somewhat better and the trend has continued to be positive. The quality of the publications (measured by their position in the first quartile in terms of their impact factor) also stands out for its good position in the rankings, even taking into account its fall with respect to all European regions last year. This is a consequence of the firm commitment that has been made for some years now to improve the scientific system.

Moving on to the determinants of competitiveness, in terms of collaboration for innovation the indicator on patent co-invention highlights a challenge of collaborating abroad to produce a greater flow of international knowledge. The low position in

the rankings with respect to publications in cooperation with industry also reflect a challenge in terms of greater collaboration and transfer of knowledge between the worlds of science and industry.

However, the Basque Country maintains a relatively good position in the indicators of R&D inputs, especially as regards personnel. Nevertheless, despite remaining in the top half of the rankings, it should be noted that public R&D expenditure fell slightly, that in most of these indicators some positions have been lost in the European context, and that total R&D expenditure stands at 1.85% of GDP, below the European average of 2.11%. Coping with the consequences of the pandemic will require continuing to maintain high levels of R&D inputs to enable the region to continue to innovate and maintain competitiveness. Linked to this topic, the third section of this chapter analyzes the innovative behavior of firms.

The Basque Country has a high percentage of qualified people

The ***education*** indicators show a good position in relation to younger people, with high percentages in both tertiary and vocational education, which helps to correct the worse position in the indicator that measures the percentage of the population aged 25 to 64 with secondary and tertiary education, since in the older strata of the population there is a greater percentage of the population that has not achieved at least a secondary level of education. The emphasis on tertiary education results in a high rate of over-qualification (ratio of people with tertiary education to the population employed in the most skilled occupations). This indicator can be assessed negatively from an efficiency perspective, because it indicates that there are resources that are not being used. However, education has important impacts on individuals and society that go beyond the labor market. Furthermore, from a resilience and adaptability perspective, it can also be interpreted positively, as an indication that there are people who have the necessary skills to access more qualified jobs that generate more added value. To be able to access these jobs, it is important that training opportunities is not limited to the formal training usually acquired in the early stages of life. It is therefore important to mention that in the continuous training indicator the Basque Country is above the EU-28 average (13% and 11.3% respectively), but not very well positioned with respect to comparable regions.

Finally, the indicators for which there are regional comparisons of ***digitization*** (household access to broadband and online purchases) show an intermediate situation in the former and a low situation in the latter. Although this will be addressed in more detail in the fourth section of this chapter, where both the digital and energy transitions will be analyzed, the situation should be expanded upon here a little more. The broadband access indicator shows a growing trend in all territories over the last decade and almost all territories have a coverage rate of around 90%, so a few tenths of a difference can mean big jumps in the rankings, without being too significant. The indicator for Internet purchases does seem to show that the Basque Country is below the European average. This behavior is likely to have been altered by the pandemic across Europe so it remains to be seen whether the indicators show a significant change from next year. In any case, this indicator may be indicating that the Basque population has a greater tendency towards 'buying locally', which has positive nuances.

TABLE 1.1 Ranking of the Basque Country in competitiveness indicators

	Indicator	Year	Ranking in comparison with ...				Difference in ranking, compared to the previous year, for...		
			...all European regions	...compara-ble regions	...Spanish aut. comm.	Value	...all European regions	...comparable regions	...Spanish aut. comm.
			Most recent	Most recent	Most recent	Δ	Δ	Δ	Δ
Outcomes	GDP per capita (PPP)	2018	29	4	1	↑	2	0	1
	Household disposable income per capita (PPP)	2017	25	6	1	↑	0	0	0
	Long-term unemployment (% lab. force)	2019	162	29	6	↑	4	1	–1
	NEET rate (% pop. aged 15–24)	2019	78	9	1	↑	22	5	5
	Population at risk of poverty or social exclusion (% total pop.)	2019	26	3	2	↓	–16	–1	–1
Intermediate performance	Employment rate (% pop. aged 15–64)	2019	131	27	7	↑	–6	–1	–1
	Female employment rate (% pop. aged 15–64)	2019	119	26	4	↑	–5	0	0
	Unemployment rate (% lab. force ≥ 15 y.o.)	2019	164	28	2	↑	2	0	1
	Youth unemployment rate (% lab. force aged 15–24)	2019	147	26	1	↓	–10	–2	0
	Relative net migration (% total pop.)	2018	40	9	9	↑	31	6	–3
	Apparent productivity per employee (thousands, PPP)	2018	7	2	1	↑	–1	0	0
	PCT patents per million inhabitants	2017	96	30	4	↓	–2	–2	–1
	Publications (WoS) per million inhabitants	2019	72	20	7	↑	7	1	0
	Publications in Q1 (% publications)	2019	26	6	5	↓	–12	–2	–1
Determinants of competitiveness: Firm performance	Firm R&D personnel (% employment)	2018	14	4	1	↑	–1	0	0
	Firm R&D expenditure (% GDP)	2018	44	14	1	↑	–4	–2	0
	PCT patent co-invention (4-year window) (% patents)	2017	79	18	5	↑	25	3	2
	PCT patents with foreign collaboration (4-year window) (% patents)	2017	164	25	11	↑	10	4	–1
Determinants of competitiveness: Specialisation	Employment in high- and medium-high-tech manufacturing (% employment)	2019	31	4	2	↑	2	0	0
	Employment in knowledge-intensive services (% employment)	2019	113	25	4	↑	–1	0	0
Determinants of competitiveness: Business environment	Human resources employed in science and technology (% total pop.)	2019	112	28	3	→	–2	–1	–1
	Population aged 25–64 with upper secondary or tertiary education (% pop. aged 25–64)	2019	156	27	2	↑	–3	0	0
	Tertiary education students (% pop. aged 20–24)	2018	23	3	5	↑	–1	0	0
	Overqualification index (%)	2019	215	31	18	↓	–1	0	0
	Vocational education and training students (% pop. aged 15–19)	2018	48	8	4	↓	–3	1	–1
	opulation enrolled in continuing education (% pop. aged 25–64)	2019	71	26	1	↑	3	0	1
	Public R&D personnel (% employment)	2018	69	13	5	↑	3	0	0
	Public R&D expenditure (% GDP)	2018	113	19	11	↓	–6	0	–2
	Total R&D personnel (% employment)	2018	22	4	1	↑	–3	0	0
	Total R&D expenditure (% of GDP)	2018	57	12	1	→	–2	0	0
	Publications with international cooperation (% publications)	2019	97	22	3	↓	–23	–4	0
	Publications with industry cooperation (% publications)	2019	163	30	11	↑	–3	0	–1
	Households with broadband access (% households)	2019	64	20	7	↑	–13	–6	–3
	Individuals that make online purchases (total pop.)	2019	159	31	17	↑	1	0	0

	...all European regions	...comparable regions	...Spanish aut. comm.	...all European regions	...comparable regions	...Spanish aut. comm.
Q1	1-55	1-8	1-5	↑ >10	↑ >5	↑ >3
Q2	56-109	9-16	6-10	↑ 1-10	↑ 1-5	↑ 1-3
Q3	110-163	17-23	11-14	=	=	=
Q4	164-218	24-31	15-19	↓ 1-10	↓ 1-5	↓ 1-3
				↓ >10	↓ >5	↓ >3

From the analysis compared to other regions, it can be concluded that, in general, the Basque economy shows a positive evolution over the last year in most indicators. This suggests that it started off in a strong position to deal with the impacts of COVID-19, although it should be noted that the situation is more favorable when compared to the rest of the Spanish regions and to all the European regions than when compared to regions with a similar industrial structure. Some elements of particular relevance for understanding the baseline situation at the beginning of the pandemic are discussed in more detail below. On the one hand, the employment situation and its characteristics are studied in depth, which allows the identification of strengths and weaknesses of the labor market that will be stressed as a consequence of the deep crisis, as well as an analysis of quality of life and inequality indicators to assess what the starting situation was, but also the effect that the 2008 crisis had on people with different income levels. On the other hand, the situation of the business fabric is analyzed with the aim of identifying its capacity for resistance in the short term and resilience in the long term. Finally, an assessment is made of the current state of two of the main transitions that will be accelerated in the coming months, the energy transition, and the digital transition.

The Basque Country has strong competitiveness foundations to face the impacts of the pandemic

1.2 Employment, living conditions and inequality

In the previous section, mention has been made of the job creation that was being generated and the need to continue generating it. In this regard, Graph 1.1 shows the variation of several quality of employment indicators, disaggregated by gender. The first graph measures the percentage of self-employed persons (business owners without employees or independent workers) and people who work in family businesses within the working population. It is included as a quality indicator because their working conditions are often not equal to those of wage earners. Fewer people in the Basque Country have these types of occupation than in Spain and the EU-28, but more than in Germany. They are also more prevalent among men than among women and show a downward trend since 2013.

It is important to keep generating employment of quality

The second indicator has to do with the stability of contracts. Temporary contracts are clearly more prevalent in Spain and the Basque Country than in Germany and the EU-28 and are more prevalent among women than men. Temporality has been increasing in recent years and, although there was a slight decrease last year, by 2019 it was at 26.5% for women and 22.1% for men. These percentages were slightly lower in the private sector (22.2% and 20.7% respectively), although still well above the European average, which is below 15% for both genders. In the public sector the percentages are as high as 40.6% for women and 30.4% for men.

However, the permanence in the workplace indicator offers an alternative image, since the Basque Country presented for several years a lower percentage of jobs lasting less than one year than the rest of the territories considered. In recent years, the percentage of jobs of this duration has been approaching the German and European average. This seems to indicate that, despite the high degree of temporality, some of these contracts could be running for more than a year. This has negative effects both on people (in terms of insecurity and instability), and on key competitiveness factors (e.g. training expenditure) that lead to lower productivity and innovation. The Basque

There is a duality in the labour market between long-term employment and high temporailty

Country also stands out (as can be seen in Table 1.2) for the high percentage of persons with a duration of employment of more than sixty months. This suggests a situation of duality, where part of the population has long-term employment and another part high temporality.

TABLE 1.2 Permanence in the workplace (2019)

	Men				Women			
	0-11 months	12-23 months	24-59 months	More than 60 months	0-11 months	12-23 months	24-59 months	More than 60 months
Basque Country	12.9	7.4	15.1	64.7	14.3	7.6	13.4	64.7
UE28	13.5	9.6	16.9	58.9	14.7	10.1	17.2	57.0
Spain	17.4	9.0	15.5	58.2	18.2	9.2	15.2	57.4
Germany	13.3	10.0	15.7	58.1	14.1	10.2	16.9	55.9

Source: Eurostat.

Employment precarity is higher among women than men

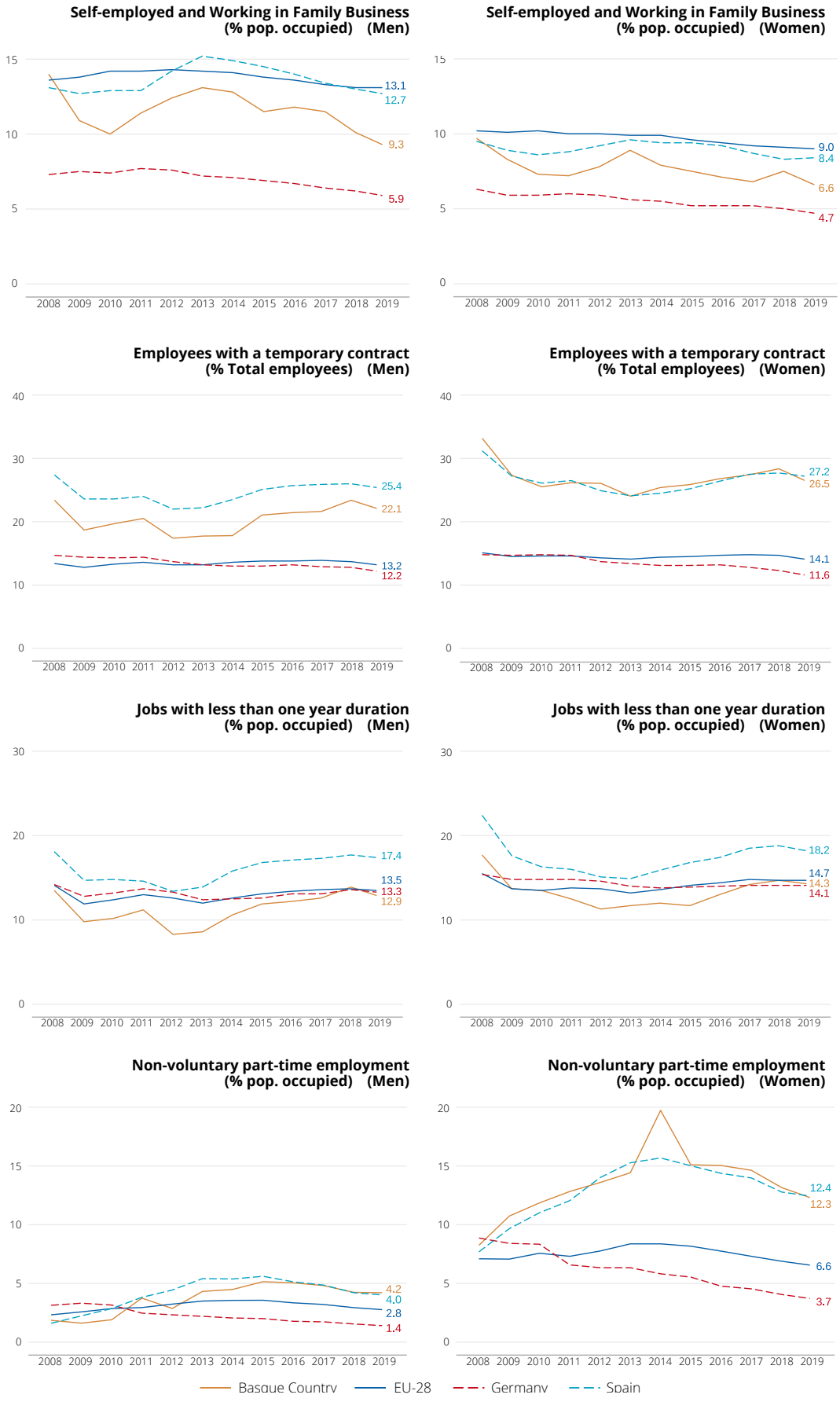
Finally, the last quality of employment indicator shows the percentage of the population working part-time on a non-voluntary basis, in other words those people with part-time contracts who claim that they cannot find full-time employment. This indicates a higher level of precariousness than in Germany and the EU-28, and not far from the pattern in Spain. Moreover, this kind of situation is more prevalent in women: in 2014, it stood at almost 20% and, although it has been falling in recent years, it was still above 12% in 2019, twice as high as the average for women in Europe and three times as high as men that same year.

Groups with precarious employment are in a worse position to face the impacts of the pandemic

The combination of all the employment indicators shows a situation in which it had been possible to maintain stable employment in part of the population, but that new employment generated had a high component of temporariness and undesired part-time work, and that these precarious conditions affected women to a greater extent than men. It is these groups with the most precarious jobs who can most easily see their jobs lost due to their temporary nature and who start out in worse conditions because they are employed part-time on a non-voluntary basis. If these jobs are lost as a result of the pandemic or other trends, the living conditions of the population may deteriorate. In this sense, Graph 1.2 adds to the information available in the regional comparison with some indicators that enable some aspects of the economic conditions of the population to be expanded upon.

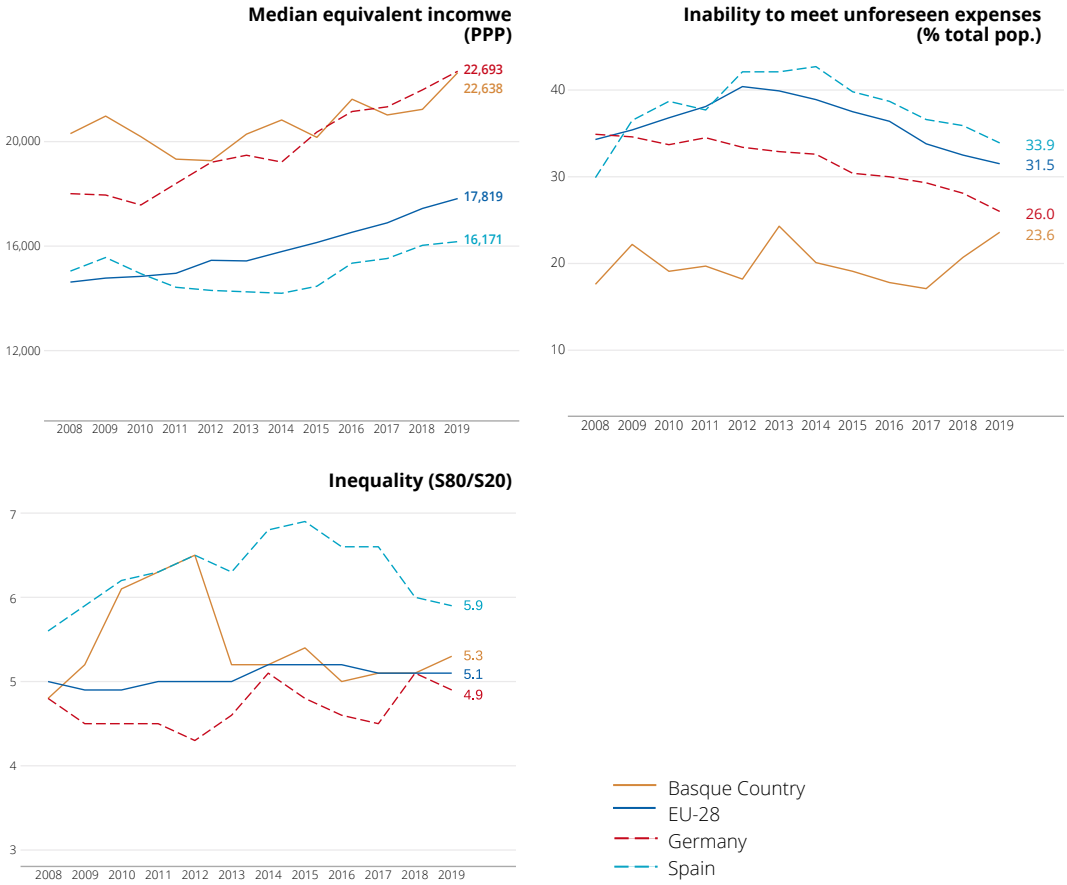
Median income is a better representation of standard of living than average income, because if high-income groups have very high values, the average values may be quite a bit higher than the respective median values. The values of this indicator confirm the high average standard of living, which is close to that of Germany. However, in line with what has been said about the poverty or exclusion rate, the indicator of inability to meet unforeseen expenses, despite being better than in the rest of the territories considered, has increased considerably in the Basque Country over the past two years, closing the gap with other places. This situation may be further aggravated by the pandemic.

GRAPH 1.1 Job quality



Source: Eurostat, INE (Spanish National Statistics Institute). Compiled by authors.

GRAPH 1.2 Economic conditions



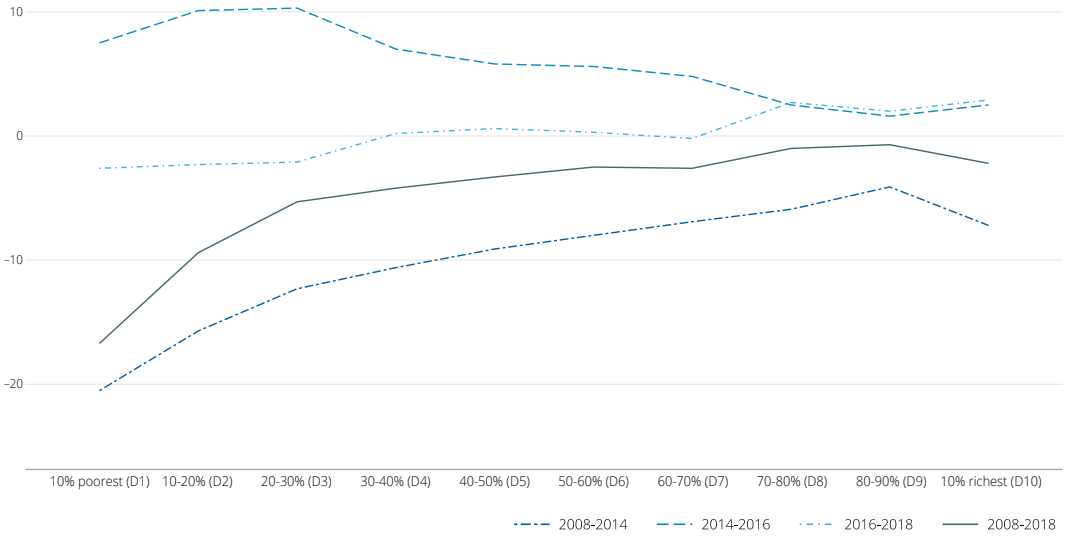
Source: Eurostat, INE (Spanish National Statistics Institute). Compiled by authors.

Finally, in terms of income distribution, the S80/S20 index (which measures the ratio of the top 20% of people in per capita income to the bottom 20%) rose again slightly last year, after falling to levels approaching those of Germany following the 2008 crisis. It is therefore worth analyzing in a little more detail what has happened since the last crisis of 2008 with the distribution of the population's income.

It is important to ensure that those in the lowest income groups do not see their purchasing power reduced

Graph 1.3 shows the change in average per capita equivalent income by income decile in constant terms. Several periods are observed. The first, between 2008 and 2014, reflects the most immediate consequences of the crisis, with a general fall in income that was more intense the lower the income level. In other words, the poorest suffered the most. In the second period, between 2014 and 2016, incomes increased across the board, and did so to a greater extent among those with lower incomes. This is the only period when inequality decreased. Finally, between 2016 and 2018 incomes fell again among the lower income strata, remained fairly stable in the intermediate strata, and increased in the higher strata. As a result, it can be seen that by 2018 none of the income levels had recovered the real average income levels of 2008, and it is the lower income strata that have seen their purchasing power decrease the most. It is important to try to prevent this situation from recurring in the face of the current pandemic.

GRAPH 1.3 Change in average per capita equivalent income by income deciles (%, constant prices 2016)



Source: Poverty and Social Inequalities Survey (PSIS) 2008-2016 and Social Services Demand Statistics-Social Needs Survey (SSDS-SNS) 2014-2018.

1.3 Situation of the business fabric: Behavior and performance

This section presents various aspects of the behavior and performance of firms in terms of innovation, internationalization, financing, labor costs and productivity.

1.3.1 Innovation

The definition of business innovation is based on the Oslo Manual (OECD/Eurostat, 2019), which has recently been amended (as explained in Appendix 4). This resulted in a break in the innovation survey time series, which does not allow a comparison of 2018 results with previous years. The analysis is therefore limited to comparing the data from the Basque Country and Spain, through their respective innovation surveys. The comparison includes, in some cases, Germany, whose data have been provided by the *Centre for European Economic Research* (ZEW).

Table 1.3 includes the innovative behavior of firms with ten or more employees, distinguished according to the sector (industry and services)[7] and firm size. Starting with the type of innovation, the percentage of firms in the Basque Country with some type of innovation (38%) is higher than in Spain (28%) but significantly lower than in Germany (64%), with innovation being somewhat higher in industry than in services, and significantly higher in large firms than in small ones. In terms of the type of innovation, the comparative disadvantage of the Basque Country with Germany lies in

[7] The whole industry is included (B: Extractive industries, C: Manufacturing industry, D: Supply of electricity, gas, steam and air conditioning and services, and E: Water supply, sewerage, waste management and decontamination activities) and the part of the services most related to industrial activity (46: Wholesale trade and agents; except of motor vehicles and motorcycles, H: Transport and storage, J: Information and communications, K: Financial activities and insurance, 71: Architectural and engineering technical services; technical testing and analysis, 72: Research and development).

The main innovation gap is among small firms

both products and processes (which incorporates both innovation in production processes, and organizational and marketing innovation). The product disadvantage is mainly for small firms, as in the case of medium and large firms the distance to Germany is significantly reduced.

In terms of the economic impact of product innovation, the proportion of sales from unchanged or slightly modified products is similar across the three territories, and it is the large firms that have the highest proportion of sales from innovative products. In the case of the Basque Country, the difference between industry and services is not as marked as in the other territories, with the percentages of sales of innovative products being very similar.

Turnover in the Basque Country from innovative products is more than one point higher than in Germany for products new to the market (4.8%), but lower than in Spain. However, sales of new products for the firm (10%) are lower than in Germany, also by more than one point, although higher than in Spain. In terms of business size, small, medium and large Basque firms show better innovative behavior, except in the specific case of sales of new products for the market by large firms, which do not exceed those of Spain.

The intensity of R&D spending in small Basque firms is similar to their German counterparts

The results with respect to innovation expenditure show that there is a positive relationship between spending on innovative activities and innovation, meaning that where there are higher proportions of firms with innovation expenditure, higher ratios of innovative firms are observed. Expenditure on innovative activities accounts for 2.4% of turnover in the Basque Country, compared with 1.3% and 3.4% in Spain and Germany respectively, which indicates that the intensity of expenditure on innovation by Basque firms is greater than that of Spain as a whole, but does not reach that of German firms. In the Basque Country, the service sector is more intensive than the industrial sector, unlike in other territories, especially Germany. This is due to the accounting of technology centers and disaggregated R&D units, whose weight is also reflected in medium-sized firms. It should be noted that the proportion of turnover devoted to innovation expenditure in small Basque firms is almost comparable to that of German firms. As regards the type of expenditure on innovation, in the Basque Country as in Spain, more than half is allocated to internal R&D.

Cooperation in innovation is significantly more widespread among Basque firms than among Spanish firms, with almost 17% of them cooperating in R&D activities and another 10% in other innovation activities. Industrial firms cooperate in R&D firms more than service, while in cooperation in other innovation activities the service sector exceeds the industrial sector.

In summary, it can be concluded that Basque firms are more innovative than Spanish firms and less innovative than German firms, but there are some significant differences when comparing with the latter. Although the percentage of German innovative firms is higher in both industry and services, Basque service firms show some better results than their German counterparts, as they report a higher percentage of sales for products that are new to both the firm and the market. This may be a result of their increased spending on innovation. Thus, although industrial firms are more innovative than service firms, the latter are more innovative than those of the German benchmark.

TABLE 1.3 Percentages of firms with 10 or more workers innovating (2018)

		Total			Industry			Services			Small			Medium			Large		
		Basque Country	Spain	Germany	Basque Country	Spain	Germany	Basque Country	Spain	Germany	Basque Country	Spain	Germany	Basque Country	Spain	Germany	Basque Country	Spain	Germany
Type of innovation	Innovators (%)	38.0	28.0	64.0	39.0	30.0	66.0	37.0	26.0	62.0	33.0	25.0	59.0	59.0	42.0	75.0	75.0	62.0	84.0
	Product innovators (%)	25.0	15.0	40.0	23.0	17.0	43.0	26.0	12.0	37.0	20.0	12.0	36.0	43.0	35.0	47.0	61.0	55.0	66.0
	Process innovators (%)	34.0	24.0	55.0	35.0	25.0	58.0	33.0	23.0	53.0	30.0	21.0	51.0	52.0	35.0	66.0	65.0	55.0	77.0
Level of novelty	Sales unchanged products (% of total firms)	85.0	85.5	85.2	84.8	81.8	80.7	85.6	93.2	90.5	91.5	95.4	94.2	82.7	91.4	92.4	79.7	78.5	81.4
	Sales new—to—firm products (% of total firms)	10.1	7.5	11.3	10.2	9.0	14.8	10.0	4.2	7.2	4.9	3.2	4.6	12.0	5.6	6.5	14.3	10.2	14.0
	Sales new—to—market products (% of total firms)	4.8	7.0	3.5	5.0	9.2	4.5	4.5	2.6	2.3	3.6	1.4	1.2	5.2	3.1	1.1	6.0	11.4	4.6
	Sales unchanged products (% of total innovators)	75.5	78.3	—	78.5	76.6	—	65.3	84.4	—	75.8	87.0	—	72.6	83.9	—	77.9	75.1	—
Expenditure	Firms with innovative activities expenditure (% of total firms)	29.2	22.5	—	33.5	25.6	—	24.4	17.9	—	23.3	18.0	—	54.2	41.0	—	73.5	61.6	—
	Innovative activities expenditure (% business turnover)	2.4	1.3	3.4	2.0	1.4	4.9	3.1	1.0	1.6	1.4	1.0	1.5	2.7	1.2	1.6	3.1	1.5	4.3
	Internal R&D expenditure (%)	54.8	50.8	—	43.7	43.0	—	69.4	72.8	—	69.9	49.1	—	70.6	56.6	—	29.0	48.8	—
	External R&D expenditure (%)	17.9	14.1	—	21.4	16.3	—	13.4	7.9	—	10.5	6.4	—	16.2	6.9	—	24.2	19.2	—
	Expenditure on other innovative activities (%)	27.2	35.1	—	34.9	40.7	—	17.1	19.3	—	19.5	44.5	—	13.2	36.6	—	46.9	32.0	—
Cooperation	Firms with R&D cooperation (%)	16.9	4.7	—	18.7	5.3	—	15.0	3.8	—	11.7	2.8	—	39.2	11.1	—	56.9	27.3	—
	Firms with cooperation in other innovative activities (%)	9.9	4.9	—	8.8	4.9	—	11.2	5.0	—	7.5	3.7	—	18.7	8.7	—	42.2	22.6	—
	Firms with cooperation in innovation with EU and EFTA countries (%)	7.7	2.2	—	6.9	2.0	—	8.5	2.5	—	4.8	1.2	—	18.5	5.2	—	39.2	19.0	—

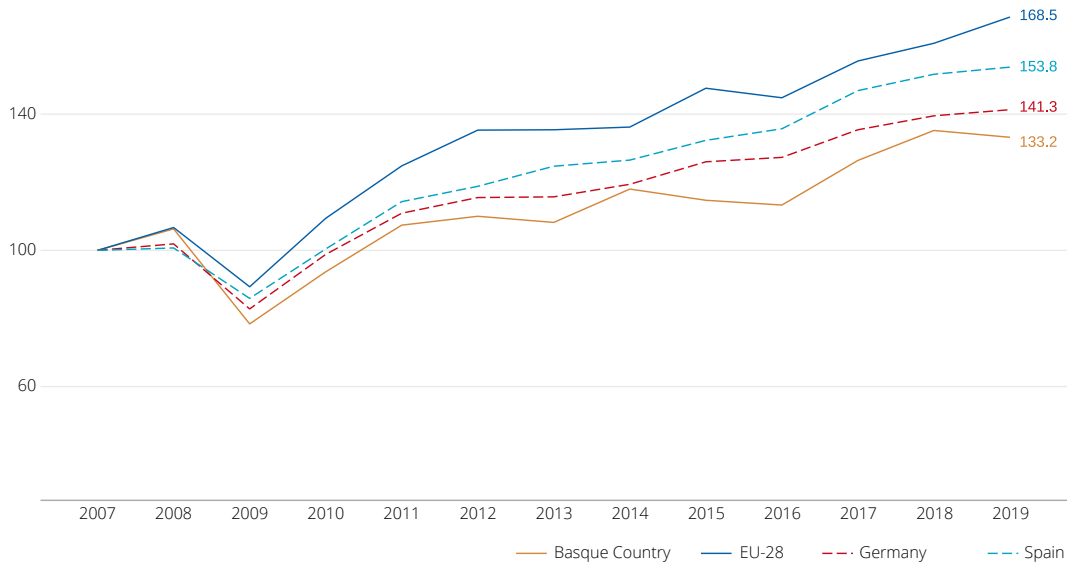
Source: Eustat, INE, ZEW.

1.3.2 Internationalization

The fall in exports in 2019 was due to energy exports

This section deals with the variation of exports and the profile of exporting firms on the one hand, and the situation regarding foreign direct investment (FDI) on the other. Thus, Graph 1.4 shows how the Basque Country maintains a trend in line with that of the rest of the territories considered throughout the period, although somewhat more irregular. In 2019, after two years with higher growth, Basque exports decreased by 1.5%, unlike the other territories, whose exports increased. This different variation is due to the weight of energy exports, which in previous years contributed to the growth of total exports and explains the decrease that occurred last year: exports from this sector decreased by almost 27% and, in contrast, those from the total non-energy sectors grew by 1.6%. Among the energy products, the decline in oil and oil derivative exports (25%) was noteworthy. This fall was partly due to falls in production due to technical stoppages for maintenance and adaptation of facilities, and a worse commercial margin environment.

GRAPH 1.4 Evolution of the value of exports of goods valued in euros (2007=100)



Source: Unctad and Eustat (Basque Statistics Office).

The exporting base of the Basque economy has increased

The profile of Basque exporters of goods is presented in Table 1.4.[8] In 2019 the export base increased by almost 7% to over 17,000 firms. This increase has a positive impact on the proportion of Basque exporting with respect to both Spanish firms and Basque firms (with employees), which increased in both cases. However, it should be noted that the number of regular exporting firms, i.e. those that have exported in the last four consecutive years, has decreased (whereas in 2018 this type of firm grew). This is also the case in Spain, but to a significantly lesser extent. Even so, in the Basque Country there is still a higher percentage of regular exporters than in Spain. In addition to whether exports are sporadic or regular, the diversity of markets reached must be considered. In this sense, the Basque Country has little pres-

[8] The time series from 2007 can be found in Appendix 5.

ence in Asia (only 8% of exports), which constitutes one of the most dynamic, future markets for the world economy.

In terms of export volumes, the absolute number of firms exporting more than €50,000 increased in 2019, but their share in the total number of exporting firms fell, as has been the case since 2010. This makes sense because, firms that start exporting can do so with low volumes. Therefore, the decrease in the value of exports observed in Graph 1.4 is reflected both in a lower proportion of Basque exports than Spanish ones, and in a lower average value of exports. A similar impact is observed at the level of regular firms, whose share in total exports decreases in the Basque Country.

As regards concentration, the trend continues: in the Basque Country the top five firms by export volume account for 26% of exports and the top one thousand for 96%, while in Spain the top five firms account for 10% and the top one thousand for 67%.

TABLE 1.4 Profile of Basque exporters compared to Spanish exporters (2018, 2019)

		2018	2019
Indicators linked to the number of exporters	No. of exporters	15,900	17,009
	% of Spanish firms	7.8	8.1
	% of total firms with paid employees	21.4	23.8
	% of firms with over €50,000 in exports	18.9	18.3
	% of Spanish firms with over €50,000 in exports	7.9	8.0
	% of regular exporters, Basque Country	31.9	30.7
	% of regular exporters, Spain	25.4	25.3
Indicators linked to export value	Value of exports, Basque Country (million €)	25,773	25,389
	% of Spain's export value	9.0	8.8
	Average value of exports per firm, Basque Country (thousand €)	1,621	1,493
	Average value of exports per firm, Spain (thousand €)	1,398	1,387
	% of exports, firms with over €50,000 in exports	99.8	99.8
	% of exports, 5 largest, Basque Country	27	26
	% of exports, 25 largest, Basque Country	46	45
	% of exports, 100 largest, Basque Country	65	64
	% of exports, 1000 largest, Basque Country	97	96
	% of exports, 5 largest, Spain	10	10
	% of exports, 25 largest, Spain	24	24
	% of exports, 100 largest, Spain	40	39
	% of exports, 1,000 largest, Spain	67	67
	% of export value, regular exporters, Basque Country	95	94
	% of export value, regular exporters, Spain	95	95

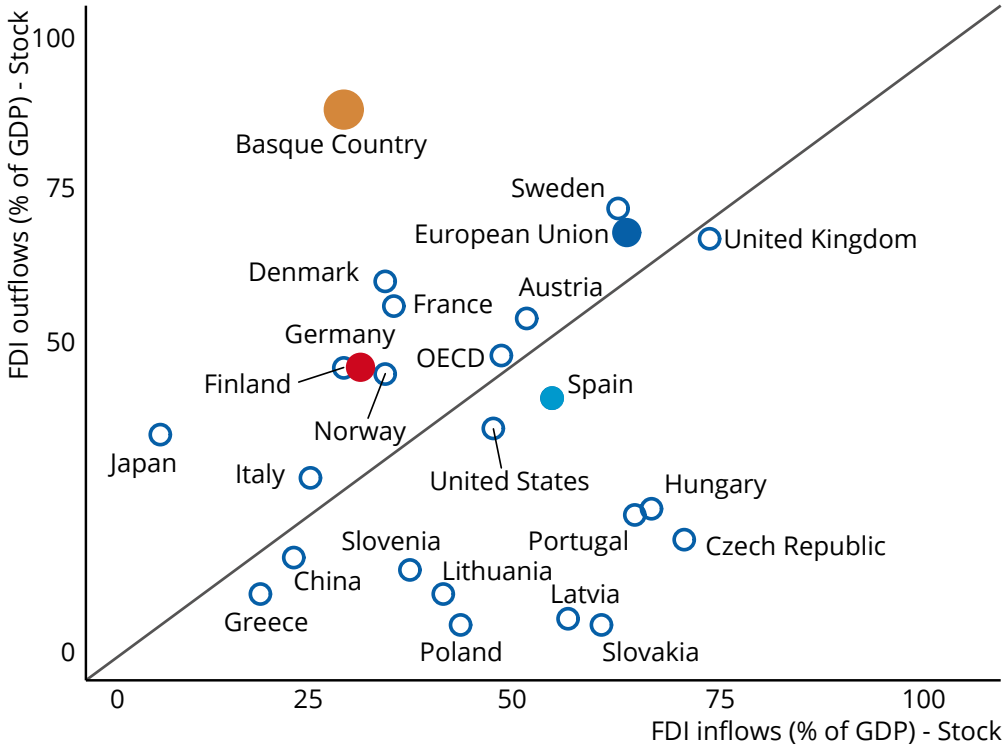
Source: ICEX (Spanish Institute for Foreign Trade) and INE (Spanish National Statistics Institute).

Moving to FDI, inflows of FDI are associated with aspects such as the attractiveness of a territory to do business, access to its knowledge and/or high-level innovation system, markets, inputs, etc. Outflows of FDI, on the other hand, are an expression of the eagerness of the territory's firms to expand, their strategies to enter international markets, the competitiveness of their offers and their capacity to manage international structures. In other words, the input indicators reflect local advantages, while the output indicators point to organizational advantages, and a distinction is also made between the stock and flow of FDI.

The Basque Country stands out for its stock of outward FDI

In relation to FDI stock, Graph 1.5 shows that, as generally happens in advanced economies, the Basque Country has much higher values in terms of outward FDI (capital of Basque investors abroad) than inward. However, this could also be interpreted as a sign of barriers of a different type (for example, the cooperative nature of much of its business fabric, which hinders its acquisition by foreign capital) or even —according to Dunning's eclectic theory, which includes the conditions which must exist for that direct investment to take place— fewer location benefits in the Basque economy to attract said capital. Whatever it may be, the Basque Country appears to be in line with such advanced economies as Germany, Japan and Korea, characterized by a high degree of specialization in manufacturing and a relatively small stock of foreign direct investment captured from abroad. On the other hand, the high values of outward stock are a reflection of investments and rollouts by Basque firms abroad.

GRAPH 1.5 Inward and outward FDI stock (% of GDP, 2019)



Source: Ministry of Economy, Industry and Competitiveness, foreign investment bulletins. UNCTAD. Eustat (Basque Statistics Office). Compiled by authors.

NB: Several OECD countries with a stock of inward and/or outward capital above 100% (Belgium, Ireland, Luxembourg, Netherlands and Switzerland) are not included in the graph).

The stock analysis is complemented analysis of the variation of FDI, although it should be borne in mind that these flows are highly volatile because they are altered by large corporate operations that are not repeated periodically. Moreover, part of the fluctuations in flows are caused by investments in the financial sector, which are more volatile than those in the productive economy. Taking into account this volatility, Table 1.5 shows that between 2013 and 2015 there were large inflows of FDI into the Basque Country, exceeding the Spanish and German ratios in almost all these years and, in many years, those of the European average. However, in the last two years, inflows have been lower than in other territories. As for the variation of FDI outflows from the Basque Country, they held up better than in the other economies until the Basque economy received the second major blow of the crisis in 2011. From there it fluctuates between very low levels and a certain recovery, which in the past two years has resulted in flows below the other territories.

TABLE 1.5 Foreign direct investment flows (% of GDP)

		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
FDI inflow (% GDP)	UE28	4.6	1.6	2.6	2.3	2.7	2.3	2.0	1.7	3.9	3.6	2.7	2.2	2.4
	Germany	2.3	0.2	0.7	1.9	1.8	0.8	0.3	–0.1	0.9	0.5	1.6	1.9	1.0
	Spain	4.4	4.7	0.7	2.8	1.9	1.9	2.1	1.7	0.7	2.6	3.0	3.2	0.9
	Basque Country	2.3	0.5	0.2	0.3	0.8	0.7	1.7	2.1	1.2	2.8	3.7	1.2	0.3
FDI outflow (% GDP)	UE28	6.8	4.0	2.5	2.8	3.0	2.0	2.1	1.5	4.2	2.7	2.9	1.8	2.5
	Germany	4.9	1.9	2.0	3.7	2.1	1.8	1.1	2.2	2.9	1.8	2.8	2.0	2.6
	Spain	9.3	4.6	0.9	2.7	2.8	–0.3	1.1	2.7	3.5	3.6	4.0	1.9	1.7
	Basque Country	42.4	7.1	2.3	3.2	8.1	0.7	2.0	1.1	0.8	4.7	2.6	1.2	1.2

Source: Ministry of Economy, Industry and Competitiveness, foreign investment bulletins. UNCTAD. Eustat (Basque Statistics Office). Compiled by authors.

Other indicators of the internationalization level of the local productive fabric relate to the shareholding interest held by local firms in foreign firms, and the interest of foreign-owned firms in local firms. In the first case, Table 1.6 shows that shareholdings in firms abroad held by both Basque firms and those from the rest of Spain have been increasing in recent years, and this figure is higher in the case of Basque firms of all sizes. Shareholdings in local firms held by foreign shareholders have also increased but are lower in the Basque case than in Spain. This means that the percentage of Basque firms with shareholdings abroad is greater than those which are affiliates, with the opposite being true for Spanish firms of every size since 2017.

TABLE 1.6 Firms with foreign shareholders

% companies active with partners abroad

		Range of employment			
		<50	50 y 249	>249	Total
Rest of Spain	2008	0.4	9.1	30.4	0.7
	2011	0.5	11.7	32.8	0.9
	2013	0.6	12.9	29.7	1.0
	2017	0.9	14.7	32.4	1.3
	2019	1.0	14.0	32.2	1.4
Basque Country	2008	0.7	16.0	34.7	1.5
	2011	0.9	19.7	37.2	1.7
	2013	0.9	19.1	35.1	1.7
	2017	1.2	22.1	38.5	1.9
	2019	1.3	19.2	39.5	2.0

% active companies with foreign shareholders

		Range of employment			
		<50	50 y 249	>249	Total
Rest of Spain	2008	0.7	8.7	24.7	1.0
	2011	0.8	10.3	24.6	1.1
	2013	1.0	12.4	25.3	1.3
	2017	1.4	15.6	31.9	1.8
	2019	1.5	15.3	32.2	2.0
Basque Country	2008	0.7	10.5	18.6	1.2
	2011	0.7	10.3	15.2	1.1
	2013	0.9	10.5	17.6	1.3
	2017	1.2	15.0	23.1	1.7
	2019	1.2	14.9	24.7	1.8

Source: SABI-Informa. Compiled by authors.

In summary, the Basque economy closed 2019 with a certain decline in exports (caused by the fall in energy exports), which placed the ratio of exports to GDP below even the value of Spain. Even so, the percentage of exporting firms continued to grow, albeit with a slight fall for regular exporters and a higher proportion for those with a low export volume. Although outward and inward FDI flows have declined in the last two years, it is an economy with a high stock of investment abroad. The percentage is very similar between firms with foreign shareholdings (2%) and foreign shareholders (1.8%). However, this depends on the employment bracket, as in medium and large firms the percentage of firms with foreign holdings is significantly higher than that of those with foreign shareholders.

1.3.3 Firm finance

The expectations of firms with regards access to finance have deteriorated

One of the first economic measures taken in response to the pandemic was the provision of cash flow to the system, which has made it possible to avoid a cash flow shock as happened in 2008 and to give firms peace of mind in the short term. Although the European Central Bank has announced that it will maintain a policy to ensure cash flow in the economy,[9] the perception of firms is negative, as for the first time since 2014 the expectations that firms have about access to financing have deteriorated.[10] In view of this scenario, it is necessary to know the starting situation of the balance sheets and profit and loss accounts of Basque firms, given that the ability to obtain financing will determine their capacity to resist and make necessary decisions for recovery. The situation in the Basque Country is compared with that of Spain, based on the Sabi database; and indirectly with the EU10 (hereinafter in this section, Europe), by comparing the Spanish and European situations according to the BACH database.

[9] https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.mp200910~f4a8da495e.en.html

[10] Survey on the access to finance of enterprises (SAFE). October 2019 to March 2020. European Commission. May 2020.

Table 1.7 shows the variation in different indicators related to the percentage share of the main balance sheet items, income statement items and profitability and indebtedness indicators. The situation of the Basque Country balance sheet shows a greater weight of own resources than in Spain (45.6% compared to 43.6%), and a greater use of trade financing (21.4% compared to 19.2%). The Basque Country, like Spain, has increased the weight of equity on the balance sheet, especially in the period comprising 2008 to 2013 (8.7 percentage points), and reduced financial debt (financial debt has been reduced by 8.1 percentage points); in comparison with Europe, in Spain the increase in the weight of equity and the decrease in the weight of financial debt have been very noticeable. It can be concluded that the weight of equity is greater, and that that of financial debt is considerably lower in the Basque Country than in Europe. On the other hand, firms in the Basque Country stand out from Spanish firms because they have a greater weight of debt related to working capital, especially those of a smaller size. SMEs perceptions[11] suggest that this will be compromised in the coming months.

The profit and loss account shows a situation of convergence between the Basque Country and Spain and a more favorable variation than that of Europe in recent years. In this way, although the variation in the Basque Country has been positive in comparison with Europe, this is not so when compared with Spain, which has surpassed pre-crisis levels in 2008.

The profitability of Basque companies depends on their normal operating activity

Consistent with the above, the Return on Assets (ROA) of Basque firms has recovered in recent years (2.2% in 2013 compared to 3.8% in 2018); but this improvement is not sufficient to reach pre-crisis levels of profitability (4.2% in 2008), which is also the case in Spain because the ROA in Spain in 2008 was lower than in the Basque Country (2.8% in 2008 compared to 3.5% in 2018). The positive variation of the Basque Country is based on the profitability of operations (operational ROA) and has been hampered by the poor variation of financial profitability, financial ROA (which has risen from 5.7% in 2008 to 2.8% in 2018). From the difference between the operational and financial ROA, it can be deduced that the bases of profitability of Basque firms are not to be found in their financial investments, but in their normal operating activity, an activity which to a large extent takes place in the territory itself.

In terms of Shareholder Return (ROE), the data indicates a significant recovery (1.8% in 2013 versus 6.7% in 2018). By comparison, Spanish firms have performed considerably better (1.1% in 2013 compared to 7.0% in 2018) and have outperformed firms in the Basque Country and Europe, especially in the recovery, from 2013 onwards.

Finally, when analyzing the variation of debt indicators, in the Basque Country there is greater debt coverage (24.5% in 2013 compared with 14.4% in 2018) and greater capacity to pay expenditure (0.7 in 2013 compared with 0.2 in 2018). The situation in the Basque Country is similar to that of Spain, which has improved significantly in both debt indicators compared to Europe, especially since 2013.

It can therefore be concluded that, compared to the crisis of 2008, Basque firms are starting out with more solid balance sheets, that they have undergone a cer-

[11] Survey on the access to finance of enterprises (SAFE). October 2019 to March 2020. European Commission. May 2020.

Basque companies have entered the current crisis with more solid balance sheets than in 2008

tain process of convergence with the Spanish situation, and that their variation has been more positive than that of Europe. As their main strength, Basque firms have a higher level of capitalization, but —especially for those of smaller size— they make greater use of working capital financing, which is a type of financing more susceptible to be reduced in periods of crisis. Given the great uncertainty of the moment, and the lack of knowledge with regard to the depth and duration of the crisis, firms have reacted in the first months by increasing their debt in order to build up cash flow reserves.

TABLE 1.7 Main indicators of economic and financial position

		Basque Country (a)			Spain (a)			Spain (b) *vs.* UE10 (b)		
		2008	2013	2018	2008	2013	2018	2008	2013	2018
Balance sheet	Equity	36.5	45.2	45.6	30.6	37.9	43.6	+	+ +	+ +
	Financial debt	39.4	34.0	31.3	46.4	42.4	35.0	+ +	+	–
	Commercial debt	21.9	18.9	21.4	20.9	17.4	19.2	–	–	–
Profit and loss	EBIT	5.2	2.8	4.1	3.7	2.2	3.8	=	–	+
	Financing costs	3.8	2.7	1.2	4.3	3.4	1.3	=	=	=
	Net income	3.2	1.0	3.3	1.2	0.6	3.3	=	=	+
Profitability	Total ROA	4.2	2.2	3.8	2.8	1.6	3.5	–	–	=
	Operating ROA	6.0	3.5	5.8	3.9	2.6	5.4	–	–	+
	Return on financial assets	5.7	2.5	2.8	6.3	4.0	3.8	–	=	=
	ROE	7.0	1.8	6.7	2.9	1.1	7.0	–	–	=
Indebtedness	Debt / EBIT	15.3	24.5	14.4	24.7	38.0	16.3	+	+ +	– –
	Fin. costs / (EBIT+FinInc)	0.5	0.7	0.2	0.7	0.8	0.2	=	=	=
	Cost of debt	4.8	3.3	2.1	4.6	3.4	2.1	–	+	–

Source: (a) SABI-Informa (b) Bank for the Accounts of Companies Harmonised (BACH).

NB: (b) Comparison of the level (numerically higher (+), similar (=), or lower (-)) of Spain in each ratio with the EU-10, which includes data for Belgium, the Czech Republic, Austria, France, Germany, Italy, Poland, Slovakia, and Portugal. For the EU-10 calculation, the individual results of each country have been weighted according to the size of its economy.

1.3.4 Labor costs and productivity

Labor costs continue to be a key determining factor of economic competitiveness due to their potential impact on general price index (inflation) and on foreign trade. The labor cost incorporated into each product unit (ULC) is determined by two factors: the labor cost per employee (LCE) and productivity. The more productive the worker is, the cost will be spread over a larger number of units and the cost that will have been incorporated into each unit will be lower. This section focuses on analyzing the comparative situation of these main figures in 2019 for the economy as a whole and the manufacturing sector. Appendix 6 contains graphs showing their variation.

In Table 1.8 we can see two noteworthy characteristics: the high correlation between LCE and productivity, and the differences in ULC between the economy as a whole and the manufacturing industry. The first characteristic is explained by the fact that high productivity makes it possible to pay high wages, which in turn drives the search for greater innovation and the replacement of workers by capital. Thus, the column showing the level of LCE reflects the differences in welfare between territories, as the order of these is as follows: Germany, Basque Country, EU-28, and Spain.

The level of labour cost per employee reflects welfare differences between territories

The productivity of the Basque Country in the whole economy is similar to Germany, which together with a lower LCE result in a ULC that is lower than both Germany and the European average, and somewhat higher than Spain. In the manufacturing sector, however, higher productivity does not compensate for the wage gap with the EU-28 average, resulting in a ULC that is above average, but still below that of Germany.

TABLE 1.8 Labor cost per employee (LCE), Productivity and Unit Labor Costs (ULCs) (2019)

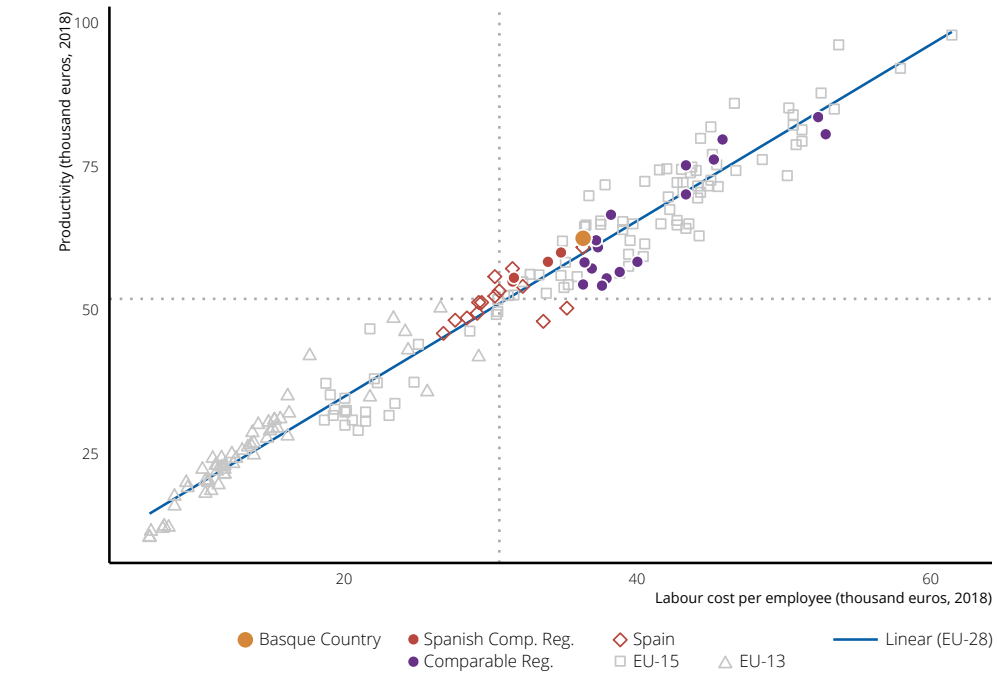
	Total economy			Manufacturing industry		
	Labour cost per employee (thousands €)	**Productivity per employee (thousands €)**	**Unit labour cost (%)**	**Labour cost per employee (thousands €)**	**Productivity per employee (thousands €)**	**Unit labour cost (%)**
UE28	38.2	60.8	62.8	41.7	69.6	60.0
Spain	32.7	55.8	58.5	37.5	68.4	54.9
Germany	45.0	68.4	65.8	58.1	85.9	67.6
Basque Country	41.1	67.9	60.5	46.2	73.9	62.6

Source: Eustat (Basque Statistics Office) and Eurostat. Compiled by authors.

The comparative situation of LCE and productivity among European regions is analyzed below. In addition to confirming the high correlation between LCE and productivity in European regions (σ = 0.9392), Graph 1.6 shows that, for the economy as a whole, the Basque Country is positioned in the upper right quadrant (therefore, with a higher level than the average of the sample) on the adjustment line, above the Spanish regions (both comparable and not), and with an average level with respect to the comparable regions in the rest of Europe. In the manufacturing sector (in Graph 1.7) there is a greater regional dispersion. In the case of the Basque Country, it is also positioned in the upper right-hand quadrant. Most comparable foreign regions have higher labor costs per employee, and only in a few cases are their higher productivity levels sufficient to compensate for these higher costs, so their ULC is higher, suggesting that there is a comparative advantage with most of these regions that have a similar structure.

The unit labour costs of Basque manufacturers are higher than the European average, but lower than those of comparable regions

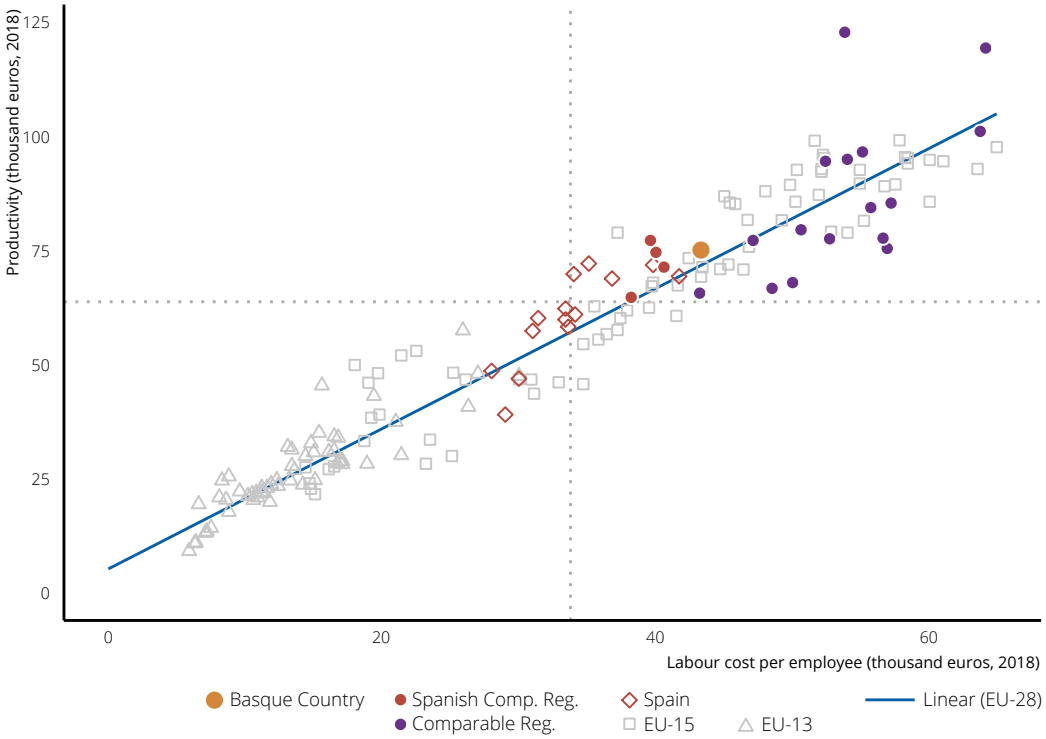
GRAPH 1.6 Labor cost per employee, and productivity (GVA per employee) for the economy of the EU-28 regions as a whole (2018 or closest year)



Source: Eurostat. Compiled by authors.

NB: There are three regions which are not included in this graph, as their productivity is above 100.

GRAPH 1.7 Labor cost per employee, and productivity (GVA per employee) for the manufacturing industry in the EU-28 regions (2018 or closest year)



Source: Eurostat. Compiled by authors.

NB: There are three regions which are not included in this graph, as their productivity is above 150.

1.4 Starting point for digital and energy transitions

The pandemic has highlighted the need to reinforce two transitions that were already part of the political agenda and business reality: digital and energy. Thus, in this section, through the data available, we analyse the position of the Basque Country to face these transitions.

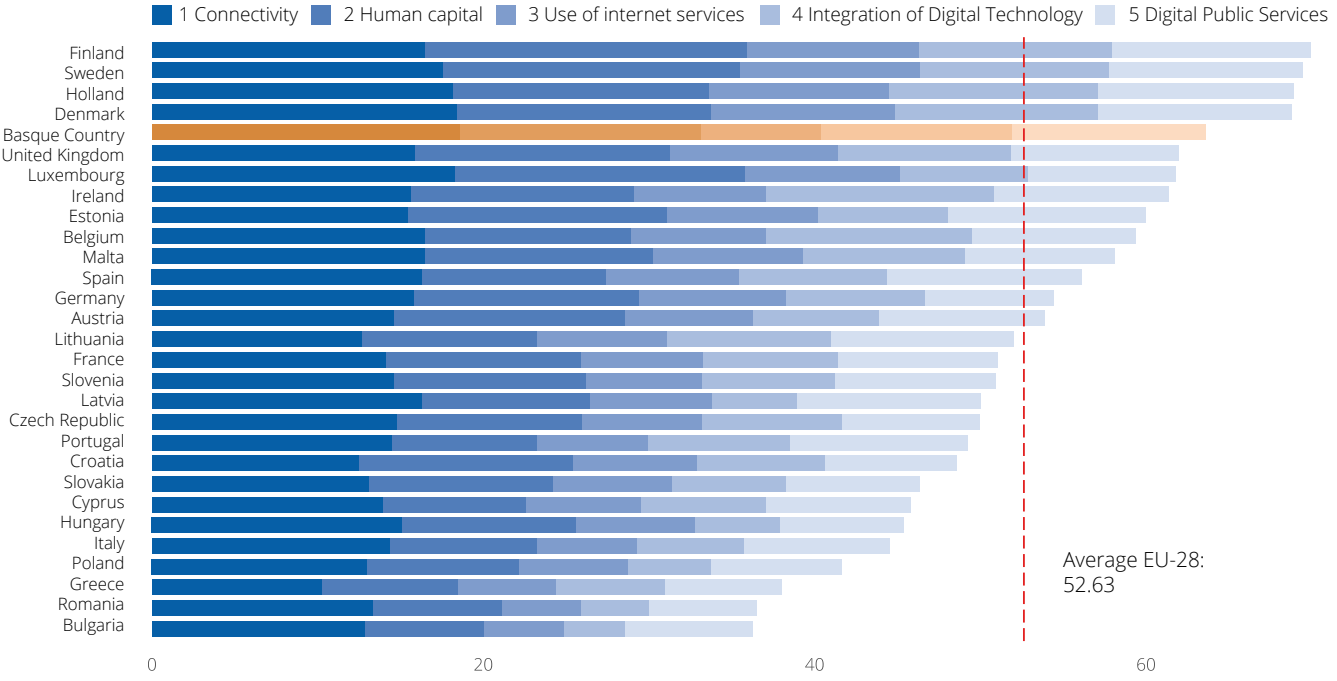
The pandemic has manifested the need to strengthen the digtal and energy transitions

1.4.1 Digital transition

Analysis of the digital transition is based on the results of the DESI (Digital Economy and Society Index) that Orkestra has been calculating for three years.[12] As shown in Graph 1.8, with a value of 63.61%, the Basque Country would be in fifth position in relation to the EU-28 states (well above the average, which stands at 52.49%), consolidating the place of the last three years. Broken down by dimensions, the Basque Country is above the European average in four (connectivity, technology integration in firms, digital public services and human capital), and only in terms of the use of Internet services in the home (as observed in the first section of this chapter) does it fail to reach this average.

The Basque Country is situated in fifth position in the DESI index

GRAPH 1.8 2019 DESI Index



Source: Prepared by Orkestra on the basis of Eurostat, INE, Eustat, CNMC.

Another positive note is that the Basque Country continues to advance or holds its place for 35 of the 47 indicators. During the last financial year, the increases were over 5%, and there was only a slight cut in the human capital dimension (0.17% less than the previous year). The good connectivity conditions, due to the work of fast and ultra-fast broadband implementation, are coupled by the integration of digital technology in firms, with values much higher than the European average (57.68

[12] The full DESI 2019 report is available at: https://www.orkestra.deusto.es/euskadi-economia-digital/2019/

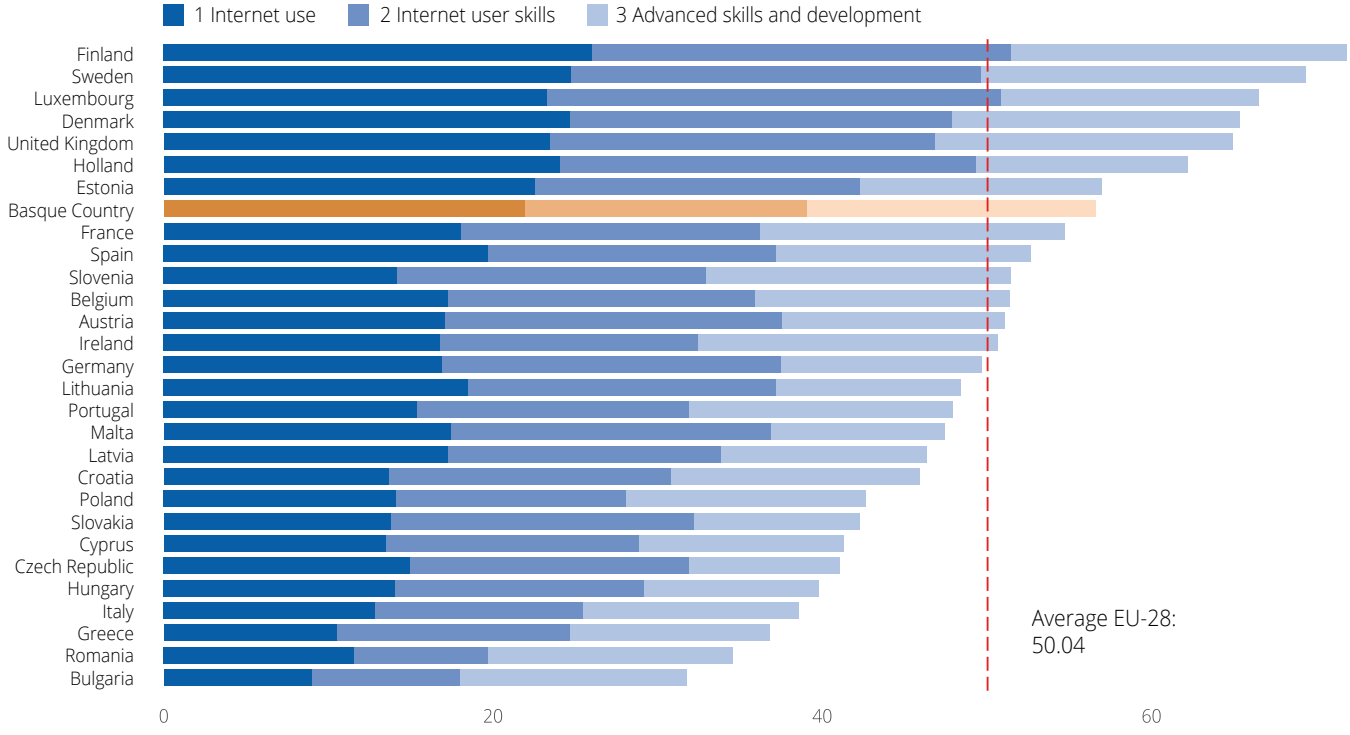
and 41.05% respectively). However, this does not translate into commercial results, through further exploration of new business models. In digital public services, the efforts made by the public administration have achieved good results, but this supply has to be translated into higher levels of demand by citizens, a pattern that is reproduced in the home for the use of Internet-based services, especially those that require economic transactions. Finally, in terms of human capital, digital skills and specifically software skills need to be further developed at user level and the number of ICT specialists increased, as it is below the European average.

The temporal analysis described in the DESI report also reveals that there have been improvements in performance in all dimensions and in most of the indicators that support them. The Basque Country has already been implementing initiatives to favor the digital transformation in various fields, such as the Basque Digital Innovation Hub (BDIH), through which Basque SMEs can access the technological and R&D infrastructure offer of technology centers, universities and business R&D centers, and which serves to facilitate the testing and validation of digital and sustainable solutions. However, the improvements observed in the DESI have not translated into progress in the relative position with respect to other countries, which suggests that digitization is on the agenda of all countries.

A more feminine digitalization would strengthen the digital transition

With regard to the role of women in the Basque Country's digitalization process, the WiD (Women in Digital) index, which is also included in this year's DESI report, shows that their contribution is moderate, occupying an eighth position (see Graph 1.9). This participation is unevenly supported by the use of the Internet and advanced digital skills for the labor market, while the basic skills for women to be able to perform at their full capacity as Internet users presents room for improvement.

GRAPH 1.9 2019 WiD Index



Source: Prepared by Orkestra from Eurozstat, INE, Eustat, CNMC.

Therefore, "more feminine" digitalization will strengthen and make the digital transition sustainable. Also, a more balanced progress between the dimensions of the WiD will contribute to a more advanced and equal digitalization, reducing risks of future digitalization fractures. Indeed, the share of women in the digital sector is even lower than it is among university students in STEM areas, so it would be advisable to maintain and strengthen policies to promote these vocations. Digital competences should also be further strengthened to overcome gender barriers in the territory and thus converge with European leaders.

1.4.2 Energy transition

The fall in energy intensity is a key recent achievement of the Basque economy

The Basque Country faces this decade in the midst of a process of transformation of its energy system that began in the 1980s. The main achievements to date include the fall in the energy intensity of the Basque economy and a gradual reduction in the weight of fossil fuels in the energy matrix.[13] In order to understand the situation in comparison with the EU-28 countries, an exploratory analysis of an energy transition indicator has been carried out, adapting the Energy Transition Index (ETI) prepared by the World Economic Forum (2020) to the Basque Country's energy system.

The ETI is a synthetic indicator that includes thirty-eight variables grouped into two sub-indices: "System Performance" and "Transition Readiness." Due to the limited availability of information on some indicators included in the sub-index "Transition Readiness," only the sub-index "System Performance" has been reproduced, which allows for a comparison of the current situation of the different energy systems and not their transformation capacity, as reflected in the other sub-index. In turn, this "System Performance" sub-index includes three groups of variables: "Economic growth and development," "Environmental sustainability" and "Access to energy and energy security."[14]

As can be seen in Graph 1.10, the Basque Country presents a result lower than the average of the EU-28 countries, standing at 20 out of 29. This is mainly due to the group of variables "Economic growth and development," where the prices of electricity and natural gas in Spain as a whole have a negative impact,[15] and to the weight of net energy imports within the GDP of the Basque Country (as shown in Graph 1.11).[16]

[13] Source: Eustat (https://www.eustat.eus/elementos/tbl0006211_c.html) and Energy Strategy for the Basque Country 2030 (https://www.euskadi.eus/contenidos/informacion/estrategia_energetica_euskadi/es_def/adjuntos/3E2030_Estrategia_Energetica_Euskadi_v3.0.pdf).

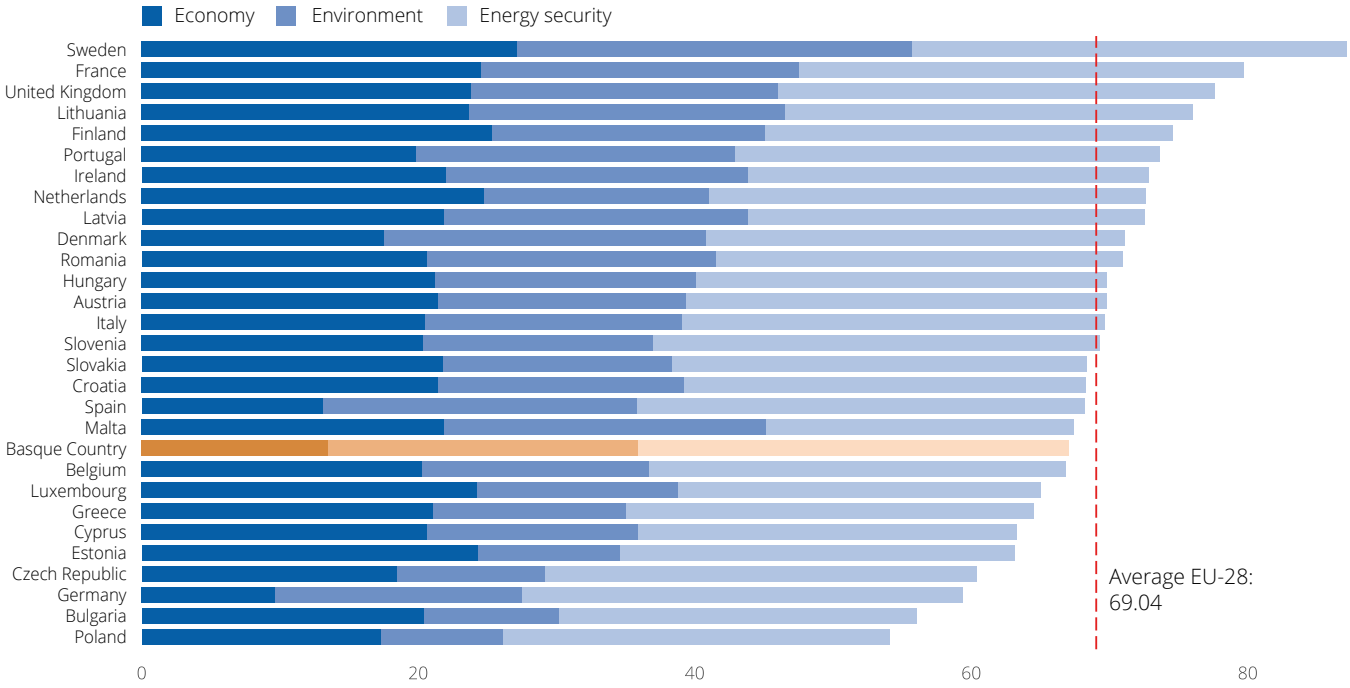
[14] Appendix 7 describes its composition and the methodological decisions for its elaboration in the Basque Country.

[15] As with the other values, the original source from the World Economic Forum has been maintained, in this case Enerdata (price of electricity for the domestic consumer), the World Bank (price of electricity for the industrial consumer), and the International Gas Union (price of natural gas on the wholesale market). Eurostat gives a somewhat better position for Spain within Europe regarding the price of electricity for domestic and industrial consumers, and also for the industrial price of natural gas (although it does not give wholesale market prices). One of the reasons for the relatively high energy prices in Spain compared to other countries in Europe is the weight in energy bills (especially electricity) of costs not directly related to energy supply (taxes and other sources of costs linked to state environmental, social or territorial policies), which reach almost 50% of the total cost.

[16] The energy export indicator is higher the higher the weight of these exports in the GDP, while the energy import indicator is higher the lower the imports. As the Basque Country does not have significant equity, having a good position in the first indicator means having a bad position in the second. In this respect, the case of the Basque Country is similar to that of the Netherlands. Nevertheless, certain activities, such as refining, produce net exports of oil products.

The high CO_2 equivalent emissions derived from the primary energy consumption of the Basque economy also have a negative impact on the relative position of the Basque Country[17]. This is consistent with the degree of industrialization in the Basque Country and, especially, with the weight of energy and emission-intensive industry. In the category "Energy access and security", however, the Basque Country is above the EU-28 average on most indicators.

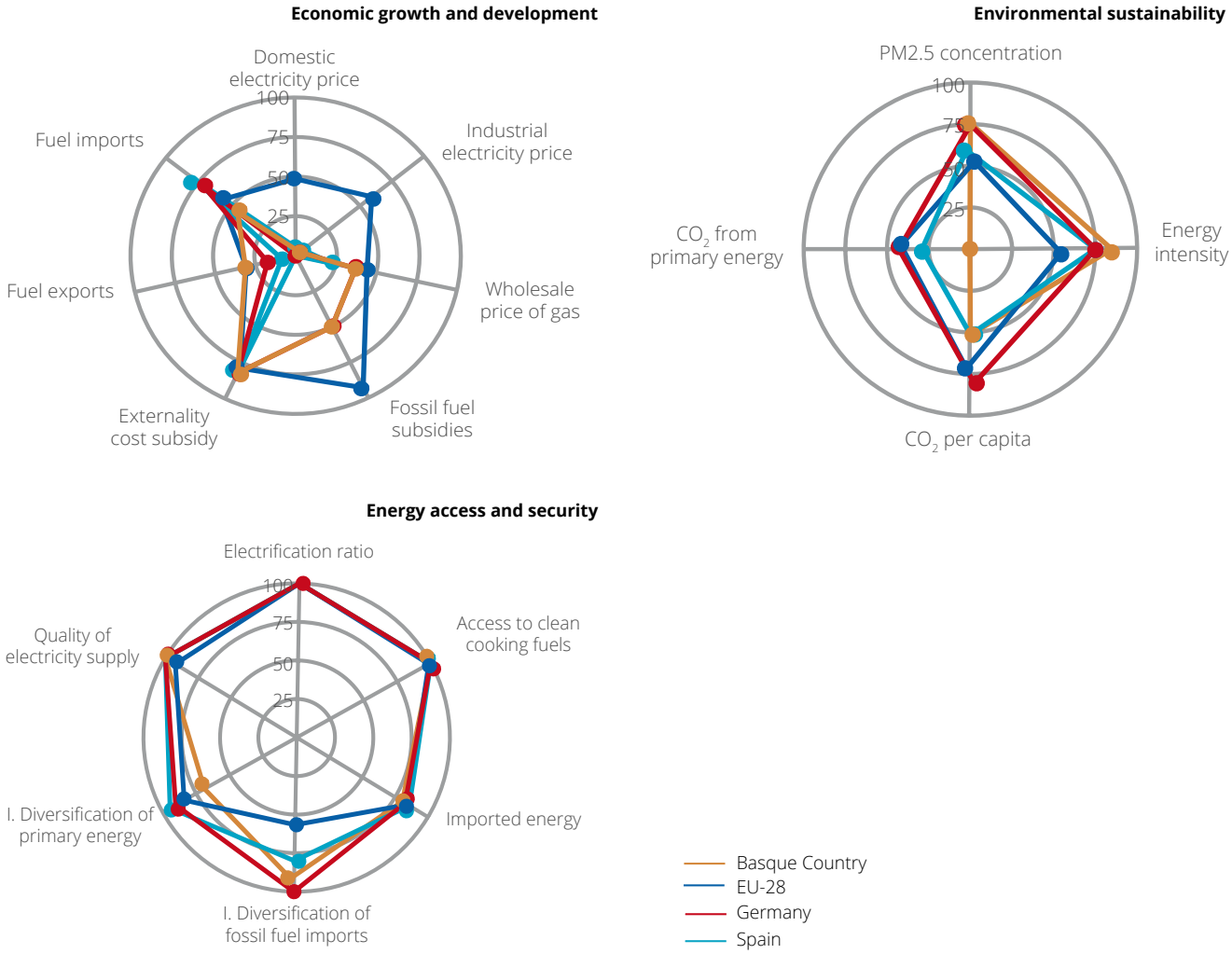
GRAPH 1.10 System Performance Indicator



Source: Compiled by authors based on Eustat, EVE, the Basque Government, Investing.com, and the World Economic Forum.

[17] Emissions from the energy sector, as established by the IPCCC (2006), refer to those derived from the combustion of fossil fuels within equipment to generate heat or mechanical power to a process or for use outside the equipment. This includes electricity and heat generation, transport and energy uses in sectors such as industry, residential, and commercial.

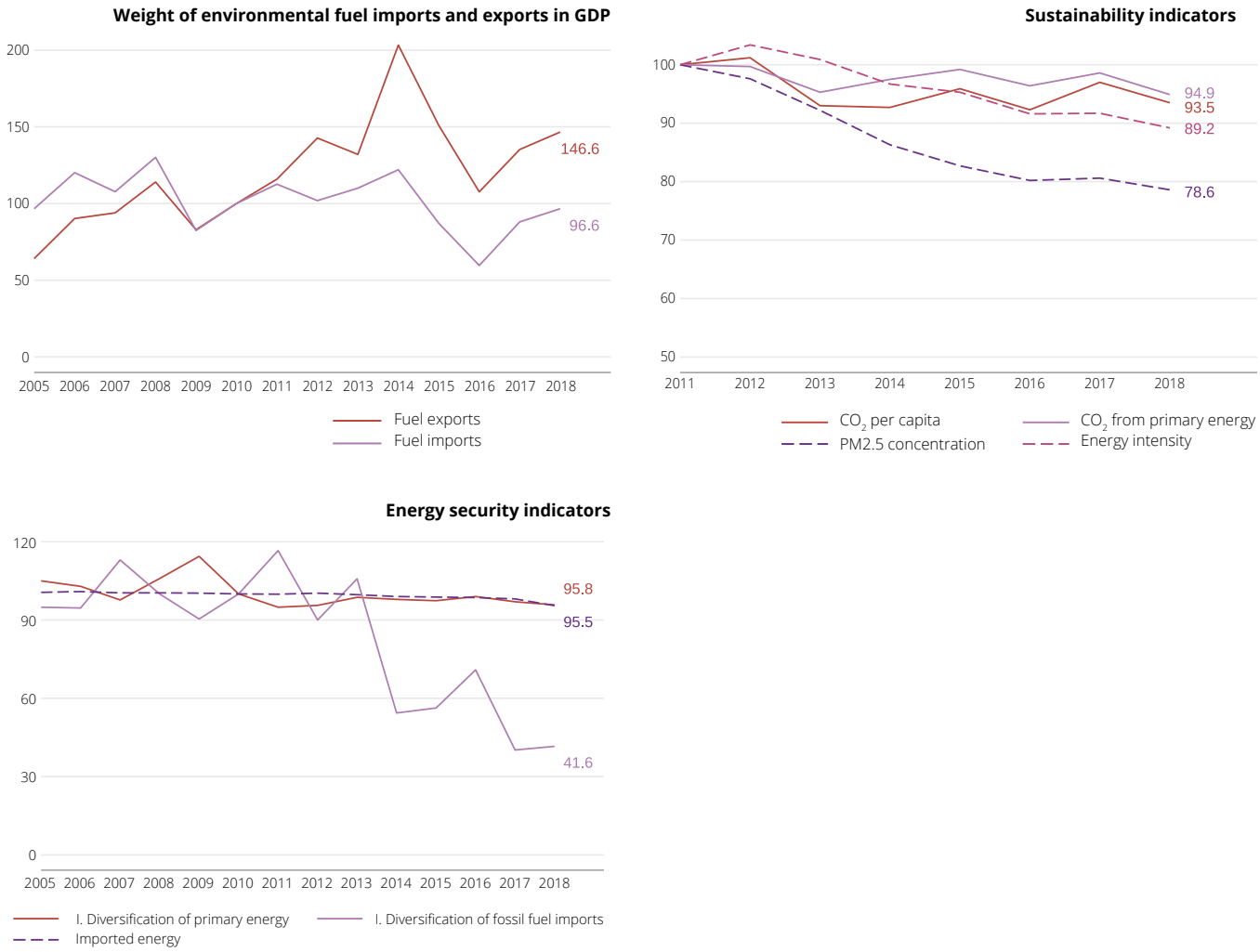
GRAPH 1.11 Normalized value of the System Performance Indicators



Source: Compiled by authors based on Eustat, EVE and World Economic Forum.

To provide a temporal context to the results obtained, Graph 1.12 shows the variation for the Basque Country of the indicators used in the "System Performance" subindex for which information is available. The data show that the Basque Country has progressed in all of them, although not to the same degree. Those categories in which the Basque Country has evolved most with respect to the situation in 2010 include the concentration of polluting particles and the diversification of fuel imports. In contrast, less progress has been made in terms of CO_2 emissions per capita and per unit of primary energy.

GRAPH 1.12 Evolution of some of the System Performance indicators in the Basque Country



Source: Compiled by authors based on Eustat, EVE, the Basque Government, and Investing.com

NB: The I. Diversification of fossil fuel imports and the I. Diversification of primary energy are estimated by the Herfindahl and Hirschman Index (HHI). For its interpretation, the lower the index, the greater the diversification.

The results obtained from this experimental analysis should be evaluated with caution. On the one hand, the vision on the energy transition in the Basque Country that is generated by taking into account only the "System Performance" sub-index is incomplete. This indicator focuses on the current situation of the energy system in the Basque Country, which responds to the needs of the structure of the Basque economy, with a strong weight of energy-intensive industry, due to the high domestic and industrial price of electricity and to the difficulty of significantly increasing the weight of renewable energies in the energy matrix, especially in key sectors such as industry, transport and construction.

On the other hand, in many categories of the sub-index "Transition Readiness", not assessed in this Report due to the lack of data available to construct it, the Basque Country presents strengths which, if taken into account in a more complete analysis, may change the orientation of the conclusions.

For example, the Basque Country has a business fabric in the area of energy made up of more than 350 firms, with a global turnover of €54.7 billion and more than 23,900 jobs in the territory, as well as a research, technology and innovation system which generates activity worth €242 million and supports almost 2,500 people in R&D&I in the Basque Country. Moreover, the Basque energy sector accounts for 5.5% of turnover, 2.5% of employment and 17.8% of R&D expenditure in the Basque economy. It is also well positioned with respect to the rest of Spain (13.6% of the GVA of the electrical material and equipment sector, and 15% of total employment in the sector in Spain).

Among the firms that make up the fabric of the energy sector are leading firms, of international reference and with a great driving role, especially in areas such as renewable energies and electricity networks, which have developed strategies that will involve significant investment volumes over the next ten years in the area of energy transition. The prospects of return on all these investments are very favorable in comparison with other areas of activity, both in terms of the employment generated (35 jobs per million euros invested) and the GVA created (€9.8 million per million euros of R&D&I subsidy).

In short, the Basque economy has the necessary elements to face the new challenges derived from the energy transition and to benefit from the positive impact, both environmental and social and economic, that the investments and the transformation to be carried out in the energy field will have.

The Basque economy has the necessary tools to face the energy transition

The analysis illustrates the path traveled by the Basque Country in the field of energy, with a positive variation of environmental sustainability indicators in recent decades, and identifies the main challenges that will be faced in the coming years in order to make the transition to a more sustainable economy by simultaneously strengthening the sources of business and territorial competitiveness. These can be summarized in: (1) reducing greenhouse gas emissions in key sectors such as transport and buildings; (2) reducing energy intensity and consumption of fossil fuels in the industrial sector; and (3) increasing the diversification of primary energy sources, with a greater presence of renewable energies.

2
Resisting the pandemic: Impacts and vulnerability

The first 'state of alarm' in Spain to combat the health emergency, which lasted from March to the end of June 2020, put society "on pause" and implied a shock for much of its economic activity.[18] This period led to unprecedented drops in economic and social activity, although since mid-April this activity has been progressively reactivated with the phases to end lockdown and the transition to a new situation, full of uncertainty, which implies "living with the virus".

This chapter discusses the impacts of the pandemic in the short term.[19] Initially, a summary of the main economic impacts is made, from which the asymmetric effects in different sectors are analyzed and the sectoral vulnerability in the Basque Country is characterized. Understanding the multiple factors that determine impacts and response capacities in different sectors is particularly important to design and implement policies that are adapted to different situations and sensitive to trade-offs.

2.1 Short-term impacts of the pandemic

The fall in GDP and rise in unemployment have been more pronounced in Spain and the Basque Country

The evolution of competitiveness indicators during 2020 highlights the scale of the socio-economic impact of the pandemic, and therefore the challenges of reconstruction and renewal going forward. Graphs 2.1 and 2.2 show the variation of GDP and the employment rate in the Basque Country over the last year, comparing them with Spain, Germany, Austria, and the European average.[20] Although all countries show a similar trend, reflecting the universal impact of the pandemic, both the fall in GDP and the rise in unemployment have been more pronounced in Spain and in the Basque Country, reflecting elements such as the severity of the health crisis here, the

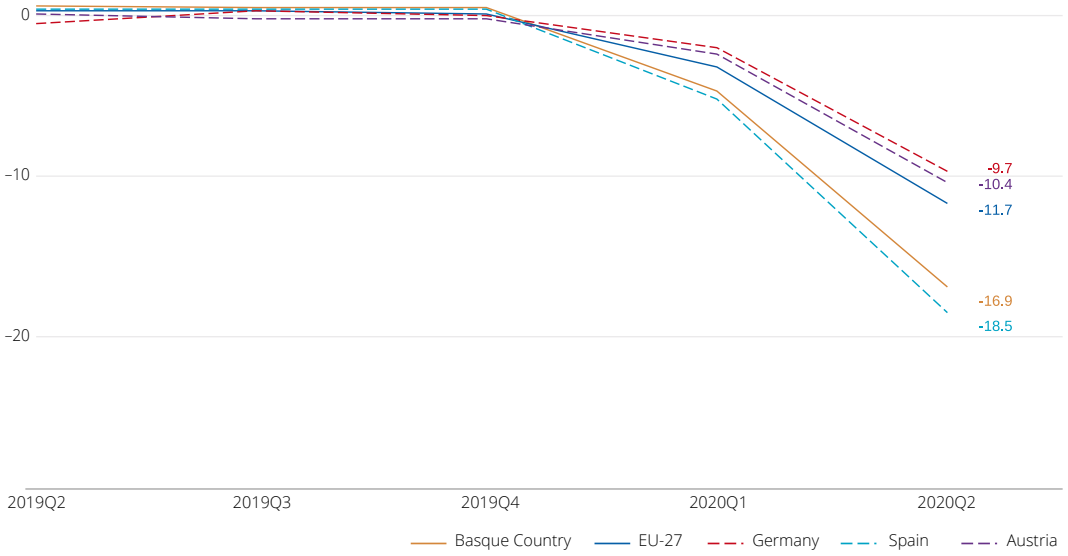
[18] Royal Decree 463/2020 of March 14 and Royal Decree 10/2020 of March 29 established limitations on the mobility of persons (and consequently on their work activity), suspension of educational and training activities, measures of containment in the fields of commercial activity, cultural facilities, recreational establishments and activities, hotel and restaurant activities, limitations on transport, and measures to guarantee access to essential goods and services such as food, energy or telecommunications, among others.

[19] The analysis in this chapter is largely based on the background article by Retegi *et al*. (2020), where more detail on several of the elements discussed can be found.

[20] Germany and Austria are included because Chapter 3 analyzes the policy responses in Baden-Württemberg (Germany) and Upper Austria (Austria) due to their structural characteristics similar to the Basque Country.

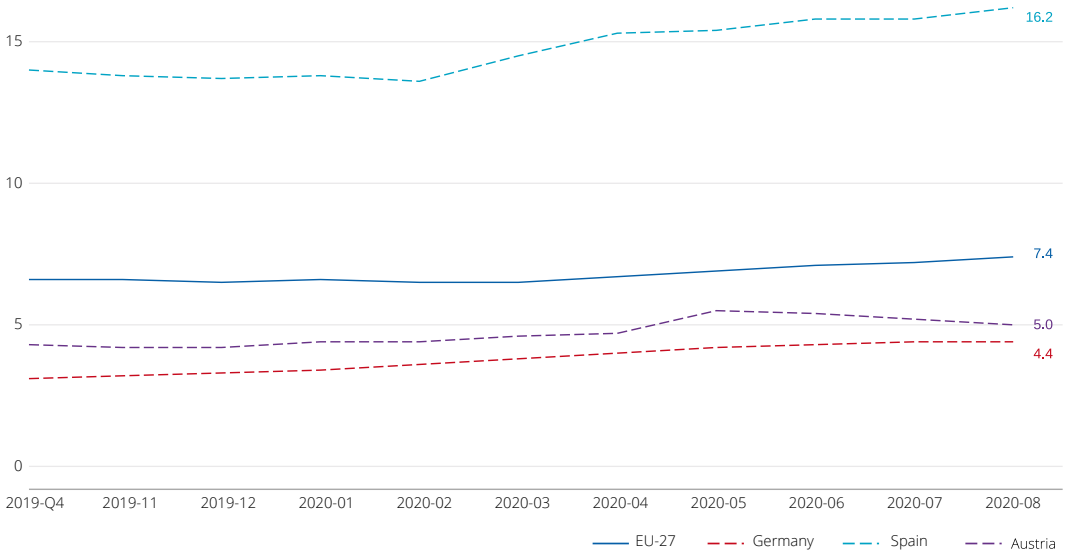
measures employed to control it, and the structure of the economy itself (for example, the importance of tourism in Spain). It is important to note that the increases in unemployment rates in all the countries analyzed have been softened so far due to measures, such as the Temporary Redundancy Plans (ERTEs), put in place to prevent labor disengagement. The Basque Country has followed the same European trend and it is also observed that female employment has suffered the least during the resistance phase, probably due to its concentration in essential services (Graph 2.3).

GRAPH 2.1 Year-on-year rate of change in GDP (%)



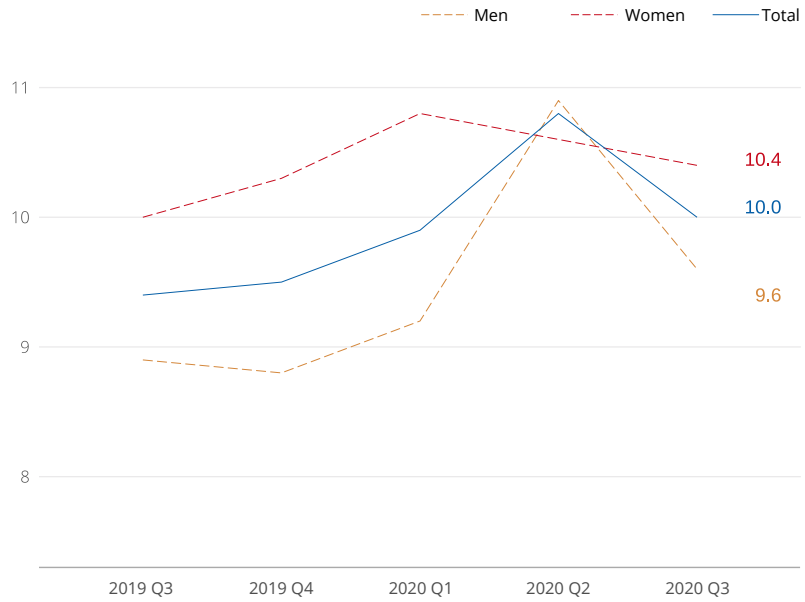
Source: Compiled by authors based on Eurostat and Eustat.

GRAPH 2.2 Unemployment rate (% active population)



Source: Compiled by authors based on Eurostat.

GRAPH 2.3 Unemployment rate Basque Country (% active population)

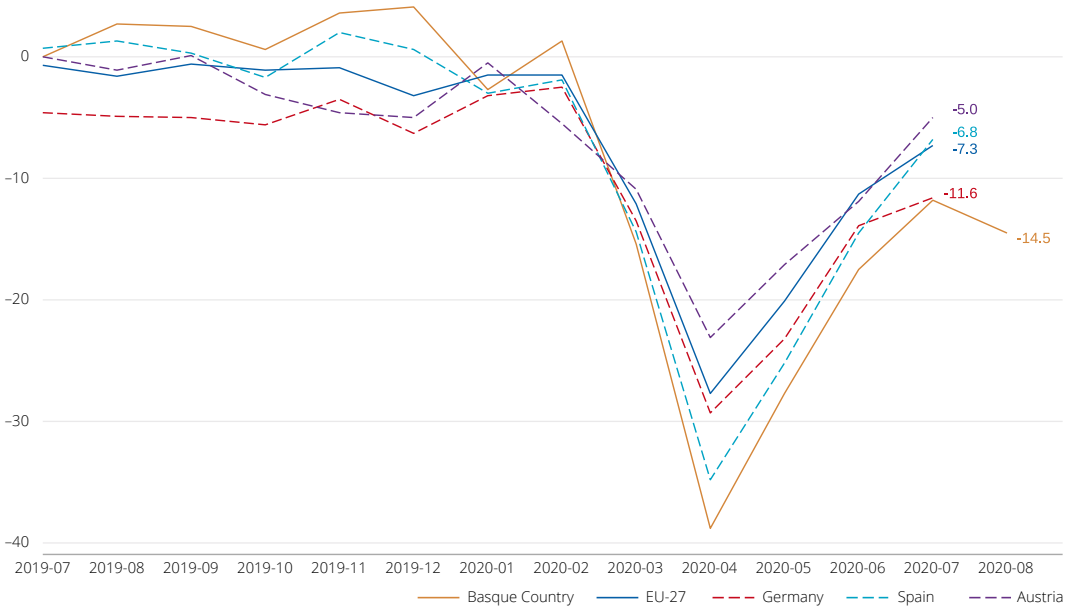


Source: Compiled by authors based on Eustat

The recovery in industrial production has been rapid

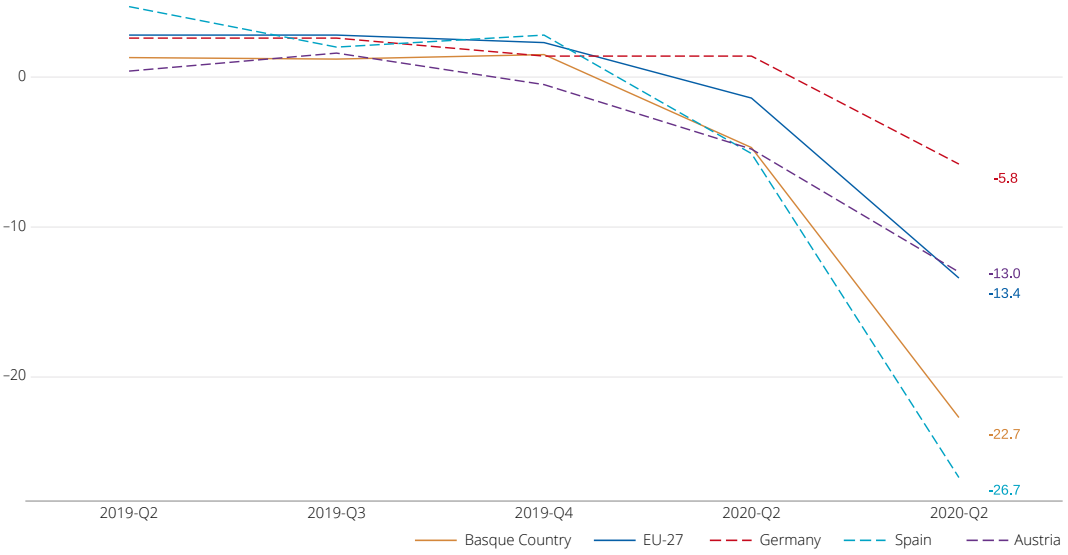
The variation of these performance indicators is rooted in the collapse of production and consumption of goods and services caused by the health crisis. Restrictions on mobility and non-essential economic activities have had effects on industrial activity in the Basque Country that are reflected in the Industrial Production Index (IPI) (Graph 2.4). The fact that the fall has been more severe in the Basque Country compared to Spain reflects its greater industrial specialization, and the fact that the fall in Spain has been more severe than in Germany, Austria or the EU reflects the relative severity of the health crisis and the measures applied under the state of alarm. Although the recovery in industrial production has been rapid, the relative severity of the shock in the Basque Country means that the challenges of recovery and renewal are greater than in "competing" regions such as Baden-Württemberg or Upper Austria with similar productive structures. In contrast, with regard to the services index (Graph 2.5), there is less specialization in services than Spain (especially in non-essential services such as tourism), although the fall in the index in the Basque Country has been greater than in other countries due to restrictive measures.

GRAPH 2.4 Industrial Production Index. Year-on-year rate (%)



Source: Compiled by authors based on Eustat and Eurostat data.

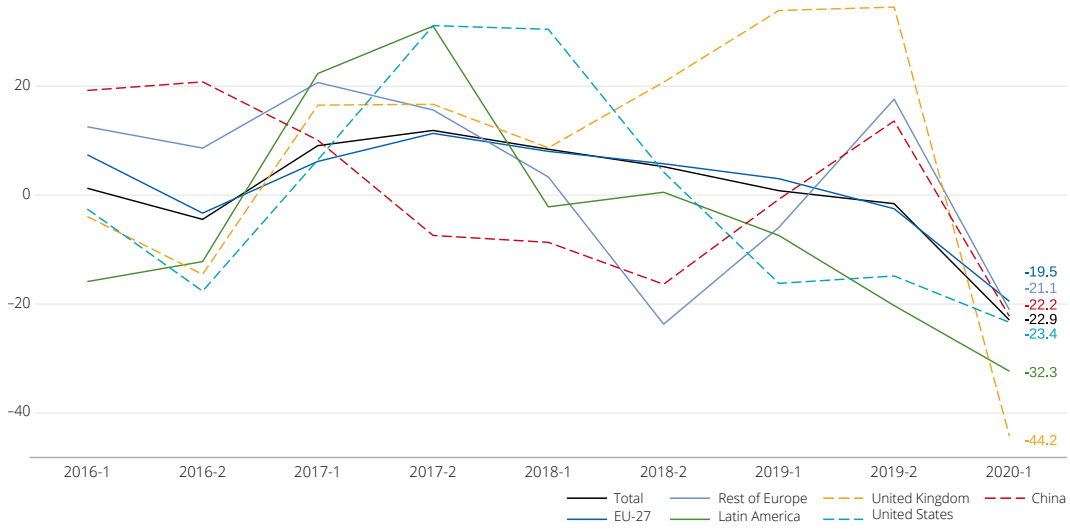
GRAPH 2.5 Services Index. Year-on-year rate (%)



Finally, coupled with the decline in production and partly as a result of temporary restrictions on imports and exports at the global level, there has been a drop in foreign trade activity. As shown in Graph 2.6, total exports contracted by 22.9% in the first half of 2020 compared to the same period last year. The decline has been particularly severe with respect to the United Kingdom, a trend that may reflect dynamics related to the United Kingdom's exit from the European Union.

Exports fell 22.9% in the first semester of 2020 with respect to the same period in 2019

GRAPH 2.6 Year-on-year rate of change (%) of Basque Country exports by destination



Source: Compiled by authors based on Eustat.

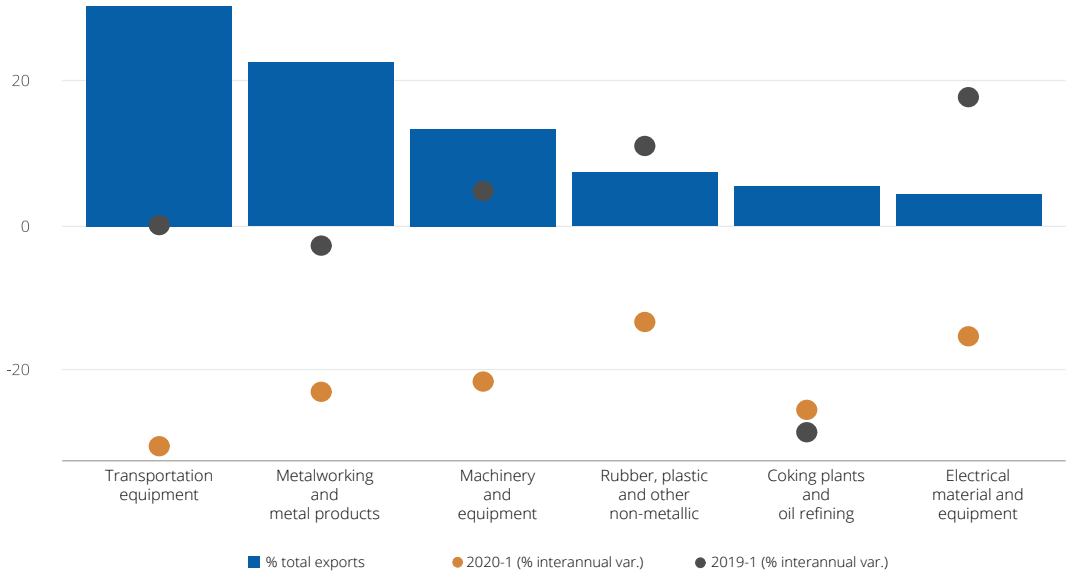
NB: 2015 base.

2.2 Asymmetric impacts by sector

This economic scenario does not affect all sectors in the same way. According to the Global Trade Update of the United Nations Conference on Trade and Development (UNCTAD), trade in the automotive and energy sectors has collapsed globally while agriculture and food industries have remained stable and others such as those related to trade in medical equipment have doubled.[21] These trends are reflected in the main industrial activities, accounting for almost 85% of total exports, which registered negative rates of between 13% and 30% in the first half of the year, compared to the same period in 2019 (Graph 2.7).

[21] UNCTAD. Global Trade Update. Jun 2020. More details at: https://unctad.org/en/pages/newsdetails.aspx?OriginalVersionID=2392

GRAPH 2.7 Variation in main exports from the Basque Country



Source: Compiled by authors based on Eustat.

Nota: 2015 base.

The asymmetric impacts of the crisis are determined by the degree of the demand shock and its interaction with several other factors that affect the capacity to maintain activity, such as the essentiality of the activity under the state of alarm, the degree of digitalization and/or servitization, the degree of integration into global supply chains, or relations with other sectors (see Box 1).

The impacts of the crisis are asymmetric across sectors

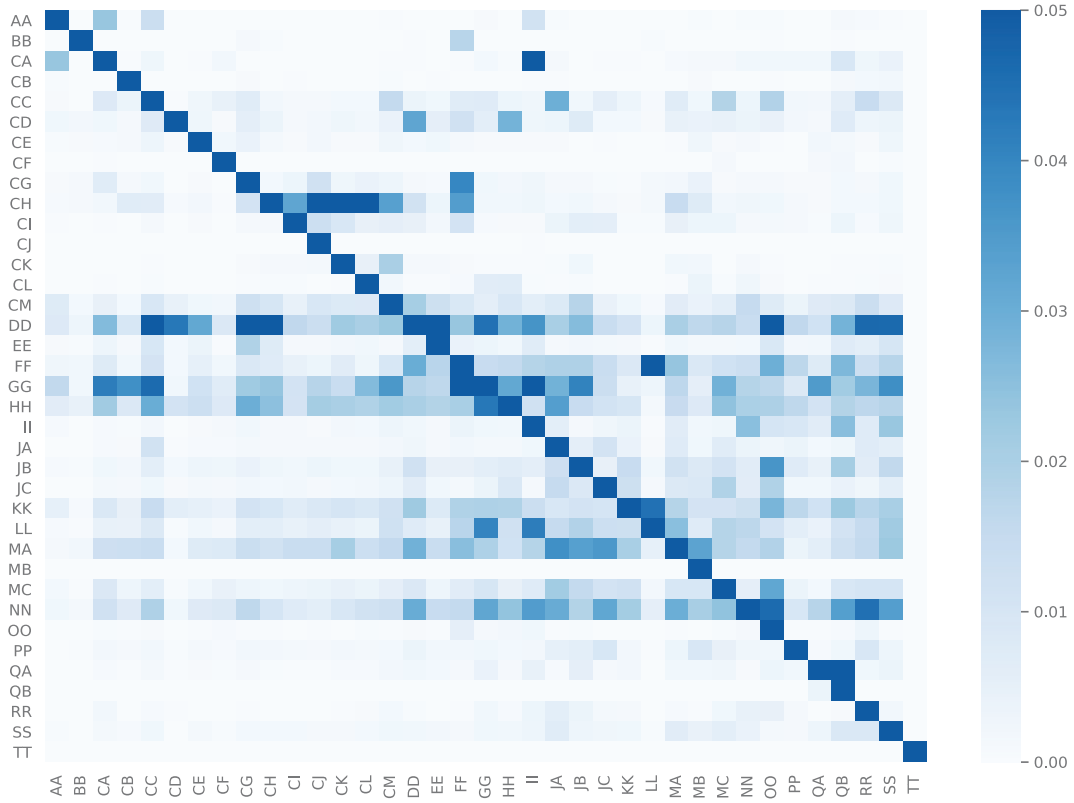
BOX 1 Interrelations between sectors

The fall recorded in production and especially in those sectors that are central to the Basque economy affects a network of inter-sectoral relations in which industries are supplied with the necessary inputs for their production. Such cross-sectoral relationships are typically quantified using Input-Output Tables (IOT), from which information is extracted on the total input production and distribution operations taking place in an economy in a given period of time. These relationships are built on the basis of the input needs of a branch of activity from other sectors.

It is possible to estimate the spillover effect that an industry has on other sectors and on the economy in general.[22] To illustrate such effects, Graph 2.8 presents the use of intermediate inputs produced within the Basque Country in the Basque economy: it illustrates the intensity of the use of inputs from each branch of activity coming from other branches of activity. The intensity of the color in each frame indicates a greater interdependence between branches and vice versa. It is noted that the links between manufacturing sectors are particularly strong, for example, the fall in production in Metallurgy and metal products (CH), recorded in the first half of the year, undoubtedly had an impact on production in other sectors such as Computer and electronic products (CI), Electrical material and equipment (CJ), Machinery and equipment (CK), and Transport equipment (CL).

[22] This is done through the calculation of the Leontief inverse matrix, which reports the multiplier effects that occur in the economy and is used to measure impacts (expansions or contractions). These impacts occur directly, also called "direct effects," through the matrix of technical coefficients and indirectly or "indirect effects" that are obtained through the links that each industrial sector has with the others.

GRAPH 2.8 Intensity of use of inputs produced in the Basque Country



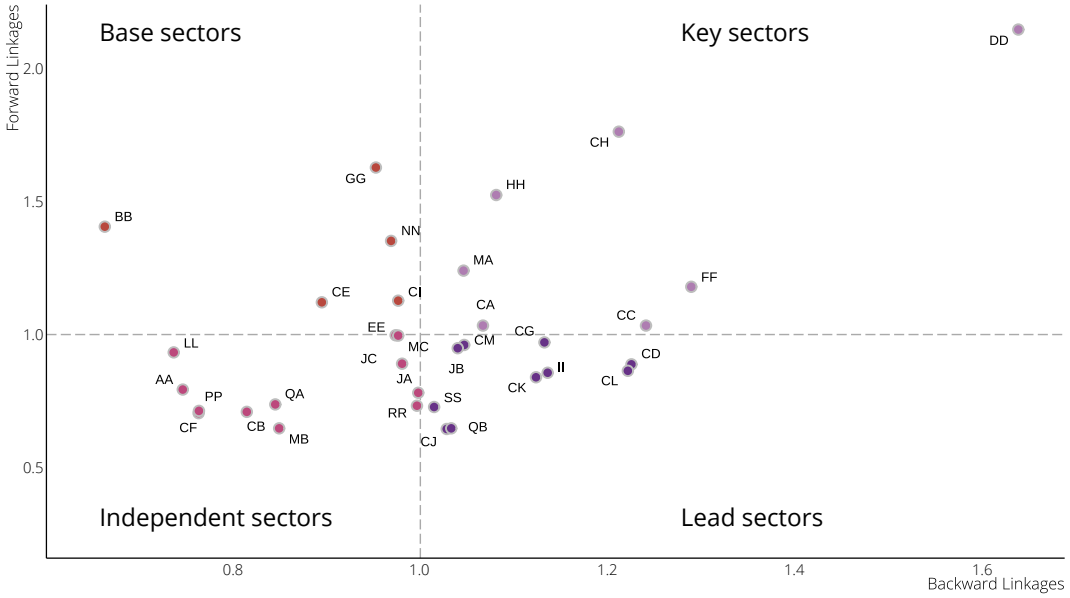
Source: Compiled by authors based on Eustat. A list of the sectors with their codes can be found in Table 2.1, or in Appendix 8.

Specific backward and forward linkages can also be calculated to establish the type of interdependence of each economic activity with the other productive sectors. Backward linkages are defined as the influence of a sector through its purchases of intermediate inputs from other sectors, while forward linkages indicate the importance of a sector through its sales. Based on these notions, industries can be classified as:

- **Key sectors,** if they have an important role in the flow of the entire economy because of their strong forward and backward linkages.
- **Base (or strategic) sectors,** if they provide goods and services to other sectors, have strong forward linkages, but do not demand inputs from others in any significant way
- **Lead sectors,** if they demand many inputs from other industries, have strong backward linkages, so changes in the final demand of this sector are important for the economy.
- **Independent sectors,** if they do not have significant impacts on the economy, because they do not have strong forward or backward linkages.

As a result of combining data on the forward and backward links in the case of the Basque Country, it is possible to classify the branches of economic activity according to this typology (Graph 2.9).

GRAPH 2.9 Typology of sectors according to their links with others in the Basque Country



Source: Compiled by authors based on Eustat. A list of the sectors with their codes can be found in Table 2.1, or in Appendix 8.

Table 2.1 shows some basic elements that may determine the way in which different sectors may be affected by the pandemic.[23] On the one hand, with regard to the capacity to maintain activity, some branches of activity are recognized as having a significant percentage of employment as essential. In aggregate, the sectors considered as essential services account for 52% of total employment in the Basque Country, and 48% have had limitations on the movement of their workers to the workplace. However, it is true that some branches of activity with a high percentage of activities considered essential have also redesigned their work processes to avoid physical assistance (e.g. indirect labor in different sectors or R&D), and in other cases activities not considered essential have been able to maintain their activity remotely thanks to the implementation or acceleration of digital solutions, as is the case of education or a minority part of the hospitality industry.

Likewise, the global nature of the pandemic has implied the establishment of barriers to international trade, creating difficulties in production, shipping, supply and transport in the different countries and affecting exports and imports. The sectors that export most (Transport material, Metallurgy and metal products, Machinery and equipment and Coking plants and oil refining) or import most (Extractive industries, Metallurgy and metal products and Transport material) have been more affected by these processes.

The sectors that export and/or import most have been more affected by the crisis

The degree of servitization is another factor that can influence the situation of firms to face the crisis, as indicated by studies carried out during the 2008 financial crisis (Cusumano *et al*., 2015). Of the sectors where data are available, those that obtain a greater percentage of their income from services are Computer and electronic prod-

[23] Appendix 8 contains a summary of enterprise characteristics (employment, size, value added, foreign equity) for these 38 sectors (by NACE 2-digit classification). More detailed analysis of the different dimensions can be found in Retegi *et al*. (2020).

ucts, Chemical and pharmaceutical industry, Transport equipment and Water supply and sanitation. However, taking into account the low level of income from services in general and the need to know which part of the services require contact between people and/or physical movement of workers, it is difficult to predict the effect that this variable may have.

Finally, from the analysis of the data relating to digitalization, the starting position of the various sectors with regard to their digital production and consumption is displayed. In this sense, the crisis arising from the pandemic is characterized in the short term by penalizing those sectors that require physical interaction or travel between people (for example, to the workplace due to the difficulty of working remotely), an issue that can be strongly mitigated by the degree of digitalization of their activities.

TABLE 2.1 Characteristics of sectors that determine the impact of the crisis and recovery potential

Sector A38	Sector A38 Code	% essential activities (employment)	Ratio Exports / GDP	Imports (thousand euros)	% of revenue from services	GDP (million euros)	Digital production (%)	Digital consumption (%)
Agriculture, livestock and fishing	AA	99.9%	14.0	691 373	0.4%	659	0.02	1.18
Extractive Industries	BB	0.0%	391.7	5 477 735	N D	39	0.00	2.98
Food, beverages and tobacco	CA	100.0%	86.7	716 323	0.8%	1 036	0.02	0.69
Textiles, apparel, leather and footwear	CB	60.4%	118.1	341 049	0.6%	109	0.02	1.60
Wood, paper and printing	CC	65.4%	98.1	528 101	1.6%	751	1.75	3.20
Manufacture of coke and refined petroleum products	CD	100.0%	556.1	347 104	0.0%	418	0.04	0.14
Chemical and pharmaceutical industry	CE/CF	90.1%	180.9	1 659 371	2.9%	593	0.08	2.13
Rubber, plastics and other non-metals	CG	96.7%	125.8	746 999	1.1%	1 572	0.09	1.41
Metallurgy and metal products	CH	0.0%	122.2	3 922 317	0.7%	4 728	0.09	0.87
Computer and electronic products	CI	99.5%	67.3	460 593	3.2%	440	83.23	49.46
Electrical materials and equipment	CJ	60.8%	184.9	823 282	1.6%	597	0.72	5.64
Machinery and equipment	CK	0.0%	201.0	1 626 210	1.6%	1 729	0.54	3.55
Transport equipment	CL	0.0%	383.8	2 144 824	2.4%	1 838	0.17	1.77
Furniture and other manufactured goods	CM	57.7%	31.3	273 560	1.1%	745	0.42	4.91
Electricity, gas and steam	DD	99.7%	—	—	1.4%	1 710	3.76	3.04

Sector A38	Sector A38 Code	% essential activities (employment)	Ratio Exports / GDP	Imports (thousand euros)	% of revenue from services	GDP (million euros)	Digital production (%)	Digital consumption (%)
Water supply and treatment	EE	100.0%	56.7	705 081	2.1%	468	0.02	2.04
Construction	FF	26.9%	—	—	N D	4 033	0.12	1.75
Commerce; vehicle repair	GG	54.6%	—	—	N D	7 373	1.62	4.29
Transport and storage	HH	78.1%	—	—	N D	3 445	0.05	3.46
Hospitality	II	66.7%	—	—	N D	3 759	0.01	1.33
Editing, video, radio and television	JA	66.8%	—	—	N D	381	85.75	27.19
Telecommunications	JB	100.0%	—	—	N D	900	94.17	45.24
Information technology	JC	73.6%	—	—	N D	785	88.93	53.62
Real estate activities	LL	0.0%	—	—	N D	7 817	x	2.86
Consultancy and technical activities	MA	100.0%	—	—	N D	3 063	0.62	8.59
Research and development	MB	95.6%	—	—	N D	455	1.56	7.13
Other professional activities	MC	81.1%	—	—	N D	517	0.66	9.82
Ancillary services	NN	64.9%	—	—	N D	2 121	0.33	5.27
Education	PP	0.0%	—	—	N D	3 684	0.24	8.51
Health care activities	QA	100.0%	—	—	N D	3 709	x	6.09
Social services activities	QB	45.0%	—	—	N D	724	x	4.35
Recreational and cultural activ.	RR	0.0%	—	—	N D	1 172	0.56	3.95
Other services	SS	54.7%	—	—	N D	1 058	0.99	7.11

Source: Compiled by authors based on Eustat and INE.

While these baseline conditions provide us with some information on the potential asymmetric impacts of the pandemic by sector, it is instructive to combine this with data showing an indication of the current impact by sector during the months of full disruption (March and April). Table 2.2 shows data on the persons affected by ERTEs,[24] the percentage they represent of the total employment in the branch of activity, the drop in Social Security affiliations during the month of March, and the change in the Industrial Production Index for the months of March and April, as compared with the same months in 2019.

[24] ERTE (Temporary Redundancy Plans) presented during the months of March and April.

TABLE 2.2 Initial impact of the crisis by sector

Sector A38	Sector A38 Code	ERTES (people affected)	ERTES (people affected) / total people in sector	Decrease in Social Security Enrollment (March 2020)	Increase in Industrial Production Index (March–April 2020 vs. 2019)
Agriculture, livestock and fishing	AA	459	3%	0%	N D
Extractive Industries	BB	145	33%	0%	–35%
Food, beverages and tobacco	CA	2 899	19%	12%	–10%
Textiles, apparel, leather and footwear	CB	1 089	42%	12%	–35%
Wood, paper and printing	CC	2 409	21%	12%	–7%
Manufacture of coke and refined petroleum products	CD	—	0%	12%	–10%
Chemical and pharmaceutical industry	CE/CF	1 200	24%	12%	–19%
Rubber, plastics and other non-metals	CG	3 881	19%	12%	–41%
Metallurgy and metal products	CH	24 457	34%	12%	–32%
Computer and electronic products	CI	978	14%	12%	–29%
Electrical materials and equipment	CJ	999	11%	12%	–25%
Machinery and equipment	CK	7 584	34%	12%	–20%
Transport equipment	CL	7 498	39%	12%	–48%
Furniture and other manufactured goods	CM	2 145	15%	12%	–14%
Electricity, gas and steam	DD	36	2%	0%	0%
Water supply and treatment	EE	379	6%	1%	1%
Construction	FF	7 210	12%	11%	N D
Commerce; vehicle repair	GG	31 529	23%	12%	N D
Transport and storage	HH	6 365	14%	5%	N D
Hospitality	II	38 462	64%	18%	N D
Editing, video, radio and television	JA	728	13%	2%	N D
Telecommunications	JB	83	4%	2%	N D
Information technology	JC	481	4%	2%	N D
Real estate activities	LL	798	14%	0%	N D
Consultancy and technical activities	MA	1 090	2%	5%	N D
Research and development	MB	433	6%	5%	N D
Other professional activities	MC	2 663	22%	5%	N D
Ancillary services	NN	7 419	12%	19%	N D
Education	PP	7 642	10%	10%	N D
Health care activities	QA	6 199	13%	–9%	N D
Social services activities	QB	2 270	8%	–9%	N D
Recreational and cultural activ.	RR	5 805	39%	6%	N D
Other services	SS	10 534	40%	4%	N D

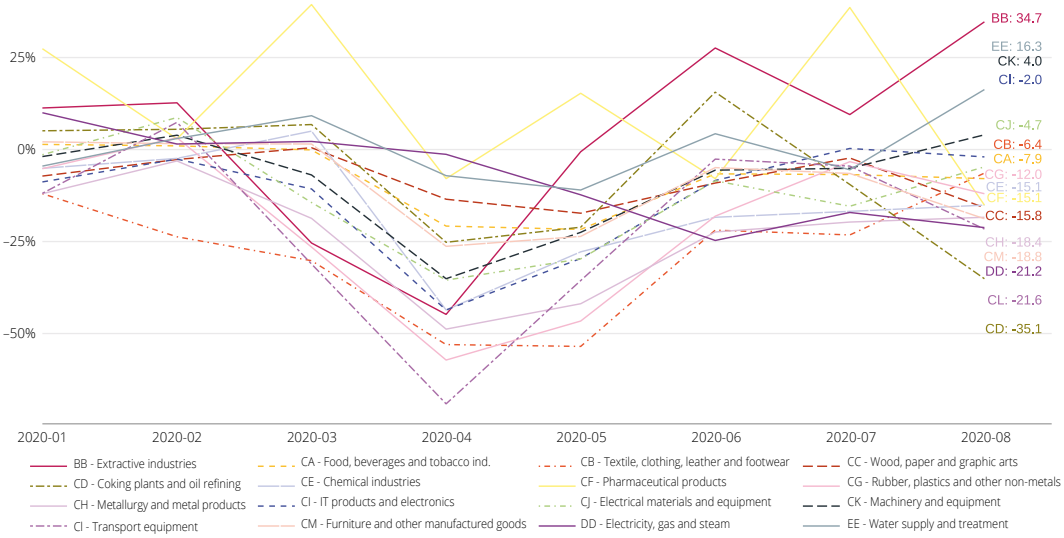
Source: Compiled by authors based on Open Data Euskadi, Eustat, and the Spanish Ministry of Inclusion, Social Security and Migration.

In terms of the number of workers included in ERTEs, hotel and catering, commerce, vehicle repair, metallurgy and metal products activities have been the most affected, while those related to energy and water or information and communication technologies have been the least affected. In general, it should be noted that those branches of activity in which the percentage of employment considered as an essential activity is 0% constitute the sectors with the greatest impact of the crisis in terms of ERTEs/total employment, and that the sectors with the least impact have been those declared almost entirely as essential activities.

The sectors most affected by temporary redundancies are those whose activity is classified as non-essential

Graph 2.10 shows the variation of the Industrial Production Index by sector during the months of January to August 2020 compared to the same months of the previous year. As can be seen, although the fall in activity due to the limitations established during the second half of March and the first half of April is generalized, there is considerable differentiation between sectors, with a reduction of only 1.3 % in electrical energy, gas and steam, to one of 68.8 % in transport material. There is also much heterogeneity with respect to recovery during the summer, and relapse in some cases.

GRAPH 2.10 Evolution of the Industrial Production Index by sector (January-August 2020)



Source: Compiled by authors based on Eustat.

2.3 Sector resilience in the short term

The asymmetry of the impacts of the pandemic by sector has implications, both with respect to the degree of resilience needed by their firms during the immediate crisis and with respect to the speed and degree of recovery during the current phase of "living with the virus." In practice, it will be the combination of the severity of the impact with the resilience of the sectors that will determine their trajectory in the coming months and years.

Several factors influence the resistance or, in other words, the short-term resilience of sectors. These include the degree of servitization (Glenn and Bandulet, 2013) and digitalization. Broadly speaking, firms and sectors that have already made progress in servitizing and/or digitalization will have a more sophisticated and/or diversified response capacity.

Firms that have made greater advances in servitization and digitalization tend to be more resilient in the short term

The geographic dependency on inputs is a dimension of vulnerability

Another element of vulnerability that has become evident during the health emergency has been the geographical dependence on inputs, something that is analyzed in Box 2. But the capacity of resistance to this vulnerability depends on the possibilities that firms have or create to change their behaviours. Thus, a firm currently dependent on global supply chains (and imports from China, for example) may decide to dispense with its more distant suppliers. But it can also be concluded that it is best to continue with them, incorporating more checks-and-balances in their management. It may even be concluded that it is not feasible to choose nearby suppliers, because of cost or quality issues, etc. Therefore, the options that firms may have to re-establish, reconsider, strengthen or reinvent supply chains may vary (Kamp *et al.*, 2020).

BOX 2 How much do Basque importers depend on a single country?

Authors: Juan de Lucio, Raúl Mínguez, Asier Minondo and Francisco Requena

The COVID-19 crisis has shown that a measure of confinement in a country located thousands of kilometers away can cause a production process to be paralyzed in the Basque Country. In this box, we analyze the degree of vulnerability of Basque firms to disruptions in global supply chains.

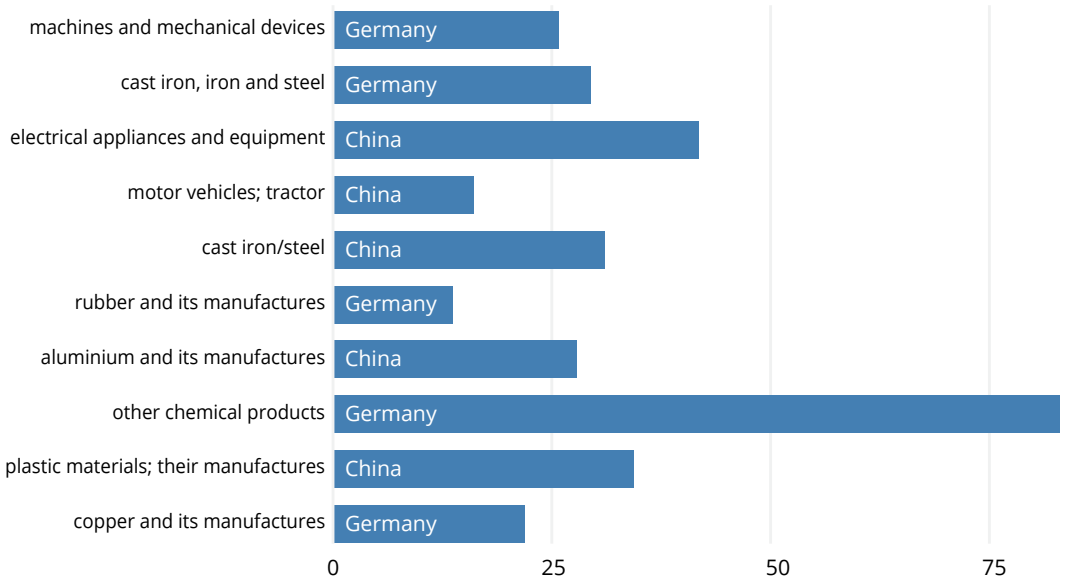
Following a similar methodology to that of Cernat and Guinea (2020), we calculate the number of countries from which a Basque firm imports a product.[25] In 2019 the median of Basque firms had only one supplier country for each imported product, and the average number of supplier countries per product was 1.5.[26] The dependence is similar between importing and exporting firms and importing-only firms. The countries that are most frequently the only suppliers are China (21%), Germany (16%), and Italy (11%). During the first half of 2020, which includes the four months in which the state of alarm was in effect, the median number of supplier countries per firm and product remained at one, and the average dropped to 1.3.

To measure the vulnerability of the Basque Country with respect to a single supplier country, we sum the value of imports of those products for which Basque firms have a single supplier and divide this by the total of Basque imports in 2019. 22% of Basque imports had only one supplier country, and half of Basque imports originated in three or fewer supplier countries. In Spain, dependence on a single supplier country stood at 19%. The Basque Country's dependence becomes more acute during the first half of 2020: the percentage of imports coming from a single country rises to 33% and almost 50% of imports come from two countries or less. In any case, these percentages cannot be compared with those of 2019, as they only include the first six months.

Graph 2.11 shows the degree of dependence in the 10 most important import chapters of the Basque Country, excluding fuels. These chapters represent 64% of Basque imports of goods. For each chapter, the single supplier country that is most common among importing firms is also shown. In most chapters, dependence on a single supplier is around 30% of imports. The highest dependence is in other chemicals, 86%, and the lowest in rubber and its manufactures, 14%. Dependence is also low in the automotive sector (16%). Germany and China are the most frequent suppliers.

[25] To perform this calculation, we used data from the Customs Department, and defined a product as an 8-digit code from the Combined Nomenclature (approximately 9 000 products).
[26] In Spain, the median of firms also had only one supplier country per product, and the average was 1.6.

GRAPH 2.11 Import dependence in the 10 most important non-energy chapters in the Basque Country, 2019 (%)



Source: Calculation of the authors from the data of the Customs Department

NB: Dependency is calculated as the percentage of total imports where the importing firm has a single supplier per product.

Graph 2.12 shows the variation of Basque import dependence on a single supplier country for three categories of importers: all importers, firms that import but do not export, and firms that import and export. Over the whole period 1997-2020, the dependence of exporting and importing firms is lower than that of importing only firms. Between 1997 and 2019, a reduction in dependence on a single supplier country is observed for all three categories of importers. In 2020, there will be a growth in dependence in all three categories of importers.

GRAPH 2.12 Percentage of total Basque imports from a single supplier country

Source: Calculation of the authors from the data of the Department of the Directorate General of Customs.

NB: Dependency is calculated as the percentage of total imports where the importing firm has a single supplier per product.

The COVID-19 crisis will likely encourage Basque firms to diversify their supplier portfolio. As Díaz-Mora *et al.* (2020) points out, these new suppliers are likely to be located in countries that are geographically close and participate in the same trade agreements, in order to respond more quickly to possible changes in demand and to reduce the risk in the event that trade rules are altered. In any case, finding new suppliers is not an easy task, especially in those cases where intermediate products have to be adapted to the characteristics of the importing firm.

Other factors determining the response capacity of the sectors are related to the socio-economic situation itself and its evolution. Despite the fact that, at the beginning of the crisis, some authors predicted a rapid "V" recovery in economic activity, there are various factors such as those related to epidemiological management and speed of development and distribution of vaccines, the impact of the COVID-19 in countries with which the Basque Country has commercial relations, the availability of a large workforce with the right skills, among others, which seem to indicate a progressive and relatively long recovery. The most recent OECD forecasts, for instance, indicate that the global economy will contract by 4.5% in 2020 (7.9% in the Eurozone) and grow by 5% in 2021 (5.1% in the Eurozone), while the Basque Government's Directorate of Economy and Planning estimates that the contraction in the Basque Country in 2020 will be 10.1%, with growth of 8.9% in 2021.[27]

Interaction between various factors suggests a progressive, relatively long and asymmetric recovery

Within this scenario of general uncertainty, the recovery period will vary depending on the characteristics of each sector, particularly with respect to restrictions related to epidemiological developments, the speed of activation of local and foreign demand, and the degree of restructuring or repositioning required (for example, in sectors such as automotive or energy that are highly affected by the energy transition). This scenario has been called "K" recovery, which shows an asymmetric recovery depending on the sector of activity.

Although no objective data are available on the possible future variation by sector, based on studies that attempt to forecast the recovery periods of the sectors according to their characteristics, in Table 2.3 a categorization of the different branches of activity in quartiles has been estimated (first quartile for the sectors with a probable short recovery and fourth quartile for those likely facing a long recovery).[28]

[27] One-Click Report, Department of Finance and Economy, Basque Government, October 2020.

[28] Due to its dependence on studies not specifically adapted to the Basque Country, this analysis has its limitations. It would be interesting to know first-hand the vision of Basque firms from different sectors on these issues, something that is currently being experimented with through the development of 'recovery roadmaps' by the Cluster Dynamizing Organizations (CDOs) within the framework of SPRI's cluster policy.

There are four categories of sectors according to their recovery scenarios

TABLE 2.3 Distribution of branches of activity according to predicted recovery period quartile

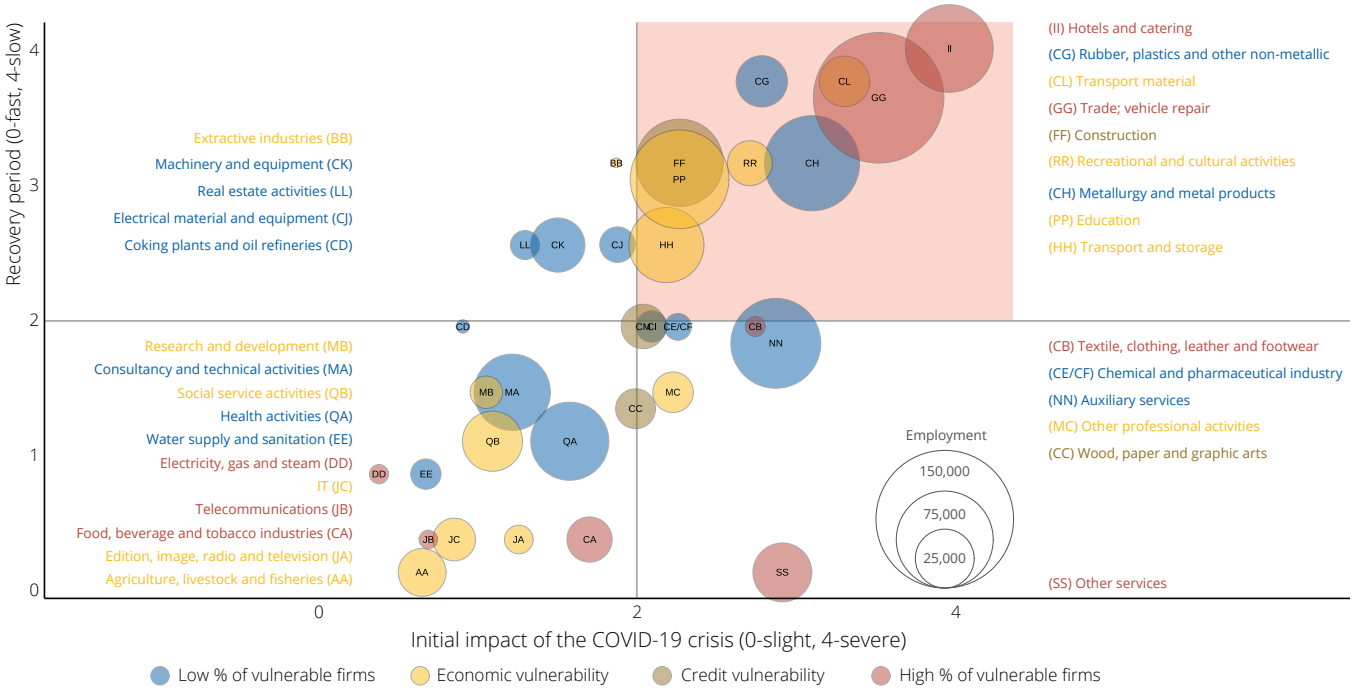
Sector A38	Quartile	Sector A38	Quartile
Hospitality	FOURTH QUARTILE	Computer and electronic products	SECOND QUARTILE
Rubber, plastics and other non-metals		Furniture and other manufactured goods	
Transport equipment		Ancillary services	
Commerce; vehicle repair		Consultancy and technical activities	
Extractive Industries		Research and development	
Metallurgy and metal products		Other professional activities	
Construction		Wood, paper and printing	
Recreational and cultural activ.		Health care activities	
Education	THIRD QUARTILE	Social services activities	FIRST QUARTILE
Electrical materials and equipment		Electricity, gas and steam	
Machinery and equipment		Water supply and treatment	
Transport and storage		Food, beverages and tobacco ind.	
Real estate activities		Editing, video, radio and television	
Textiles, apparel, leather and footwear		Telecommunications	
Manufacture of coke and refined petroleum products		Information technology	
Chemical and pharmaceutical industry		Agriculture, livestock and fishing	
		Other services	

Source: Compiled by authors base on PwC UK, PwC Spain, Monitor Deloitte, Eustat, and the Spanish Tax Agency.

Finally, much can be gleaned about the responsiveness of different sectors through an analysis of pre-existing economic-financial health. While chapter one includes an aggregate analysis of the economic-financial features of Basque firms, Graph 2.13 includes a breakdown by sector according to the concentration of firms with economic-financial pathologies, together with an assessment of the impact of the crisis on the likely period of recovery. On the horizontal axis, the sectors are positioned with respect to an assessment of the severity of the impact of the pandemic during the emergency resistance period (March-April 2020). On the vertical axis, the sectors are positioned with respect to the forecasts for their recovery. The sizes of the bubbles correspond to the weight of each sector in total employment in the Basque Country, and the colors of the bubbles represent a typology developed to reflect the percentage of firms with economic vulnerability (profitability) and/or financial vulnerability (solvency).[29]

[29] Appendix 9 contains the breakdown by sector of the number and proportion of firms considered vulnerable in economic and financial terms.

GRAPH 2.13 Risk by branch of activity in the Basque Country



Source: Retegi *et al.* (2020).

The economic and financial vulnerability of firms before the crisis is a key factor for policy-makers to consider

Although the complexity of the factors that determine both the impact and the response capacity of the different sectors makes it difficult to summarize, it is important to have tools to forecast the impact of the crisis in different sectors as a starting point for adapting policies. According to this analysis, the initial impact and the time needed for recovery will be particularly severe in the sectors located in the upper-right quadrant, which in turn include several sectors with high rates of economic and/or financial vulnerability. With regard to adapting policies to specific needs, three branches of activity stand out for their priority attention:

Understanding the characteristics of different sectors helps to prioritize support measures

- **Hotel and Catering (II)** and **Trade; vehicle repair (GG):** With a high concentration of firms with financial and economic vulnerability, they are particularly affected by the crisis due to the effects of confinement, the fall in consumption and the foreseeable subsequent decrease in disposable income as a result of the increase in unemployment. They also represent a high percentage of total employment in the Basque Country.
- **Transport equipment (CL):** There has been a strong impact on its activity (–68.8% in the initial months, although it has recovered moderately afterwards) at a time when it is immersed in a process of transformation related to digital and green transitions. Although it does not have as high a percentage of employment in the Basque Country as other sectors, it is a lead industrial sector that pulls other sectors through its positioning in global value chains.

A heterogeneous array of sectors can be considered a second level of priority, due to the impacts of the crisis:

- **Metallurgy and metal products (CH)** and **Rubber, plastic and other non-metallic (CG):** Highly exporting industrial sectors, and the former in particular, considered a key sector due to its ability to pull the economy forward.
- **Construction (FF)** and **Transport and Storage (HH):** Sectors closely linked to economic activity, scarcely digitalized and not considered 'essential,' and with a high incidence on total employment in the Basque Country.
- **Recreational and cultural activities (RR)** and **Education (PP):** Both are highly affected by limitations in attendance and mobility, but the latter, in particular, has a high potential to adapt to the situation relatively quickly.

In addition to the above, the sectors of **Textile, clothing, leather and footwear (CB)**, **Furniture and other manufacturing (CM)** and **Extractive industries (BB)** deserve special attention because of the concentration of firms with financial pathologies, although the impact of the pandemic and prognosis for recovery are not as severe. Finally, the **Auxiliary Services (NN)** branch of activity stands out for its high employment and strong initial impact, although the expected recovery period is not particularly severe, and the financial conditions of firms are relatively healthy.[30]

In short, the analysis carried out shows how the initial impact of the crisis has been asymmetrical in the Basque Country, and that the recovery will follow heterogeneous sectoral patterns, depending also on the concentration of firms with economic and/or financial vulnerability in those sectors before the crisis. Therefore, policy measures should take into account these differentiating features.

Recovery will follow heterogenous sectoral patterns

[30] See Retegi *et al*. (2020) for more detailed analysis of each of these sectors.

3
Resisting the pandemic: Short-term responses

The short-term responses provoked at the moment in which a shock occurs are an important element of resilience. The pandemic has been an extraordinary event, unknown for our generations, and one in which each company, institution and individual has had to respond to the impacts in different ways, many of them through radical changes in their day-to-day activities as well as in their strategies for the future. In the second half of 2020, restrictions are still in place in many sectors and in specific territories, and there are signs that Europe is entering a second wave of infections and another health crisis. In this context, almost all areas of socio-economic activity have had to adapt in some way to a new scenario of 'living with the virus' and it is also likely that the recovery of certain sectors will be interrupted and/or prolonged. We continue to be in a phase of resistance to the pandemic, therefore, but with a clear focus also on reconstruction and renewal in the medium- to long-term.

We shouldn't underestimate the difficulty of responding to a crisis without precedent in our lifetimes

It is important not to underestimate the difficulty of responding to such a unique context, one that is characterised by so much uncertainty, both for the business fabric as a whole (from large firms to micro-enterprises) and for those responsible for formulating public policies.[31] This chapter focuses on two types of response. Firstly, business responses to digitisation are analyzed, a critical area both for withstanding the short-term impacts of the pandemic in many sectors as well as for building competitiveness in the future. Secondly, there is an analysis of the policies implemented to date —both in the Basque Country and in other regions that share similar industrial structures— that aim to support firms and citizens in their efforts to survive the shock and to lay the foundations for recovery.

3.1 Digitalisation as a business response

The initial response to the health emergency meant that almost all activities had to adapt rapidly to a new and completely different set of circumstances in which, from the outset, the technological-digital system has laid a large part of its potential on the table. The incalculable advantages that digital technologies bring to society are

[31] The analysis of this Chapter is based in large part on the background papers of Zubillaga and Peletier (2020) and Magro *et al.* (2020), where further detail on various of the elements analyzed can be found.

not unknown, but in exceptional situations such as now, their capacity to influence all those facets of our lives in which they are present is becoming ever more reinforced.

The digital transition we are immersed in was already well-internalized before the pandemic, as is reflected in the emphasis placed on helping firms to face this transition both in the European Commission's industrial policy (European Commission 2020a), as well as in the strategic and economic bases of the new Plan for Science, Technology and Innovation (PCTI) 2030 (Basque Government, 2019), and in the adoption of initiatives such as the *Digital Innovation Hubs* within the current Basque RIS3 (Aranguren *et al*., 2019). With this crisis, however, many firms have launched an 'express digital transformation' as an immediate response to their situation. This resilience, in the short term, is mainly to be seen in areas of activity that already had a certain level of digital maturity or that have innovative capacity. However, other firms that did not previously had a vision of the potential of technology beyond means of payment or online sales have also adapted. Although it has come about as a necessity, this situation implies a whole series of learnings that, if taken full advantage of, will positively influence the digital transition that will build resilience in the medium- and long-term.

The pandemic has accelerated digital transition

Business responses to the pandemic may be conceptualized in terms of a sequential framework. The sequence begins with an incident —the presence of the virus in the population— that leads to regulatory reactions on the part of governments. These reactions imply the activation of a series of mechanisms, or triggers, that then have consequences or impacts of an enabling or disabling type on firms. Thus, the declaration of a state of alarm gave rise to a series of provisions regarding limitations on movements, declarations of essential activities, limitations on the transport of people and of goods, essential activities (supplies and logistics), among others. This set of triggers, taken together, has different types of impacts on business activity and affects normal activities. In order to be able to address these impacts, firms develop different kinds of responses, which have effects or consequences.

The impacts brought about by the different triggers are highly varied in terms of their type and the intensity of their effects on firms. Indeed, as the analysis in Chapter Two shows, some of the triggers more directly affect certain sectors or branches of activity. Among the main triggers, the one that stands out as most restrictive is the closure of activities. One of the most far-reaching impacts has been the impossibility of carrying out professional activity in the workplace itself in most economic sectors, a limitation that has obliged firms and workers to make notable changes in the way they operate, which also extends to the way they handle their face-to-face relations with customers or clients. On the other hand, supply chains and channels have frequently been interrupted or broken, forcing firms to look for alternative ways of selling their products or gaining access to their customers. Some impacts have come from demand itself, which has changed its consumption patterns and needs, including with rapid increases in demand for certain categories of products. Faced with these new situations, firms have been forced to react swiftly.

TABLE 3.1 Typology of business responses to the impacts of the crisis on their activity

		Featured examples	Relevant technological component
Product Adjusting the suitability of the product to its demand	**The same product** Demand increases	· COMMUNICATION · Cybersecurity systems · *Webcams* ...	Generally, the product is itself of a technological nature
	New product (for the firm or for the market) Existing demand increases or there is a new demand	· 3D printing technology used to make masks or protective screens · Development of applications for use in healthcare	
	The same or a new product Need to adapt it	· Thermal cameras for controlling access · New audiovisual content (television programmes made from home, webinars, online courses etc.)	Product of a technological nature or online channel (television, application, social networks)
Process Implementing new processes	**Teleworking / teleassistance**	· Videoconferencing · Secure connections · Document-sharing tools · Remote access · Remote desktop	Product of a technological nature
	Open innovation	· Partnerships, either between companies or public-private · Shared value initiatives · Maker communities	
	Marketing / Communication	· Virtual interaction · Loyalty system	Less developed own online (email) or public (social networks, platforms etc.) channel
Channel (own/public) Digital channel as a solution to sales maintenance	**Digital**	· Online sales as a continuation of the habitual activity · Strengthening of online sales owing to, for example, the breakdown of the habitual distribution channel (meat products)	Own online or channel (web, platform, application, social networks, etc.)
	Mix (online-to-offline)	· Online / telephone orders and face-to-face collection or home delivery	

Source: Zubillaga and Peletier (2020).

Three types of digital responses can be distinguished: product, process and channel

The responses by firms to some of these triggers and their impacts have implied changes in some aspects of their business models, on different levels. The report compiled by Zubillaga and Peletier (2020) has documented and analyzed around 20 business cases in the Basque Country and shows the variety of responses in the field of digitalisation. Based on this analysis, Table 3.1 presents a typology that distinguishes three of these levels (product, process and channel), and illustrates, by means of a series of examples, how some firms and sectors have carried out initiatives to counteract the impacts deriving from the crisis. These are responses that involve some type of technological component as a central element.[32]

[32] The analysis is based on interviews focused on: (1) their conditions previous to the pandemic; (2) their reactions and decisions taken; and (3) perspectives with respect to future scenarios of evolution of the pandemic and the potential consequences in their sectors and activity. Analysis of the cases in contained in Zubillaga and Peletier (2020).

At the level of the product, three types of response stand out. On the one hand, there are those in which no new product has been required, nor any changes have been needed in the existing one. The reason is that these are products (or services) whose demand has increased due to the crisis. This is the case of technological products such as webcams, cybersecurity services for safe connections, both either related to the implementation of teleworking or as virtual communication tools, for professional or personal reasons.

In other cases, the response to satisfy the surge in demand has resulted in a new product, either for the firm, which has changed its habitual mode of production for a product that has been in great demand during the crisis (firms with 3D printing technology have turned it to the manufacture of masks or protection screens), or the market itself, such as applications that have been developed to evaluate possible symptoms of the disease. There is also a third case, what might be considered the result of adaptive innovation. Thermal cameras, for example, have been adapted to measure the temperature of people as they access workplaces, and audiovisual content, remote education, webinars etc. have adapted their formats to adjust to new needs based on the online channel, which has given rise to them being conceived of differently.

Among the responses that could, in a general sense, be regarded as process-based are teleworking and teleassistance (for example, for machines). For this to be possible, communication tools, document sharing, remote and secure access and connections are all essential. There have also been other types of response in the technological field, or of a cooperative nature. Some public institutions together with the health sector and technology firms have come up with open innovation initiatives that have had very satisfactory results. Many companies have also collaborated from the vision of creating 'shared value' for society and themselves (Porter and Kramer, 2011), by making their transportation systems, for example, available to others or forming joint action groups such as the maker communities (see www.covideuskadi.net). Finally, the online channel has also given rise to responses at the level of marketing or communication with the customer, or with the commercial network itself. Thus, by means of the use of platforms or social networks, some firms have offered their customers or other interested people interactive proposals, such as wine and beer tastings.

Lastly, firms have had responses that are focused on the digital channel, both their own (email, web, application) and public channels (social networks, platforms). In some cases, this has not meant any particular change regarding the use they had already made of this channel, but in others it has been necessary to strengthen or boost it (the meat sector, for example, has changed its focus from the hospitality sector to the private customer) by means of a vigorous campaign through the online channel. In this sense firms redirect their products on offer to new customers and are changing their mentality to remain relevant. It is also worth highlighting the hybrid, or 'online-to-offline' model, which implies beginning the purchasing process via one channel and finishing it in another. This solution has been adopted by bars and restaurants while they are closed to the public, and they take orders either by telephone or through social networks or the web, and customers then either pick it up in person or have it sent to their home.

The hybrid 'online-to-offline' model has been employed by many hospitality establishments

3.2 Policies as a response

The socio-economic crisis caused by the COVID-19 pandemic has had asymmetric impacts in different territorial areas and regions, despite its global nature. Thus, as is shown by the economic indicators at the present time and the sectoral impacts discussed in Chapter Two, there is territorial variability in the impacts of the crisis. The reasons that can be put forward from the economic geography literature to explain a given area's vulnerability to a crisis focus on understanding the scale and the duration of the shock that causes it, the territory's productive structure and the responses in terms of public policies and governance implemented in the short, medium and long terms.

Responses in terms of public policies and governance affect the vulnerability of territories

This section focuses precisely on exploring the role of policy measures and governance in the context of three regions that share a similar productive structure and which, therefore, also face shared challenges when confronting the crisis: Baden-Württemberg, Upper Austria and the Basque Country. The analysis focuses on measures that were implemented during the phase of resistance to the crisis, which were aimed at fostering the short-term resilience of the three territories. However, the broad outlines of the European recovery agenda, which will influence medium- and long-term resilience, are also presented.

Baden-Württemberg, Upper Austria and the Basque Country share challenges in confronting the crisis

3.2.1 Measures aimed at fostering short-term resilience

Institutional responses aimed at fostering short-term economic resilience in European countries have focused on mitigating the impact on employment, firms and the economy. Funding mechanisms put in place by the European Commission have allowed for the mobilization of funds for this purpose. The monetary and fiscal policy measures, as well as the financial and investment ones, are summarized in Table 3.2.

TABLE 3.2 The European response to the pandemic emergency

	Initiative	Description	Budget
Policy measures	Pandemic Emergency Purchase Programme (PEPP) (European Central Bank).	Purchase of public and private assets	€1.35 billion
Financial measures aimed at mitigating the impact on employment, firms and the economy.	The SURE initiative (Temporary Support to Mitigate Unemployment Risks in an Emergency)	Loans made to Member States in favourable conditions to allow them to meet the costs of measures implemented to reduce working time in production systems.	€100,000 million
	Pan-European Guarantee Fund (European Investment Bank)	Financing packages aimed at providing small and medium-sized companies with liquidity through guarantee funds	€200,000 million
Fiscal policy measures	Giving the Stability and Growth Pact more flexibility by activating the safeguard clause	Allowing Member States to run up deficits of more than 2% of GDP	
	Temporary frameworks for state aid permitted	Giving European countries' economies liquidity	
Investment measures	Investment Initiative in Response to Coronavirus	An investment initiative to provide Member States with immediate liquidity for the purchase of medical supplies, supporting SMEs or maintaining employment	€37,000 million
	Solidarity fund	Expansion of the fund to finance immediate response measures to the pandemic	€800,000 million

Source: Compiled by authors based on European Commission (https://ec.europa.eu/info/live-work-travel-eu/health/coronavirus-response/overview-commissions-response_es).

European Union measures are aimed at mitigating impacts in employment and providing support to SMEs

In short, at the beginning of the resistance phase, the European Union put macroeconomic measures in place: **Monetary** and **fiscal policy** aimed at supporting the maintenance of jobs and giving help to SMEs by providing them with liquidity. It is important to stress that the funds mobilized do not come exclusively from the EU budget, but from national governments, which can make use of the flexibility of European regulations and the safeguard clause of the Stability and Growth Pact to deal with the pandemic

The national responses of Germany, Austria and Spain have focused on the same lines, as can be observed in Table 3.3. The State measures implemented in the socio-economic sphere during the resistance phase of the pandemic have been mainly aimed at protecting employment (flexibility) and providing companies with liquidity, with emphasis being placed on SMEs and credit guarantee measures. They are measures that share common characteristics and objectives, although there may be variations in the specifics from country to country. The measures implemented in the social, health and research framework should be added to these.

TABLE 3.3 National responses aimed at the business fabric during the emergency phase

	Germany	Austria	Spain
Measures aimed at protecting employment	*Kurzarbeit.*	Corona short-time work (Corona-Kurzarbeit).	ERTE furloughing scheme.
Measures aimed at providing firms and the self-employed with liquidity	Credit line 100% guaranteed by the Federal Government *(KfW).*	Credit lines guaranteed by the Federal Government *(AWS bridging guarantee).* Specific credit line to cover the falls in exports both for SMEs and the rest of companies (OeKB credit line for export companies)	The Instituto de Crédito Oficial (ICO) guarantee line has been set up, through which the State provides guarantees for the granting of loans to companies (up to 80% in the case of SMEs and the self-employed and 60% for the rest).
	Direct aid for SMEs and the self-employed (Corona-Soforthilfen).	Direct aid for SMEs and the self-employed *(Hardship Fund).*	Direct aid for the self-employed.
	Tax and social security deferral measures.		
Sectoral measures	Aid programmes for companies in the hospitality, tourism, arts and cultural sectors.		

Source: Compiled by the authors with data from the Austrian Federal Ministry of Finance (www.bmf.gv.at); the Federal Government of Germany (www.bundesregierung.de); Ministry of Economic Affairs and Digital Transformation of Spain (www.mineco.es).

The severity of restrictions and the productive specialization influence the asymmetric territorial impacts of the crisis

Together with the existence of state aid frameworks and European financing mechanisms, European regions implemented new measures in the initial phase of the crisis, either by modifying existing programmes and instruments, or creating new ones. The socio-economic crisis brought about by COVID-19 has had an asymmetric territorial impact (OECD, 2020), depending on several factors, among which the severity of the restrictions imposed in different contexts during the emergency phase and the productive specialization in sectors that depend on the mobility of people or which are inserted in global value chains stand out. The three regions analyzed (Upper Austria, the Basque Country and Baden-Württemberg) share similar productive specialization characteristics and have a similar socio-economic risk potential in the crisis (Böhme and Besana, 2020). In this sense, it is logical that the policy measures implemented in an initial resistance phase, even though they are adapted to the context of each region, should show common features.

The three regions analysed have developed similar measures to address the new context

The measures focus on two key dimensions: sustaining the financial situation of companies to keep economic life going and **supporting companies in the process of digitization** to cope with the new context. In addition, other measures such as support for R&D projects for the management of the pandemic or specific sectoral support for those most affected, such as tourism and culture, stand out.

Supporting the financial situation of companies

The three regions have implemented measures aimed at providing companies with liquidity in order to reduce cash flow tensions and safeguard business opportunities for investment. One thing that stands out is the orientation of the measures adopted towards SMEs and their cross-cutting nature to all sectors, as well as the emphasis on compensating for the drop in exports. The portfolio of measures implemented includes non-refundable grants, credit guarantee instruments, payment deferrals and advance repayment of advances or lines of credit in the form of repayable aid for the restructuring and relaunch of companies in difficulties. By way of illustration, Table 3.4 lists the most significant in each of the regions.[33]

Efforts have been focused on supporting SMEs in all sectors

TABLE 3.4 Main measures taken at regional level to support the financial situation of companies

Basque Country	Credit guarantee measures aimed at the self-employed and SMEs (0% financing line for SMEs and the self-employed from Elkargi and the Basque Government).
	Payment deferrals, advanced reimbursement of advances (INDARTU, rentals in SPRILUR industrial estates, Gauzatu Industria, Bideratu, Bideratu Berria).
	Refundable aid for restructuring and relaunching firms in difficulty (Bideratu COVID-19).
Upper Austria	Non-repayable grants, aimed at small businesses *(Härtefonds für Kleinbetriebe).*
	Credit guarantee instruments for medium and large companies *(Landeshaftungen für Mittelstand und Großbetriebe).*
	Credit guarantee instruments for small companies *(Corona-Bürgschaft für Kleinbetriebe).*
Baden-Wurtemberg	Non-repayable grants, aimed at small and medium businesses *(Corona Soforthilfe).*
	Credit guarantee instruments for exporting companies.
	Payment deferrals *(Landesbank Program).*
	Repayable loans for companies with up to 500 employees *(Liquiditätskredit Plus der L-Bank).*

Source: Compiled by authors based on Magro *et al.* (2020).

Digitalization

In the digitalization dimension, the three regions analyzed have all implemented: measures in the field of digital solutions with the aim of allowing companies to continue their activity in the face of mobility restrictions (for example, *Digitalisierungspaket* in Upper Austria, *INPLANTALARIAK* and *INDUSTRIA DIGITALA COVID-19* in the Basque Country); measures aimed at supporting cybersecurity; and other measures aimed at strengthening digital infrastructures. It should be pointed out that a great many of these measures were already in place but have been adapted and intensified ow-

Many of the measures that already existed to consolidate digital structures have been strengthened

[33] The summary of regional support measures taken in Baden-Württemberg, Upper Austria and the Basque Country is included in Appendix 10 and a more detailed analysis can be found in Magro *et al.* (2020).

ing to the exceptional circumstances brought about by the pandemic, reinforcing the business responses discussed in the first part of this chapter.

Other measures

In addition to these measures, the regions in question have others available in their portfolios, with different objectives. Among them are support for R&D&i in the Basque Country, aimed at providing a short term response to the crisis at the same time as new products and solutions are developed, not only among knowledge organizations but also among companies (*Aid for COVID-R&D-BC*). Moreover, in Baden-Württemberg they have implemented a fund to participate in the capital of medium-sized companies that are of relevance to regional value chains (*Beteiligungsfonds für den Mittelstand*), a measure that not only aims to reduce the cash-flow tensions of these companies but also to help lead companies to anchor themselves in the region. It is also of interest to point out how specific programmes in Baden-Württemberg and Upper Austria have been developed around the creation of new companies, with the aim of guaranteeing their viability and growth in the context of the crisis. Lastly, also worthy of mention is the extraordinary aid granted to independent and self-employed workers by the Basque Employment Service in the Basque Country, with the aim of supporting entrepreneurs and freelancers.

The Basque Country has developed a series of specific support measures for R&D&I and workers

In short, at regional level, the measures implemented to strengthen short-term resilience have been focused on supporting the solvency of companies, mainly SMEs, by means of different instruments, on the one hand, and helping the digitalization of economic activity on the other, in order to meet the needs brought about by the pandemic emergency.

Subregional measures in the Basque Country

The unique governance of the Basque Country when compared to other European regions means that, in addition to those of the regional government, the Provincial Councils have launched their own measures to provide support during the resistance phase and to foster the later recovery. Thus, the Provincial Council of Bizkaia has promoted the «Bizkaia Aurrera» initiative, the Provincial Council of Alava its «Plan Á» and the Provincial Council of Gipuzkoa its 'Economic and Social Recovery Plan'. Although they are different measures that are adapted to their own territorial contexts, the three initiatives have the following points in common:

- Fostering employment.
- Financial support for companies, particularly small enterprises.
- Support for the cultural, creative and sports sectors.
- Support for local consumption.
- Sectoral support (construction, the agrarian sector, tourism).
- Help for digitalization.
- Sustainability initiatives (circular economy, renewables, electric mobility).
- Tax and fiscal measures.

That is to say, the Provincial Councils, alongside regional measures, focus on supporting small enterprises in their territories by means of financial instruments, support and advice measures, fiscal instruments related to their tax-raising powers, and sector-specific measures (construction, tourism, the agrarian sector, cultural and creative industries, etc.). What also stands out is the orientation of the measures towards digital and sustainable transition, from which it can be concluded that they are initiatives that combine short-term and long-term resilience objectives.

The measures of the Provincial Councils focus on small firms and on the digital and green transitions

3.2.2 Measures aimed at fostering long-term resilience

Although it is still necessary to continue supporting companies in many sectors with short-term resilience measures, depending on their recovery period (see Chapter Two), public administrations are already preparing the strategic bases for economic recovery, guided by the European recovery plan (*Next Generation EU*). The recovery plan, which is committed to European growth based on the *European Green Deal* and the digital transition, is based on three pillars: (1) helping member states to recover; (2) re-launching the economy and supporting private investment; and (3) learning from the experience of the crisis.

On July 21, 2020, the European Commission adopted the recovery plan and agreed that of the €750 billion of the *Next Generation EU* budget, €390 billion will be provided in the form of non-refundable grants. The main mechanism of the Recovery Plan (*Next Generation EU*) is the so-called Recovery and Resilience Mechanism, which has a budget of €672.5 billion. Together with this mechanism, an additional reinforcement of cohesion funds for member states and European regions has been approved (Recovery Assistance for Cohesion and the Territories of Europe: *React-EU*) with a special focus on economic competitiveness, the European Green Deal and the digital transition in such a way as to facilitate territorial convergence in the recovery phase.

On September 17, 2020, the European Commission presented a guide with strategic orientations to the Member States with the aim of guiding the national recovery plans (European Commission, 2020c). Among these orientations, the prioritization of investments in flagship projects in the following areas stands out:

The *Next Generation EU* Recovery plan prioritizes investments in flagship projects for sustainability and digitalization

1. Acceleration of the development and use of renewable energies.
2. Improving the energy efficiency of public and private buildings.
3. Promotion of clean technologies with future prospects in order to accelerate the use of sustainable, accessible and intelligent transport.
4. Rapid deployment of fast broadband services in all regions and households, including fiber and 5G networks.
5. Digitalization of public administrations.
6. Increasing European industrial capacities for cloud data and developing state-of-the-art, sustainable, maximum-power processors.
7. Adaptation of education systems in support of digital competences and vocational education and training at all ages.

In addition to these guidelines, the European Union makes aid conditional on Member States addressing the reforms and economic policy challenges contained in the

country-specific recommendations of recent years, and in particular in the 2019 and 2020 cycles of the *European Semester*.

The recovery strategy of the Basque Government focuses on three transitions: digital-technological, climate-energy and social-demographic

In line with the main areas laid down for European recovery, the Basque Government presented the bases of its Programme for the Economic Reactivation and Employment of the Basque Country 2020-2024, taking into account the three transitions (technological-digital, energy-climatic and demographic-social) with a budget of more than €10,000 million. Depending on the way European funds to the regions are structured, this programme may see an increase in its budget. Nevertheless, European funds to the regions will be channeled through the Member States. It is, therefore, relevant to reflect on one of the lessons learned from the health emergency, namely the issue of co-governance in decision-making. Thus, based on the analysis of governance during the resistance phase, the suitability of establishing models of co-governance that take into account both the context and the emergency nature and complexity of the current crisis, and that are always based on a mechanism of reciprocity, is highlighted.[34]

In short, after an initial moment of resistance to the pandemic with its consequent socio-economic impacts on the territories, political measures now need to be aimed at promoting long-term regional resilience around the three transitions within the European framework for recovery and a greater role of the regions in this process, by means of co-governance mechanisms.

[34] For more detail of this analysis see Magro *et al.* (2020).

4
Resilience after the pandemic: Rebuild, renovate, transform

The short-term future scenario is marked by great uncertainty

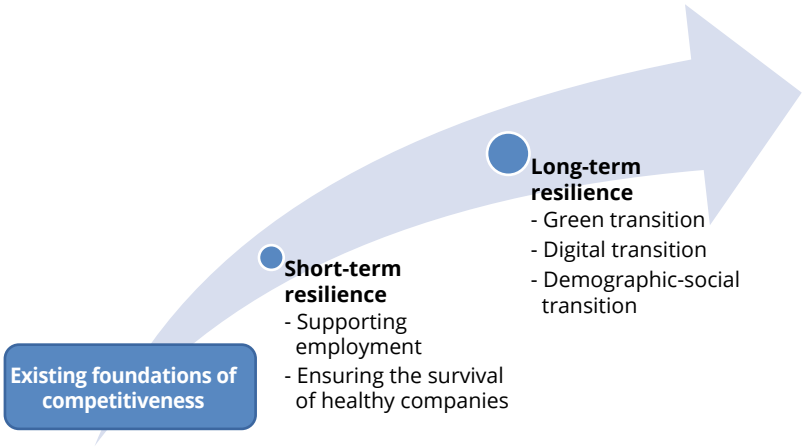
After analyzing the foundations of competitiveness of the Basque Country in the period before the pandemic and exploring both the immediate impacts of the socio-economic crisis that began in March 2020 and some of the responses that have come in the short term, this chapter looks to the future. According to a recent report by the *Boston Consulting Group* (2020), macroeconomic prospects depend on the interaction between the development of health technologies (vaccines, therapeutics and diagnostics), the way society behaves, government policies and business responses. This interaction is impossible to predict and the same report recommends that governments develop actions that will have positive impacts regardless of the future scenario (rapid recovery, cautious confidence, false euphoria or prolonged drought).

The advance of a second wave of the pandemic during the autumn of 2020 means that the seriousness of the situation we will be facing over the next year must not be underestimated, and neither should the challenges that await. We face the future with greater uncertainty than we are accustomed to and with elements that are difficult to control, such as the evolution of the pandemic in terms of health. However, even within this difficult context, embracing a perspective of resilience understood as the capacity to change, to adapt and to transform continually helps us formulate recommendations for action.

Long-term resilience depends on how we face the three transitions

This evolutionary perspective of resilience emphasises the importance of working with different time horizons. Resilience cannot be built from one day to the next, but building it requires both looking back and understanding the fundamentals of our competitiveness, and looking forward with both dipped headlights and full beam headlights in order to glimpse the future and adopt relevant measures as different scenarios develop. In this sense, although the current pandemic is not going to go away for some time, and it will be necessary to continue adopting measures to sustain employment and ensure the survival of healthy companies, it is clear that we also face profound challenges with respect to the three transitions that will determine the resilience of our society in the long term (Illustration 4.1).

ILLUSTRATION 4.1 Resilience in different time horizons



The conclusions and recommendations in this last Chapter are rooted in the analysis of the previous Chapters, but they also draw on previous Competitiveness Reports and on the ongoing experiences and debates that Orkestra has with stakeholders both in the Basque Country and internationally. The chapter is structured in three sections, corresponding to the elements shown in Illustration 4.1: (1) the need to build future resilience from the resilience of the past; (2) the need to adapt in order to resist 'here and now'; and (3) the need to be at the forefront of transitions towards a new and better sustainable competitiveness.

4.1 Building future resilience from the resilience of the past

The Basque Country has good foundations on which to build resilience for the future

The analysis of the first chapter of this report shows that the Basque Country is, in general, has strong foundations from which to build the resilience of the future. In the last year for which data are available, most indicators improved, and the Basque Country was well positioned when compared with European regions (although less so regarding the group of comparable regions).

Even job creation, which has been a challenge since the highly negative impact of the 2008 crisis, was increasing, although not by as much as in other territories. The COVID-19 crisis, however, raises doubts about the territory's capacity to maintain this positive trend, especially bearing in mind that the analysis of job quality shows some grey areas, with a high percentage of temporary and part-time contracts. It is precisely these jobs, the most precarious ones, that are most susceptible to destruction. Regarding employment, then, the starting point is a somewhat dual situation, with part of the population employed with relatively stable jobs and another part who are either unemployed (especially the younger segment of the population) or who have precarious jobs (women, especially). The measures that are taken to promote resilience in the short, medium and long term should take this situation into account so that the crisis does not end up affecting especially the most vulnerable groups.

Measures that are adopted should consider the most vulnerable groups

In this sense, although the Basque Country is still among the European regions with the lowest rates of risk of poverty or social exclusion, it is worrying that both this indi-

cator and that of the ability to face unexpected financial expenses should have worsened over the last year. The inequality indicator also worsened, and analysis of the impact of the 2008 crisis shows that those in the lowest income strata were the ones whose purchasing power decreased the most. The measures that are taken must focus on preventing this situation from happening again in order to maintain the good results the Basque Country can show in terms of inequality and risk of poverty of exclusion.

The various elements analysed shed some light on the strengths and weaknesses of the Basque Country in terms of reinforcing resilience in the short, medium and long term. In the short term, it is worth noting the healthy economic and financial position Basque companies. Contrary to what happened in the previous crisis, this has allowed them to borrow to give themselves liquidity at times when their revenues have been significantly reduced. Their greater use of working capital financing, however, may become a threat as this is a type of financing that is more susceptible to being reduced in times of crisis.

In the medium and long term, several factors stand out. The first of these is the strong skills among the population. Although the high overqualification indicator may be interpreted negatively as it shows that a high percentage of the population do not occupy positions commensurate with their skills or qualifications, it also reveals that there is potential than can be exploited, if channeled correctly, to change, adapt and transform. These processes of transformation and renovation are more difficult without a skilled labour force that has an interest in further training in the future to adapt their skills to a changing work environment.

The high skills levels of the population should be focused on transformation and renovation

Another element to highlight is that the Basque Country has maintained a good track record in terms of personnel working in R&D. Expenditure on this, however, is far from the European average. Given the temptation to reduce expenditure, it is important to continue to give it priority in order to be able to react with the necessary innovations that will allow Basque firms to stay ahead of competitors and respond to the needs of the population. In this regard, collaboration with foreign agents can also be strengthened, while that between the scientific and industrial sectors should also continue to be increased, so that developments are better transferred to firms.

Regarding business innovation, the analysis shows that Basque firms are more innovative than the Spanish average. However, continuing to increase the percentage of innovative firms will be key to strengthening resilience in the medium and long term, especially in industry. Service firms most related to industry, despite being less innovative than industrial companies (probably related to the ways in which innovation is defined and measured), do show some characteristics that make them stand out relative to their German counterparts. This, therefore, is an element that can also be used to strengthen resilience.

Investment in R&D&I must be prioritized

Analysis of internationalization reveals that the export base has been increasing, with a growing number of firms venturing into international markets. Although this figure is positive, the challenge consists of consolidating and increasing the percentage of those that export regularly (which fell slightly last year), as well as increasing the average volume of turnover and gaining a more consolidated presence in the most dynamic markets. On the other hand, analysis of FDI shows that the Basque

Country is a territory with a high stock of investment abroad and with a higher percentage of shareholdings abroad than of foreign shareholders in local firms. In recent years, however, FDI inflows have gone down which, together with the low percentage of foreign shareholders especially in medium-sized and large firms, may limit the funds available for investment. Recovering capital inflows may be a challenge in the future.

The number of regular exporters must be increased, along with the average volume of turnover, and consolidation in more dynamic markets

The starting position regarding costs shows a situation that is quite favourable. Although unit labour costs for the economy overall are higher than those in Spain, they are below the European average. In manufacturing, the situation was somewhat less promising, but they are still below Germany and many of the comparable regions. It must be borne in mind, however, that the situation was different the previous year, when unit labour costs in manufacturing were higher than those in Germany. Thus, a challenge for medium- and long-term resilience is to continue to keep unit labour costs under control. The aim is for this to be achieved through increases in productivity, and not by reducing employment or at the cost of wages. Achieving this will depend on how the incorporation of the capabilities of the people in the territory is handled and how innovation and digitalization are managed.

Controlling unit labor costs through productivity increases is key

The capacity for resilience in the medium and long term will depend on how the digital and energy transitions are addressed. For the first of these, the good conditions already existing in terms of connectivity and digitalization of business stand out in a positive way, as does the progress being made in terms of public services being offered digitally. There is, however, progress still to be made in the use of these services and of economic transactions on the part of citizens in a world in which telematic interactions are ever-more important. There is also the challenge of bringing more women into the digital environment and in a better way.

Resilience will depend on how the digital and energy transitions are addressed

As for the energy transition, the positive progress made regarding the concentration of polluting particles and the diversification of fuel imports, as well as the good results regarding energy access and security, stand out as strengths. The main challenges are related to greenhouse gas emissions in key sectors such as transport and construction, the need to keep improving in energy intensity in the industrial sector and to reach a level of diversification of primary energy sources more oriented to the challenges of decarbonisation. Pushing the energy transition forward will be achieved by means of a combination of a greater role for renewable energies in the energy matrix, an increase in the degree of electrification of the economy and the progressive penetration of cleaner and more efficient technologies and fuels in the final uses, which itself will lead to improvements in energy efficiency and a reduction in the intensity of emissions.

4.2 Resisting and adapting 'here and now'

In the current context of uncertainty, agile responses are critical

The foundations of competitiveness laid down in the Basque Country over a period of several decades have established a solid platform for facing the current crisis, but it remains a severe socio-economic crisis that has no precedents in the last century and whose impacts reach all sectors. In addition, the need to live with the pandemic is something that is here to stay for the coming months (or years). In this context and recognizing the tremendous difficulties in taking good decisions in a

situation with such uncertainty, it is imperative to keep adapting business behaviour and policies in support of competitiveness in an agile way. If there is no agility in responses, there is the risk that other regions and the firms there, possibly less affected by the pandemic at certain moments, may get ahead and widen the recovery gap.

The agility to resist and adapt 'here and now' has different dimensions, from the capacity to react rapidly to that of reacting with precision. Particularly, the analysis carried out in Chapter 2 has shown the importance of considering the characteristics of different sectors and the factors the influence impacts and recovery. In addition, when it comes to establishing any public policy measure to counteract the effects of the health crisis, it is important to be aware of the potential impact that actions, or the lack thereof, may have on the rest of the sectors owing to the relationships between them.

Sector-specific intelligence is key to understand the impacts of the crisis

Sector-specific intelligence is therefore especially important and suggests the need to go deeper in detailed sectoral analysis by means of, for example, an observatory that will continually monitor the evolution of different sectors (which may be very different). This intelligence will serve to evaluate the effectiveness of recovery plans that are implemented and to know the status of each sector in the face of possible outbreaks or the need for epidemiological measures. For that to happen, it is of special relevance to make available the data that different Administrations already collect but that are not being exploited for this purpose. This is not, however, enough. In order that analysis of the secondary data collected is effective, this must be complemented by obtaining more immediate strategic intelligence. Indeed, the implementation of reactivation themselves measures will require regular dialogue with firms. This highlights the role of intermediaries such as Cluster Organizations (who are already developing individualized recovery roadmaps) and regional development agencies as critical allies for the government. It will also be important to coordinate the actions carried out at different levels of government, depending on the geographical distribution of the priority sectors and tailoring actions to the specifics of each territory in order to guarantee their needs are best covered.

Digital policies contribute to both short-term and long-term resilience

Regarding immediate responses from firms, in Chapter 3 it was noted that the accelerated adoption of different elements of digitalization —at the levels of product, process and channel— has been part of the response of many firms. As was shown in the analysis in Chapter 1, the digital transition in the Basque Country was already underway, but the COVID-19 crisis has altered its pace and the importance with which it is considered. From now, the question is whether this will continue with the same intensity and then stabilize (which means COVID-19 will represent a turning point or even one of no return) or if, on the other hand, there will be a backwards shift and a return to conventional models. It is, in any case, appropriate to design strategies that will consolidate the digital transformation of the economy while still evaluating the possible negative consequences (the digital divide in society, firms that are at digital risk). Digital policies are, in fact, particularly attractive because they contribute to strengthening resistance in the short term while helping firms prepare the ground for digital, green and demographic-social transitions in the medium-long term.

In terms of public policy, the severity and scale of the crisis caused by the pandemic has meant that from the outset national and supranational authorities have imple-

mented measures aimed above all at resisting, minimizing job losses and providing companies with liquidity, with the emphasis placed on SMEs. This is the framework for action established by the European Union and followed by countries such as Spain, Germany and Austria. During this phase, moreover, the European regions, within their different contexts and considering their policy competences and autonomy, have implemented specific measures complementary to those of the States. Thus, the Basque Country, Upper Austria and Baden-Württemberg —regions that share structural characteristics related to their productive specialisation— implemented measures aimed at supporting the liquidity of businesses (both in the form of credit lines and non-refundable grants) and measures aimed at supporting the digitalization of companies in a period when digital solutions and cyber-security were essential to continue their activity.

Observing policies in other places is an important source of learning

It is important that both the speed and precision of these political measures is maintained and made more sophisticated in the coming months of coexistence with the pandemic. Thus, an important part of the learning process will be to keep observing responses in other places. Furthermore, given the multilevel nature of the policies, multilevel governance is a key element in increasing the sophistication of the responses. In fact, rather than committing to a decentralised or centralised model to manage the crisis, the focus should be on joint decision-making, that is models of co-governance that are reciprocal and take into account the territory-specific context and complexity of the evolving crisis.

The combination of short-term and long-term measures is necessary

Lastly, although resisting 'here' and 'now' will continue to be critical over the coming months, the factors that have conditioned the short-term responses of territories also play a relevant role in terms of medium- and long-term resilience. In this sense, European and national policies establish a framework for a "green, digital and just" recovery in which regions must have room to put forward their own strategy. The large infusion of funds foreseen for recovery and resilience in the coming years within the framework of *Next Generation EU* represents a significant opportunity. However, it will be particularly important to steer them towards investments that are aimed at increasing productivity and facilitating industry transitions. Thus, in the short term, the challenge is to combine measures that are aimed at transformation with others that support strategic sectors whose recovery period is longer, provided they are aligned with a business renewal strategy.

4.3 Leading the transitions towards a new and sustainable competitiveness

Making the transition from a phase of resistance to one of recovery implies taking advantage of windows of opportunity that arise from all crises and that can lead to a modification of previous growth trajectories. From an evolutionary perspective of resilience, these opportunities imply reorienting the economy, which implies not going back to a previous state. Furthermore, it is clear that a return to the previous state is not possible, even if it were desirable, and the Basque Country should lead the search for a new model of competitiveness that is more sustainable and even more inclusive.

Throughout this report we have analyzed the position of the Basque Country before the socio-economic crisis brought on by COVID-19, the impact on the Basque econ-

omy and its sectors, and the most immediate responses from companies and public policies. Building long-term resilience, however, and finding that new model of sustainable competitiveness, requires all actors in the territory to align themselves in order to take advantage of the new opportunities offered by the recovery, specifically those of the green, digital and socio-demographic transitions.

In this sense, the Basque Country is not starting from scratch as it has, in recent decades, built a territorial strategy based on industry, technology and innovation, and on public-private collaboration, which has been expressed in recent years through the cluster policy and the smart specialisation strategy (RIS3 Euskadi).

The smart specialisation strategy has prioritized the fields of energy, bio-health, and advanced manufacturing since 2014, although they were areas in which there was already a certain trajectory and capabilities. These three areas, together with the four opportunity niches (food, ecosystems, creative and cultural industries, and urban habitat), bring together actors with capacities to move forward in the three transitions. Indeed, prior to the COVID-19 crisis, the strategic bases of the next Basque RIS3 (PCTI 2030) included a new approach to strategic priorities (Smart Industry, Clean Energies, Personalised Health) and opportunity niches (Healthy Food, Eco-innovation, Sustainable Cities, the Creative and Cultural industries), alongside the inclusion of transversal driving initiatives aligned with the three transitions (Healthy Aging, Electric Mobility, Circular Economy).

The smart specialization strategy is an asset for long term resilience

In this way, the Basque smart specialization strategy not only aligns itself with the major guidelines that lead the way out of the crisis to economic recovery, but it also responds to one of the aspects identified as an area for reinforcement, namely the orientation towards social challenges (Aranguren *et al*., 2019). It will be important to advance in this strategy through the practices of the established *Steering Groups*, evolving from a Smart Specialisation Strategy (S3) towards a Sustainable Smart Specialisation Strategy (S4) that will serve as a lever for the generation of common projects aimed at recovery and transitions.

In Chapter 1 of this report, the position of the Basque Country with respect to these major transitions is laid out. Regarding the digital transition, the Basque Country is well positioned in the DESI (Digital Economy and Society Index), above all regarding connectivity, the integration of technology by businesses and digital public services, and to a slightly lesser degree human capital. These strengths have allowed firms to adapt during the resistance phase of the crisis, and even make use of technologies to provide new solutions (see section 4.2). Digitalization, however, still does not translate effectively into new business models in the private sector or into an increase in demand for digital services from administrations on the part of citizens. For this to happen, it is not only important to incorporate technology, but also to improve capacities and competencies in firms and in society so that the digital transition becomes a lever for resilience in the medium and long term, as well as facilitating other transitions such as the green one (for example, the application of digital technologies in mobility). The Basque Country has assets for this, such as the BDIH, so leveraging these assets and exploiting their potential should be part of the future strategy.

Regarding the green transition, within which we can also include the energy transition, the European Environment Agency (EEA, 2019) cites three cites three major fun-

damental systems owing to their impact on the environment: the power system, the mobility system and the energy system. Actions that are taken *vis-à-vis* these systems, which are interrelated, will have a significant effect on greenhouse gas emissions. In this sense, the strengths of the Basque Country, mentioned in section 4.1, may be placed at the service of this transition. It is not enough to innovate more or to increase the number of innovative firms, but innovation for green transition must have a clear sense of direction and be accompanied by targeted public policies (internationalization, collaboration between science, technology and innovation actors and business, etc.).

The transitions should be approached as industrial opportunities

Although the two transitions are presented as transversal levers which will have a great transformational impact on sectors of the Basque economy, a position of industrial opportunity should also be taken up, so that these areas are reinforced and made competitive in the new context. This would imply addressing transitions not only from the point of view of demand, as is mostly the case to date, but also from the supply side so that, for example, not only are digital technologies integrated into firms in the Basque Country but capabilities to produce these technologies and their components are also developed. As was presented in section 4.1, the Basque country has, in this regard, strengths in innovation, internationalisation and qualification. Reinforcement and adaptation of regional policies in these areas would enhance the development of opportunities and resilience in the medium and long term. For this, it is appropriate to consider transitions not only as transversal to all policies, but to generate strategies for the transitions themselves that generate new business opportunities associated with value chains (such as building, food, industry 4.0, etc.) and build sustainable competitiveness into the future.

The pandemic has underlined the importance of the *foundational economy*

These two main transitions sit alongside a third socio-demographic transition in which the Basque Country also already has capacities, especially linked to the field of health. This pandemic has underlined the importance of the foundational economy (Barbera and Rees Jones, 2020), that is, of those activities that are essential for human well-being, among which can be highlighted health and food. In this sense, it is important to promote the development of these areas with policies that will bring in all the agents of the value chain, in such a way that not only is the well-being of Basque society guaranteed, but that new opportunities for the economic development of the region are uncovered.

Public-private partnership mechanisms, such as clusters, are more important than ever

All of this requires not only adopting a long-term innovation strategy, such as the RIS3, but leveraging mechanisms for public-private collaboration, such as cluster organisations, through which the weaknesses of the Basque productive fabric in terms of business size (Orkestra, 2018) may be compensated, and common recovery projects and transitions generated. This will mean breaking sectoral and cluster frontiers, moving towards inter-cluster initiatives, and making a more sophisticated use of the cluster organisations as levers for other policy areas that need strategic intelligence from industry and/or cooperation bridges between firms, scientific-technological agents and public administration.

In the same way, in these transitions the role of public administrations as a catalyst becomes especially relevant. By means of instruments such as investments, public procurement (innovative or pre-commercial) or the promotion of business collaboration platforms (such as the BIND —Basque Industry Accelerator Programme— or the

BDIH), among others, they can take on a driving role, leading to new solutions and innovations, the generation of new firms and businesses, and the development of infrastructures (digital, energy, technological) necessary to address the transitions. At the same time, they must take on the commitment to continue advancing as an agile and digital administration that is close to citizens.

The public administration can be a catalyst through innovative public procurement

In line with the conclusions of the previous Competitiveness Report (Orkestra, 2019), it is also necessary to act on skills so that the Basque Country has people with the necessary capacities to push these transitions forward, either by adapting training programmes or by attracting international talent. In the above-mentioned strategic and economic bases of the new PCTI 2030, in accordance with the European context and Horizon Europe programme, talent is considered a central element in the strategic pillars and a contribution to the achievement of objectives. Likewise, as was explained in section 4.1, the Basque Country is characterized by overqualification, which constitutes a strength if it is directed towards transitions and reorientation of the economy, and can also be leveraged for the future development of the Basque Science, Technology and Innovation System. In this context, it will be especially relevant to work on connections within the skills ecosystem and its agility and adaptability, a task in which again cluster organizations can play an important role[35].

Furthermore, the literature on transitions (Geels, 2002, Geels and Schot, 2010, among others) is clear that they must be adopted from a multilevel and multi-stakeholder perspective. The Basque Country has strengths among the science, technology and innovation system, the business fabric and the capacities of its people, but as has been shown during the health crisis, the way the capacities and governance are structured and coordinated will play a fundamental role in the recovery. It is thus not only necessary to articulate a model of governance in the Basque Country that is built on existing relational structures (RIS3, cluster policy, among others) to address recovery, but also to reinforce this with co-governance models between the different levels of administration in which territorial actors have a relevant role. In this sense, establishing a clearer definition of roles between the different administrations involved, to avoid duplication, would be beneficial.

Co-governance is a fundamental factor for recovery

Ultimately, the recovery involves reorienting the Basque economy by taking advantage of the opportunities that the three transitions offer and combining medium- and long-term measures with other short-term ones aimed at those firms and sectors that are facing the greatest difficulties in recovering. All without forgetting measures that will protect the most vulnerable groups, thus alleviating inequalities. In this sense, long-term resilience is a process in which different measures will need to be adapted and put into effect considering different contexts and timings. Thus, recovery from an evolutionary perspective implies constant change, which is a result of context and capacities, but also of the learning that is generated along the way.

In conclusion, the Basque Country went into the pandemic with certain strengths in its competitiveness upon which it was able to build its responses. The measures

[35] For analysis and examples of the role that clusters can play in skills ecosystems, see the recent discussion paper of the European Cluster Collaboration Platform (Wilson, 2020).

The key will be in combining measures that resist the pandemic with measures that support transition

adopted in the short term, at a time of great uncertainty and difficulty, have been rapid, flexible and similar to those applied in other reference regions. The uncertainty brought on by the pandemic, however, continues for now and the key in the following months will be to combine resistance measures with a vision of investing in the transitions that will ensure the resilience of the Basque Country in the future.

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Appendices

Appendix 1
Values for competitiveness indicators

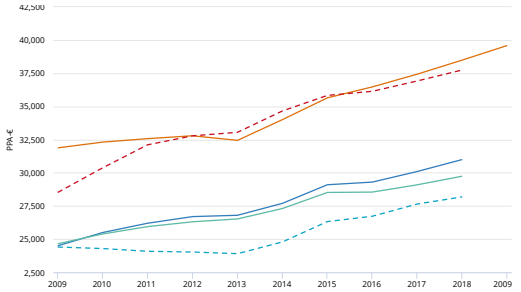
	Indicator	Most recent						1 year before					
		Year	Basque Country	EU-28	Comparable reg.	Spain	Germany	Year	Basque Country	EU-28	Comparable reg.	Spain	Germany
Outcomes	GDP per capita (PPP)	2019	39.591	32.020	—	28.850	38.520	2018	38.493	31.000	29.745	28.187	37.749
	Household disposable income per capita (PPP)	2017	20.400	16.773	17.691	15.739	21.466	2016	19.900	16.535	17.578	15.487	21.024
	Long-term unemployment (% lab. force)	2019	3,7	2,5	2,0	5,3	1,2	2018	4,7	3,0	2,4	6,4	1,4
	NEET rate (% pop. aged 15–24)	2019	8,1	10,1	10,4	12,2	5,7	2018	9,4	10,5	10,1	12,6	5,9
	Population at risk of poverty or social exclusion (% total pop.)	2019	14,4	21,4	19,2	25,3	17,4	2018	12,1	21,7	18,9	26,1	18,7
Intermediate performance	Employment rate (% pop. aged 15-64)	2019	67,4	69,2	71,0	63,3	76,7	2018	67,1	68,5	70,4	62,4	75,9
	Female employment rate (% pop. aged 15–64)	2019	63,8	64,0	67,2	57,9	72,8	2018	63,4	63,3	66,4	56,8	72,1
	Unemployment rate (% lab. force ≥ 15 y.o.)	2019	9,8	6,3	6,2	14,1	3,2	2018	10,5	6,8	6,6	15,3	3,4
	Youth unemployment rate (% lab. force aged 15-24)	2019	20,8	14,4	14,6	32,3	5,8	2018	20,2	15,2	15,3	34,1	6,3
	Relative net migration (% total pop.)	2018	0,58	0,28	0,41	0,71	0,48	2017	0,37	0,23	0,28	0,35	0,51
	Apparent productivity per employee (thousands, PPP)	2019	91,3	68,1	—	67,4	70,8	2018	89,7	66,5	66,3	66,9	69,8
	PCT patents per million inhabitants	2017	208,2	406,5	403,7	150,3	884,8	2016	215,4	408,6	410,7	153,5	874,9
	Publications (WoS) per million inhabitants	2019	2.714	2.222	2.812	2.655	2.564	2018	2.513	2.196	2.740	2.496	2.548
	Publications in Q1 (% publications)	2019	58,0	52,8	56,3	56,6	53,2	2018	60,4	53,7	58,1	57,3	54,1

	Indicator	Most recent						1 year before					
		Year	Basque Country	EU-28	Comparable reg.	Spain	Germany	Year	Basque Country	EU-28	Comparable reg.	Spain	Germany
Determinants of competitiveness: Firm performance	Firm R&D personnel (% employment)	2018	1,46	0,86	0,9	0,54	1,08	2017	1,43	0,81	0,89	0,51	1,05
	Firm R&D expenditure (% GDP)	2018	1,41	1,41	1,4	0,70	2,16	2017	1,39	1,37	1,42	0,66	2,12
	PCT patent co-invention (4-year window) (% patents)	2017	69,0	70,8	68,6	67,9	72,1	2016	65,7	70,4	67,6	66,4	72,1
	PCT patents with foreign collaboration (4 year window) (% patents)	2017	7,6	11,0	11,4	11,5	9,1	2016	7,1	11,0	11,3	10,6	9,4
Determinants of competitiveness: Specialisation	Employment in high- and medium-high-tech manufacturing (% employment)	2019	8,7	5,8	5,6	4,0	10,0	2018	8,5	5,8	5,6	4,0	9,9
	Employment in knowledge-intensive services (% employment)	2019	38,4	40,7	43,3	36,1	41,1	2018	37,5	40,3	42,7	35,8	40,7
Determinants of competitiveness: Business environment	Human resources employed in science and technology (% total pop.)	2019	19,1	22,1	22,5	16,6	28,1	2018	19,1	21,6	21,9	16,0	27,2
	Population aged 25-64 with upper secondary or tertiary education (% pop. aged 25-64)	2019	72,1	78,7	76,3	61,3	86,6	2018	71,8	78,1	75,5	60,1	86,6
	Tertiary education students (% pop. aged 20-24)	2018	47,4	33,1	32,4	43,0	29,6	2017	47,1	30,5	31,7	42,1	29,1
	Overqualification index (%)	2019	1,53	0,85	0,94	1,30	0,66	2018	1,51	0,84	0,94	1,30	0,66
	Vocational education and training students (% pop. aged 15-19)	2018	57,4	42,7	50,9	46,2	45,2	2017	57,5	49,6	52,8	45,6	44,2
	Population enrolled in continuing education (% pop. aged 25-64)	2019	13,0	11,3	14,0	10,6	8,2	2018	12,7	11,1	13,7	10,5	8,2
	Public R&D personnel (% employment)	2018	0,60	0,60	0,56	0,62	0,58	2017	0,59	0,59	0,56	0,64	0,57
	Public R&D expenditure (% GDP)	2018	0,45	0,69	0,62	0,54	0,97	2017	0,46	0,69	0,62	0,54	0,94
	Total R&D personnel (% employment)	2018	2,06	1,48	1,50	1,17	1,67	2017	2,02	1,41	1,45	1,15	1,62
	Total R&D expenditure (% of GDP)	2018	1,85	2,11	2,07	1,24	3,13	2017	1,85	2,08	2,04	1,21	3,06
	Publications with international cooperation (% publications)	2019	53,7	56,5	55,4	50,6	54,6	2018	53,9	54,7	54,4	50,2	53,1
	Publications with industry cooperation (% publications)	2019	1,93	4,00	4,43	3,43	5,36	2018	1,65	4,15	4,57	3,52	5,47
	Households with broadband access (% households)	2019	91,0	88,4	89,6	91,1	93,7	2018	90,0	85,8	87,9	86,1	90,3
	Individuals that make online purchases (total pop.)	2019	55,0	63,3	73,3	57,6	79,4	2018	52,0	59,9	70,4	53,0	76,7

Appendix 2
Evolution of competitiveness indicators

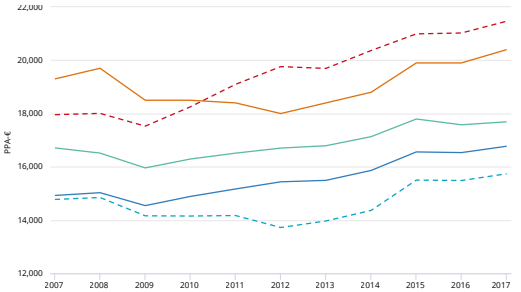
Final outcome

GDP per capita (PPP)



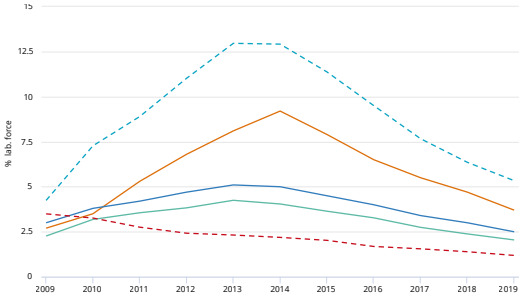
Source: Eurostat+EUSTAT. Compiled by Orkestra.

Household disposable income per capita (PPP)



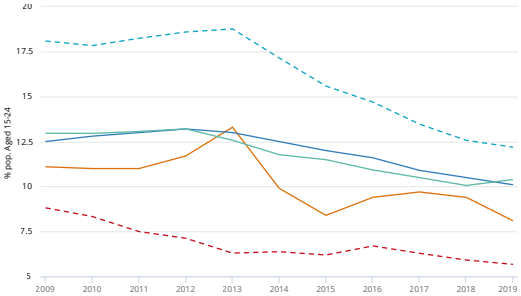
Source: Eurostat. Compiled by Orkestra.

Long-term unemployment (% lab. force)



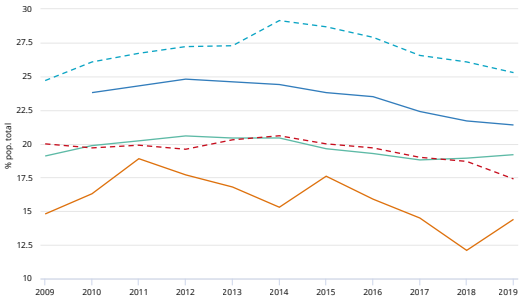
Source: Eurostat. Compiled by Orkestra.

NEET rate (% pop. Aged 15-24)



Source: Eurostat+EUSTAT. Compiled by Orkestra.

Population at risk of poverty or exclusion



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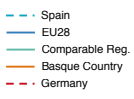
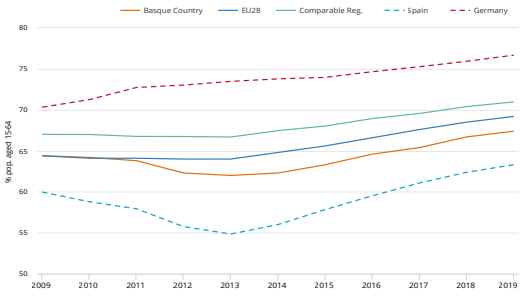


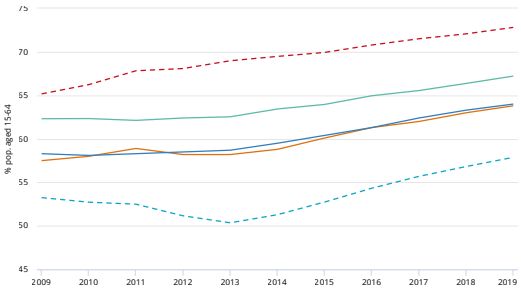
Intermediate performance

Employment rate (% pop. aged 15-64)



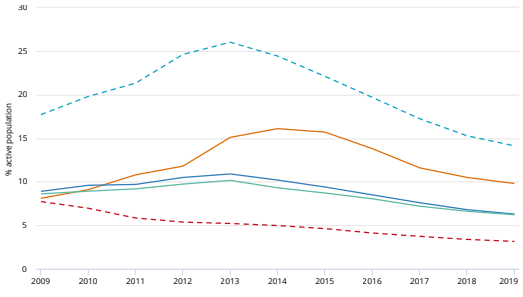
Source: Eurostat+EUSTAT. Compiled by Orkestra.

Female employment rate (% pop. aged 15-64)



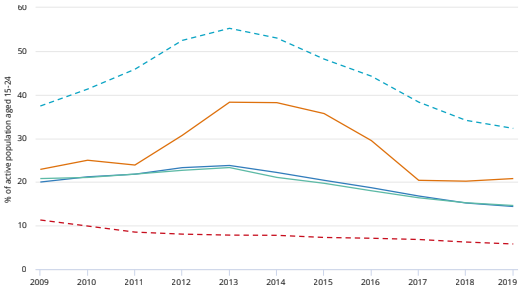
Source: Eurostat+EUSTAT. Compiled by Orkestra.

Unemployment rate (% of active population aged >15)



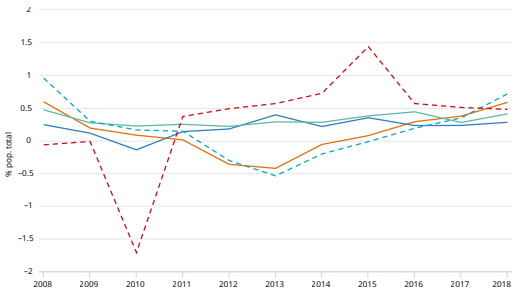
Source: Eurostat+EUSTAT. Compiled by Orkestra.

Youth unemployment rate (% of population aged 15-24)



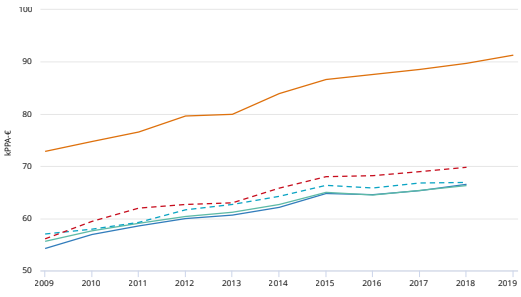
Source: Eurostat+EUSTAT. Compiled by Orkestra.

Relative migratory balance



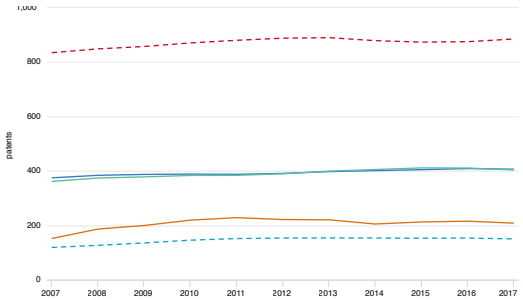
Source: Eurostat. Compiled by Orkestra.

Apparent productivity per worker (APW)

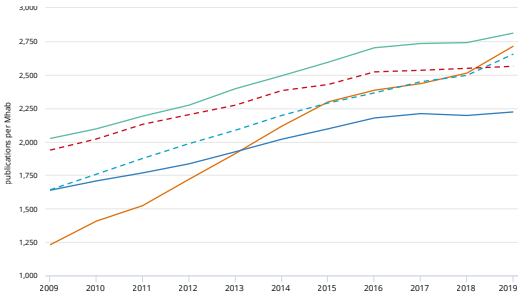


Source: Eurostat+EUSTAT. Compiled by Orkestra.

PCT patents per million inhabitants (patents)

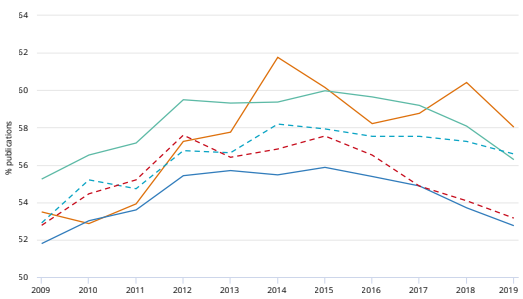


Publications (WoS) per million inhabitants (publications)



Source: Incites. Compiled by Orkestra.

Publications in Q1 (%)



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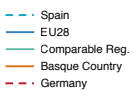
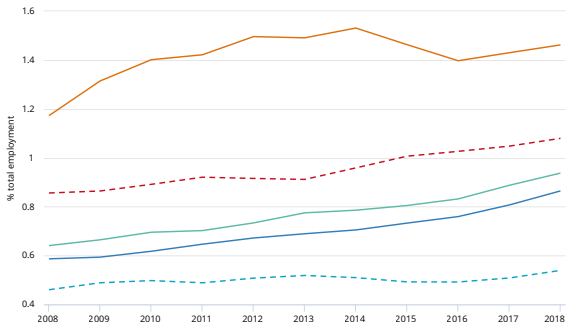


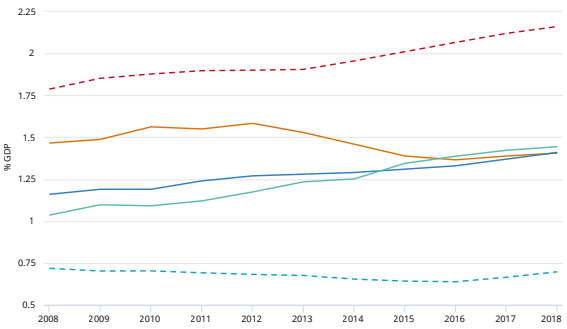
Determinants of competitiveness: Firm performance

R&D personnel of firms (% employment)



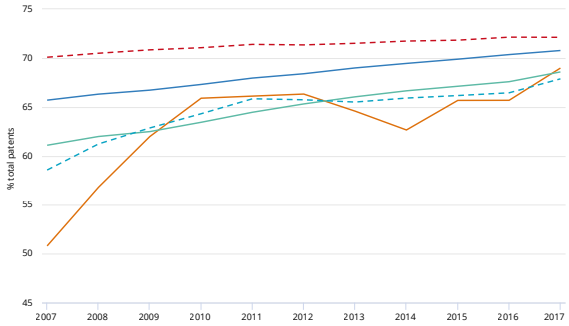
Source: Eurostat+EUSTAT. Compiled by Orkestra.

R&D expenditure of firms (% GDP)

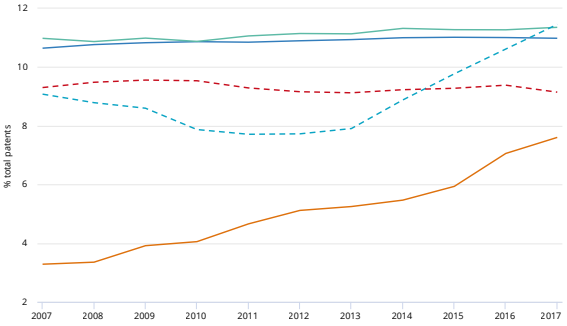


Source: Eurostat+EUSTAT. Compiled by Orkestra.

PCT patent co-invention (4-year window) (% patents) (% patents)

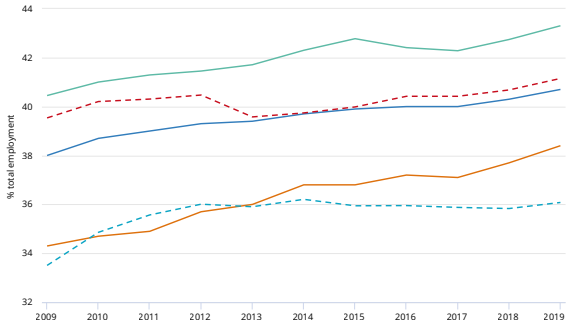


PCT patent with foreign collaboration (4-year window) (% patents)



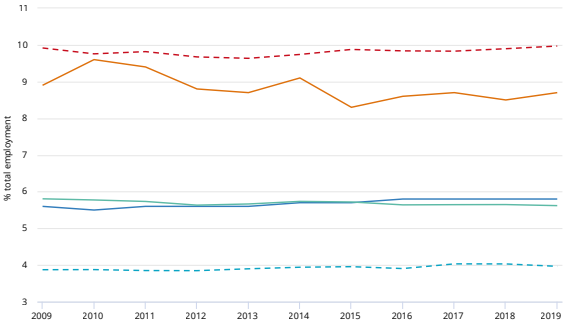
Determinants of competitiveness: Specialisation

Employment in high-tech manufacturing and medium-high (% employment)



Source: Eurostat+EUSTAT. Compiled by Orkestra.

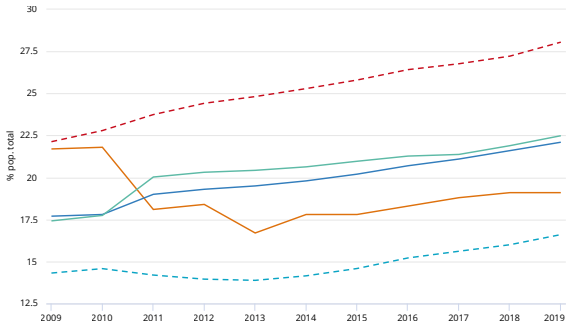
Employment in knowledge-intensive services (% employment)



Source: Eurostat+EUSTAT. Compiled by Orkestra.

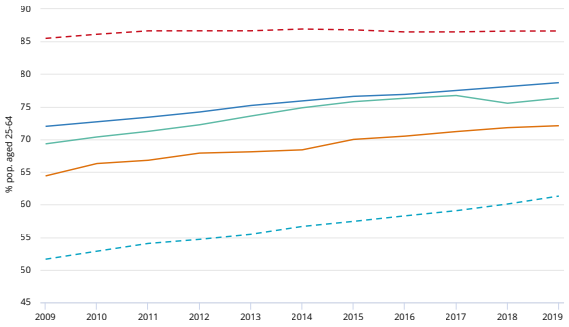
Determinants of competitiveness: Business environment

Human resources in science and technology (%)



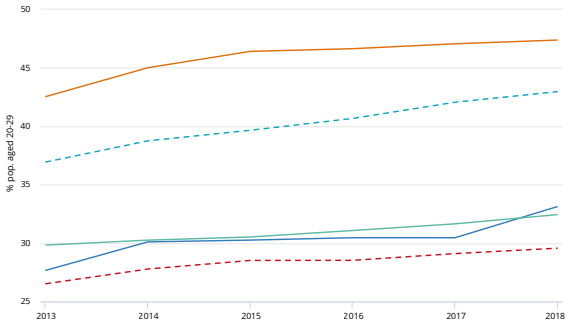
Source: Eurostat+EUSTAT. Compiled by Orkestra.

Population aged 25-64 with secondary education upper or tertiary (%)



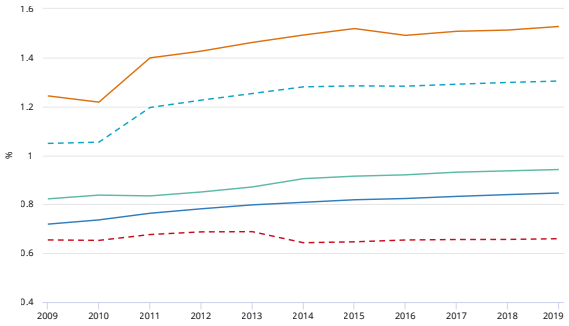
Source: Eurostat. Compiled by Orkestra.

Students enrolled in tertiary education (% pop. aged 20-29)



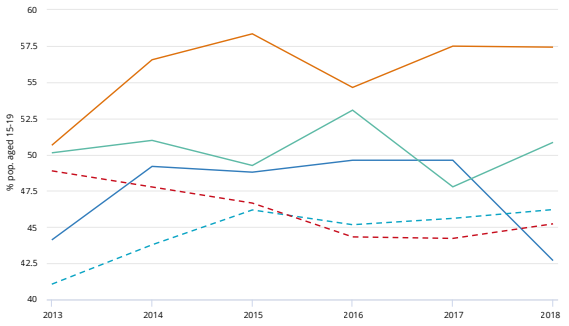
Source: Eurostat+EUSTAT. Compiled by Orkestra.

Overqualification index (% pop. 25-64)



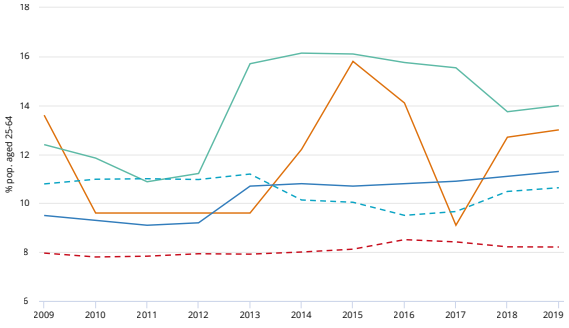
Source: Eurostat. Compiled by Orkestra.

Students enrolled in vocational education and training (% pop. aged 15-19)



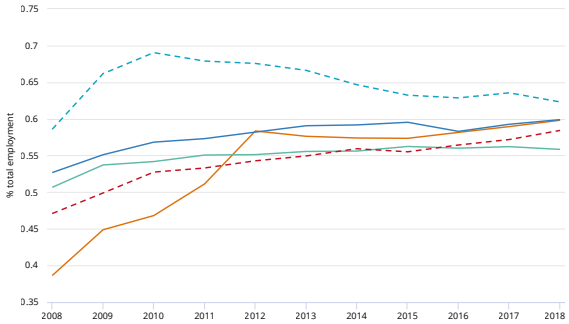
Source: Eurostat+EUSTAT. Compiled by Orkestra.

Population engaged in continuing education (% pop. 25-64)



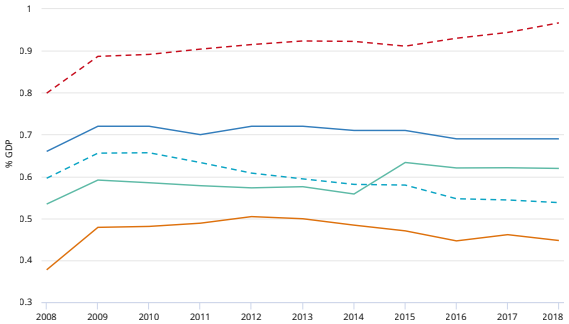
Source: Eurostat+EUSTAT. Compiled by Orkestra.

FTE personnel engaged in R&D, public (% total employment)



Source: Eurostat+EUSTAT. Compiled by Orkestra.

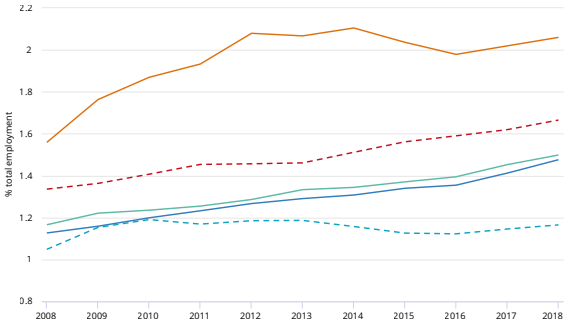
Internal R&D expenditure, public (% GDP)



Source: Eurostat+EUSTAT. Compiled by Orkestra.

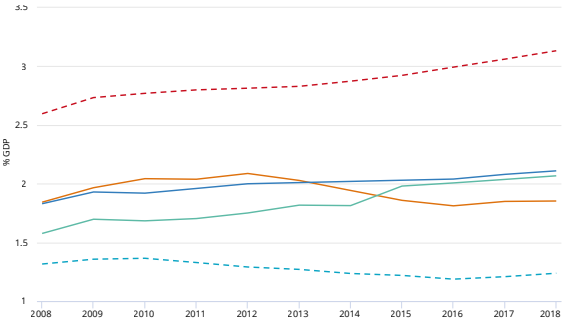
Basque Country · EU28 · Comparable Reg. · Spain · Germany

FTE personnel engaged in R&D, total (% total employment)



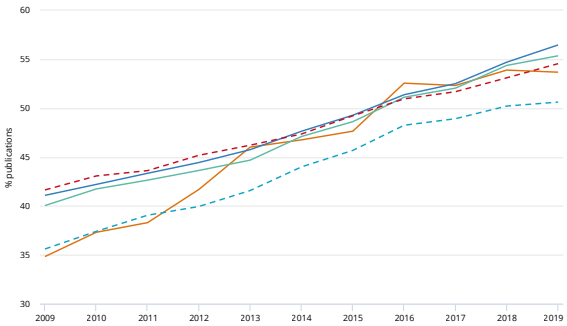
Source: Eurostat+EUSTAT. Compiled by Orkestra.

Total internal R&D expenditure (% PIB)



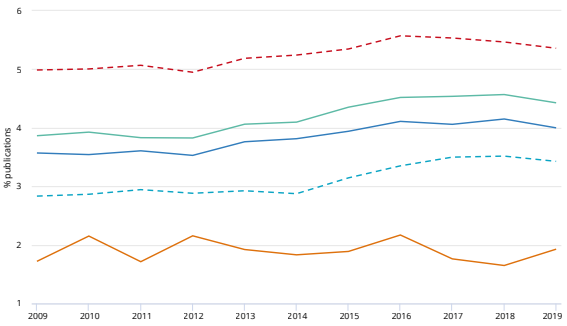
Source: Eurostat+EUSTAT. Compiled by Orkestra.

Publications with international cooperation (% publications)



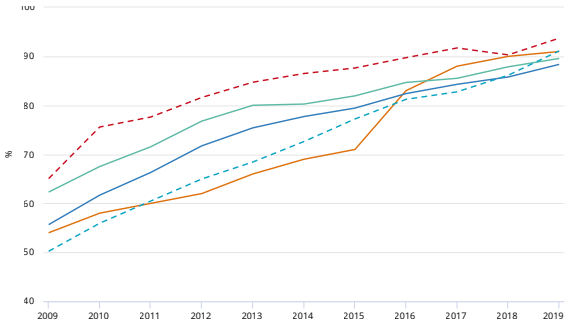
Source: Incites. Compiled by Orkestra.

Publications with industry cooperation (% publications)



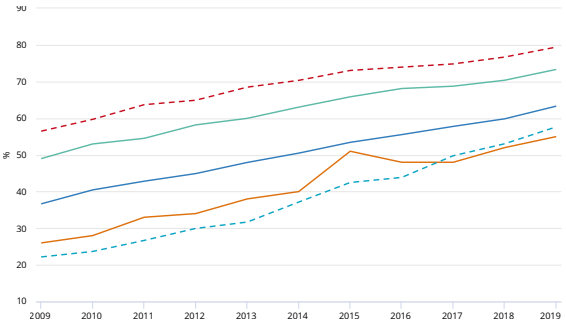
Source: Incites. Compiled by Orkestra.

Households with broadband access (%)



Source: Eurostat+EUSTAT. Compiled by Orkestra.

Individuals who make online purchases (%)



Source: Eurostat+EUSTAT. Compiled by Orkestra.

Appendix 3 Ranking of the Basque Country in competitiveness indicators

	Indicator	Year	Ranking in comparison with ...			Difference in ranking, compared to the previous year, for...		
			...all European regions	...comparable regions	...Spanish aut. comm.	...all European regions	...comparable regions	...Spanish aut. comm.
			Most recent	Most recent	Most recent	Δ	Δ	Δ
Outcomes	GDP per capita (PPP)	2018	29	4	1	2	0	1
	Household disposable income per capita (PPP)	2017	25	6	1	0	0	0
	Long-term unemployment (% lab. force)	2019	162	29	6	4	1	–1
	NEET rate (% pop. aged 15–24)	2019	78	9	1	22	5	5
	Population at risk of poverty or social exclusion (% total pop.)	2019	26	3	2	–16	–1	–1
Intermediate performance	Employment rate (% pop. aged 15–64)	2019	131	27	7	–6	–1	–1
	Female employment rate (% pop. aged 15–64)	2019	119	26	4	–5	0	0
	Unemployment rate (% lab. force ≥ 15 y.o.)	2019	164	28	2	2	0	1
	Youth unemployment rate (% lab. force aged 15–24)	2019	147	26	1	–10	–2	0
	Relative net migration (% total pop.)	2018	40	9	9	31	6	–3
	Apparent productivity per employee (thousands, PPP)	2018	7	2	1	–1	0	0
	PCT patents per million inhabitants	2017	96	30	4	–2	–2	–1
	Publications (WoS) per million inhabitants	2019	72	20	7	7	1	0
	Publications in Q1 (% publications)	2019	26	6	5	–12	–2	–1

	Indicator	Year	Ranking in comparison with ...			Difference in ranking, compared to the previous year, for...		
			...all European regions	...comparable regions	...Spanish aut. comm.	...all European regions	...comparable regions	...Spanish aut. comm.
			Most recent	Most recent	Most recent	Δ	Δ	Δ
Determinants of competitiveness: Firm performance	Firm R&D personnel (% employment)	2018	14	4	1	–1	0	0
	Firm R&D expenditure (% GDP)	2018	44	14	1	–4	–2	0
	PCT patent co-invention (4-year window) (% patents)	2017	79	18	5	25	3	2
	PCT patents with foreign collaboration (4-year window) (% patents)	2017	164	25	11	10	4	–1
Determinants of competitiveness: Specialisation	Employment in high- and medium-high-tech manufacturing (% employment)	2019	31	4	2	2	0	0
	Employment in knowledge-intensive services (% employment)	2019	113	25	4	–1	0	0
Determinants of competitiveness: Business environment	Human resources employed in science and technology (% total pop.)	2019	112	28	3	–2	–1	–1
	Population aged 25–64 with upper secondary or tertiary education (% pop. aged 25–64)	2019	156	27	2	–3	0	0
	Tertiary education students (% pop. aged 20-24)	2018	23	3	5	–1	0	0
	Overqualification index (%)	2019	215	31	18	–1	0	0
	Vocational education and training students (% pop. aged 15-19)	2018	48	8	4	–3	1	–1
	Population enrolled in continuing education (% pop. aged 25–64)	2019	71	26	1	3	0	1
	Public R&D personnel (% employment)	2018	69	13	5	3	0	0
	Public R&D expenditure (% GDP)	2018	113	19	11	–6	0	–2
	Total R&D personnel (% employment)	2018	22	4	1	–3	0	0
	Total R&D expenditure (% of GDP)	2018	57	12	1	–2	0	0
	Publications with international cooperation (% publications)	2019	97	22	3	–23	–4	0
	Publications with industry cooperation (% publications)	2019	163	30	11	–3	0	–1
	Households with broadband access (% households)	2019	64	20	7	–13	–6	–3
	Individuals that make online purchases (total pop.)	2019	159	31	17	1	0	0

Appendix 4
Methodological notes on the 2018 Oslo Manual

The different surveys consulted to obtain the innovation data presented are based on the concepts defined in the most recent publication of the Oslo Manual (OM), an international standard prepared by the OECD and Eurostat to facilitate the collection and interpretation of data from measurement of innovation, as well as its comparability at an international level.

The first edition of the manual dates from 1992 and, since then, it has been revised three times in order to adapt as innovation evolves in the business field. The fourth and most recent edition, published in 2018, includes several methodological changes that have an impact on the monitoring of most indicators, causing a break in their time series. In general, these changes may be summarised in that the four types of innovation included in the third edition of the OM (product, process, organization and marketing), are reduced to two in the latest edition (product and business process). The different components of the two eliminated categories have been redistributed among the remaining ones. There are also some existing components that are considered in a more specific way and others that are included for the first time.

With each new version, the OM seeks to update and adapt its definitions and taxonomies to try to represent a vision of innovation as closely as possible to the reality of a given period. In the case of the fourth edition, the manual cites four global trends that mark the current stage: the dominant role of global value chains, the emergence of new information technologies and how they influence new business models, the growing importance of knowledge-based capital as well as progress made in understanding innovation and its economic impact. Based on these phenomena, many of the changes included in this edition of the manual are directly related to the influence of digital transformation on innovation processes.

With all this, the two types of innovation defined by the 2018 MO are, on the one hand, those that change the company's products (product innovations) and, on the other, those that change the company's business processes (business process innovations). The other two categories that previously existed (organizational and marketing innovation) become, with some modifications, two subcategories of business process innovations.

In the case of organisational innovation, the reason for its removal as a generic category is because experience has shown that it can sometimes be difficult to differenti-

ate between organisational and process innovations. In this way, in the 2018 edition they are considered as a type of business process innovations, under a new name (administration and management).

In terms of marketing innovation, which adds, in the new version, the sales and post-sales support functions not included previously, it also becomes a sub-category of business process innovations. In addition, there is another important change: product design innovations are no longer part of marketing innovations but are just another component of product innovations. This change is justified by the idea that there is a very close relationship between design activities and the development of a product's characteristics.

On the other hand, in the previous edition, within the category of process innovation, there was a subcategory (auxiliary services) that included, among others, information and communication technologies. For them, a new subcategory is created within the business process innovations, while the rest of services (purchasing, accounting, etc.) are included in the administration and management section

Finally, there is a new subcategory: business product process development.

The table below shows the subcategories of each of the types of innovation, indicating in different colors those that have undergone some modification with respect to the previous version of the OM.

Product innovation	Goods
	Services
	Design
Business process innovation	Production
	Distribution and logistics
	Information and Communications Technology
	Management and administration
	Marketing and sales and post-sales support
	Development of product and business processes

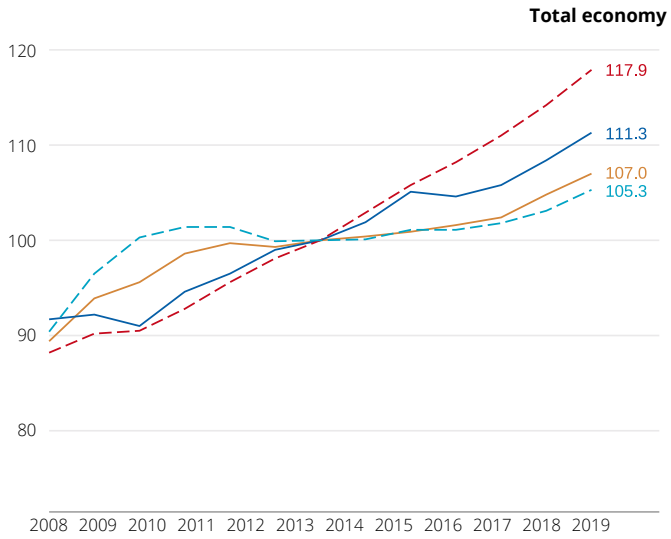
Source: Oslo Manual, 2018.

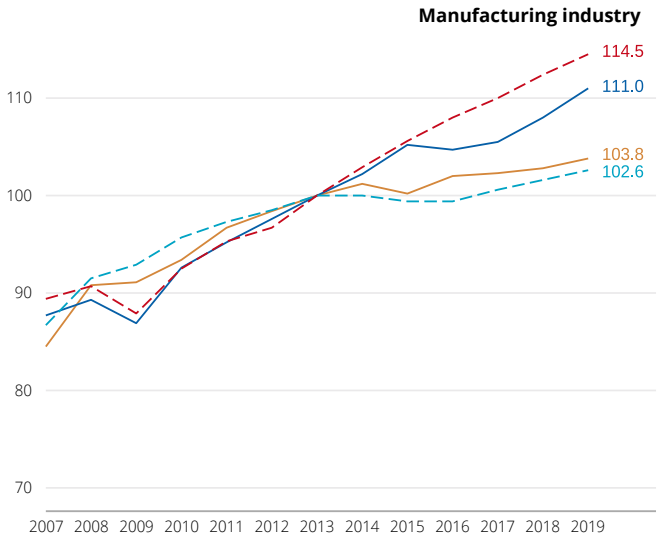
Appendix 5
Profile of basque exporters compared to spanish

		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Indicators linked to the number of exporters	No. of exporters	6,837	7,171	7,162	7,479	11,399	13,180	13,547	13,923	14,461	14,831	16,145	15,900	17,009
	% of/	7.0	7.1	6.7	6.8	9.3	9.6	9.0	9.4	9.8	10.0	10.0	7.8	8.1
	% total firms with paid employees		8.5	8.7	9.3	14.7	17.3	17.6	18.6	19.6	19.5	22.3	21.4	23.8
	% of firms with over €50,000 in exports	40.6	40.4	37.3	37.9	25.3	23.3	22.8	22.6	21.0	20.7	19.5	18.9	18.3
	% of Spanish firms with over €50,000 in exports	7.8	8.2	7.9	8.1	8.0	8.1	7.9	8.0	7.9	8.0	8.2	7.9	8.0
	% of regular exporters, Basque Country	37.5	35.6	38.2	36.4	23.0	20.4	21.7	31.6	32.2	32.8	30.8	31.9	30.7
	% of regular exporters, Spain	40.2	39.1	36.5	35.4	30.3	27.9	27.2	31.0	32.4	33.5	31.3	25.4	25.3
Indicators linked to export value	Value of exports, Basque Country (million €)	19,072	20,279	14,942	17,875	20,487	20,971	20,631	22,501	21,866	21,615	24,109	25,773	25,389
	% s/valor de exportación de España	10.3	10.7	9.3	9.6	9.5	9.3	8.7	9.4	8.8	8.4	8.7	9.0	8.8
	Average value of exports per firm, Basque Country (thousand €)	2,790	2,828	2,086	2,390	1,797	1,591	1,523	1,616	1,512	1,457	1,493	1,621	1,493
	Average value of exports per firm, Spain (thousand €)	1,899	1,866	1,486	1,708	1,748	1,644	1,560	1,627	1,695	1,725	1,711	1,398	1,387
	% of exports, firms with over €50,000 in exports	99.8	99.8	99.7	99.7	99.8	99.8	99.8	99.8	99.8	99.8	99.8	99.8	99.8
	% of exports, 5 largest, Basque Country	23	23	22	21	23	23	21	24	23	25	26	27	26
	% of exports, 25 largest, Basque Country	43	42	39	43	43	43	41	44	43	44	45	46	45
	% of exports, 100 largest, Basque Country	64	64	63	64	64	64	63	65	64	64	65	65	64
	% of exports, 1000 largest, Basque Country	97	96	96	96	96	96	96	96	96	96	96	97	96
	% of exports, 5 largest, Spain	11	10	11	10	9	10	10	10	10	11	10	10	10
	% of exports, 25 largest, Spain	25	24	23	23	23	24	25	25	25	25	24	24	24
	% of exports, 100 largest, Spain	39	37	37	38	40	40	41	41	40	40	40	40	39
	% of exports, 1000 largest, Spain	66	66	66	67	68	68	68	68	67	67	67	67	67
	% of export value, regular exporters, Basque Country	92	92	93	91	93	92	93	91	93	94	96	95	94
	% of export value, regular exporters, Spain	90	90	92	91	91	91	92	93	93	94	95	95	95

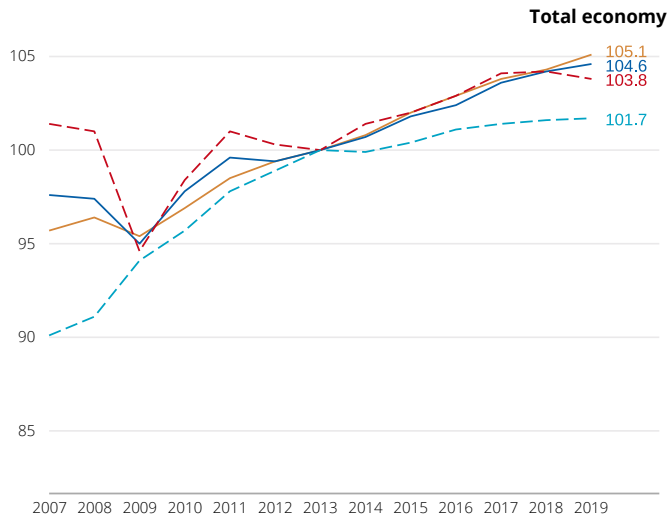
Appendix 6
Trends in labour costs and productivity

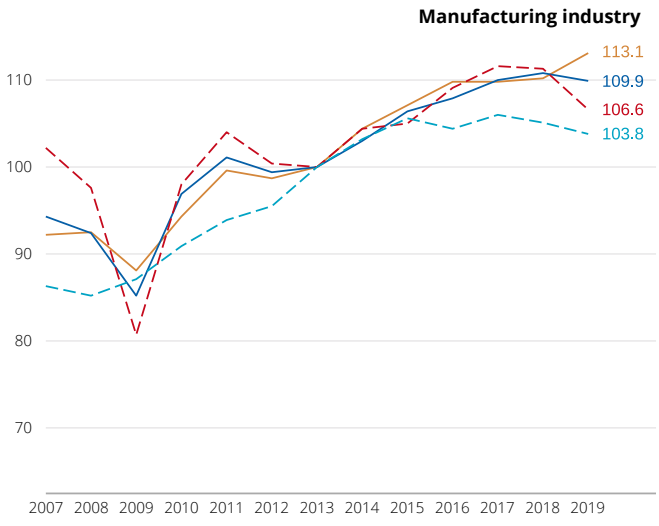
Nominal labour cost per employee



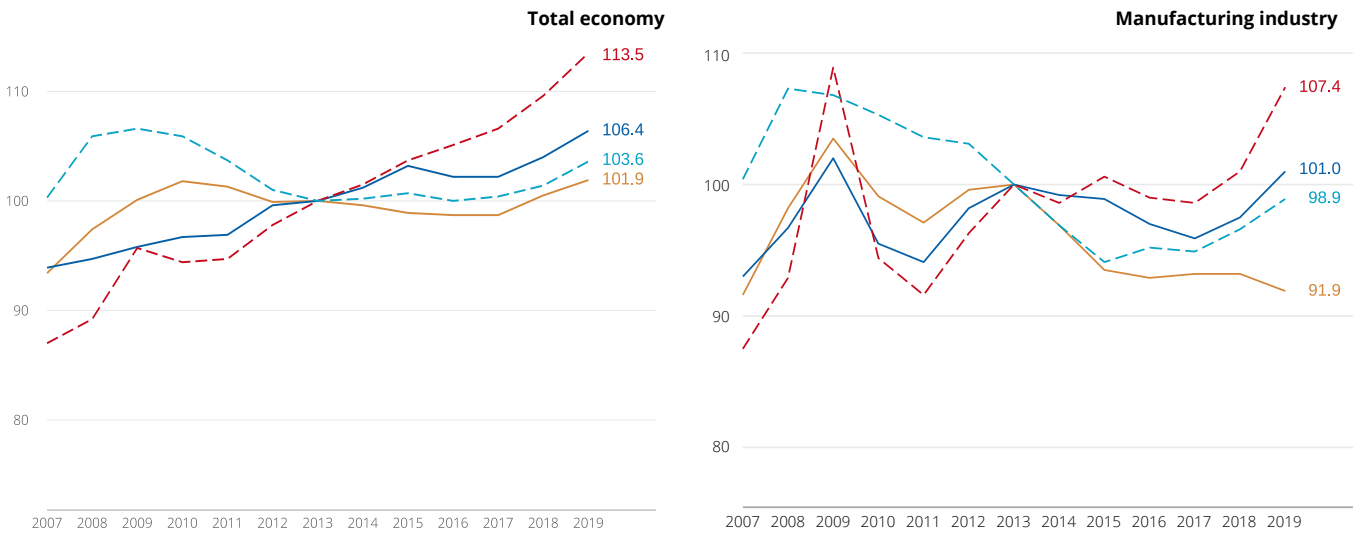


Productivity

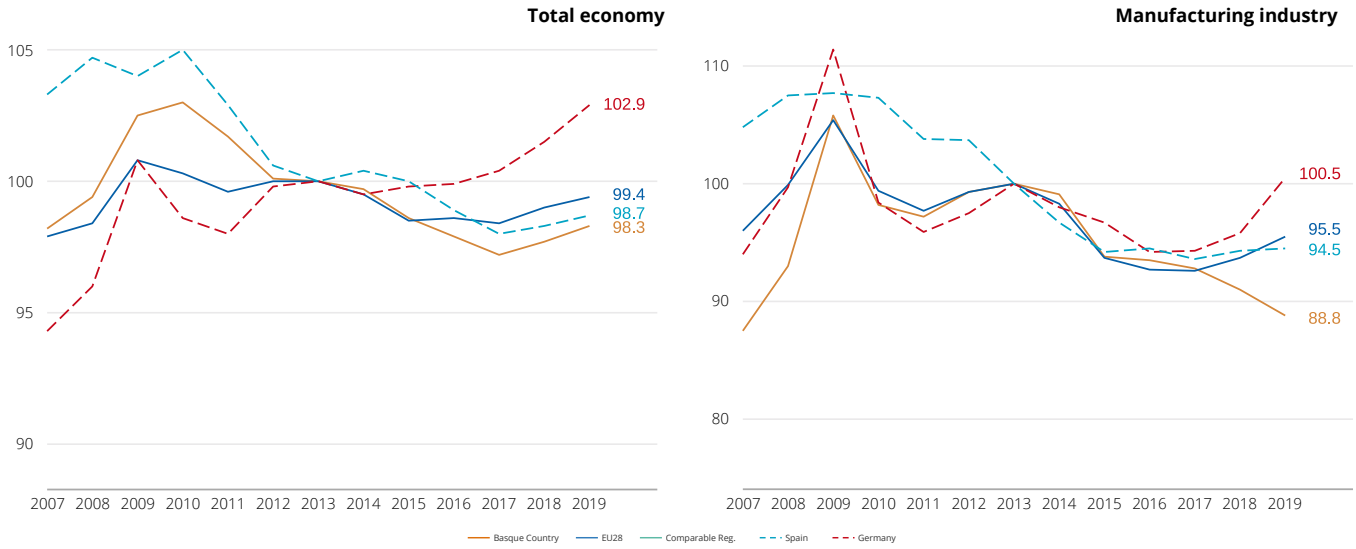




Nominal unit labour cost



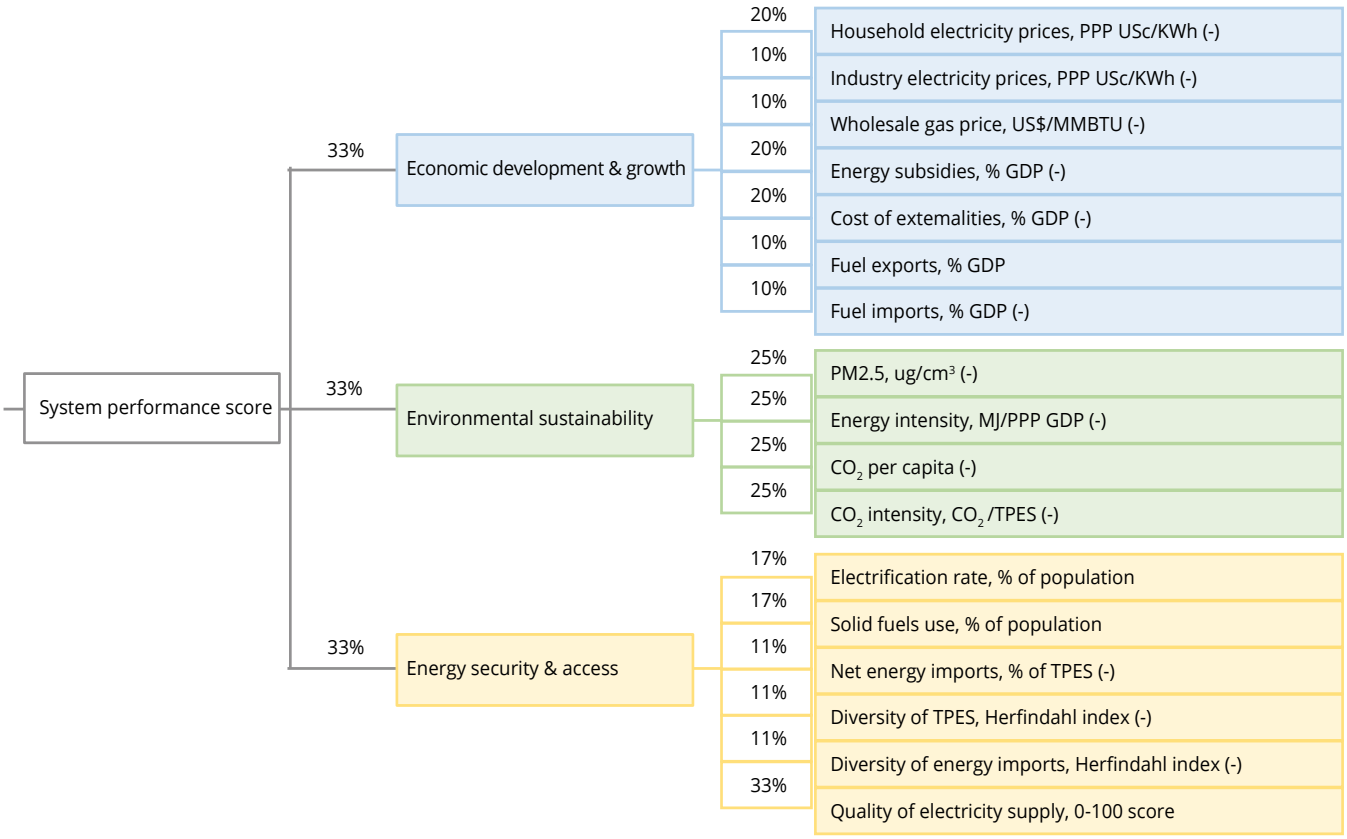
Real Unit Labour Cost



Source: Eustat (Basque Statistics Office) and Eurostat. Compiled by authors.

Appendix 7
Energy transitions index

Structure of the energy transitions index



Source: World Economic Forum (2019).

Adapting the ETI calculation by the World Economic Forum to the regional level presents some methodological difficulties, in addition to the limited availability of information. As a consequence, the methodology used has been the following:

1. Reproduce the System Performance sub-index for the EU28 countries using the latest available data published for the ETI 2020 (World Economic Forum, 2020), with some simplifications in the calculation methodology;

2. Reproduce the System Performance sub-index for the Basque Country using data corresponding to 2018 published by Eustat, EVE, INE, the Basque Government and other sources. The reference year for the EU28 is the most recent one used by the ETI 2020 sources (which is why it varies for the different indicators) and in the case of the Basque Country, data has been available for all the variables for 2018.
3. Where there is no information for the Basque Country, since only 9 of the 17 indicators of the System Performance sub-index can be estimated with their own information for the BAC, or it makes no sense to differentiate it from that of Spain, use the value proposed by the WEF for Spain. For example, energy prices, although they differ at the regional level, tend to be lower than those between countries.

Data source for the World Economic Forum and those employed for the Basque Country

Component	WEF Source	Basque Country source
Economic Growth and Development		
Domestic electricity price	Enerdata	Value for Spain
Industrial electricity price	World Bank	Value for Spain
Wholesale gas price	International Gas Union	Value for Spain
Subsidies on fossil fuels	International Monetary Fund	Value for Spain
Subsidy on the cost of externalities	International Monetary Fund	Value for Spain
Fossil fuel exports	World Trade Organization	Eustat
Fossil fuel imports	World Trade Organization	Eustat
Environmental sustainability		
PM concentration 2.5	World Bank	Basque Government, Government of Spain
Energy intensity	International Energy Agency, World Bank	EVE, Eustat investing.com
CO_2 per capita	International Energy Agency	Ihobe, Eustat
CO_2 per primary energy	International Energy Agency	Ihobe, EVE
Energy access and security		
Electrification ratio	World Bank	Value for Spain
Access to clean cooking fuels	World Health Organization	Value for Spain
Imported energy	International Energy Agency	EVE
I. Diversification of fossil fuel imports	United Nations Conference on Trade and Development	Eustat
I. Diversification of primary energy	International Energy Agency	EVE
Quality of electricity supply	World Bank	Value for Spain

Appendix 8
Characteristics of firms by 38 sectors

Sector A38	Sector A38 Code	Employment	% of total employment	Medium-sized (employment)	GVA (% of total)	Variation in share of GVA (p.p.) 2018 vs. 2008	% firms with foreign capital
Agriculture, livestock and fishing	AA	17,224	2.0	2	1.0	0.3%	0.0
Extractive Industries	BB	443	0.1	16	0.1	–0.2%	12.8
Food, beverages and tobacco	CA	15,255	1.7	15	1.5	–0.1%	4.5
Textiles, apparel, leather and footwear	CB	2,566	0.3	4	0.2	–0.1%	1.0
Wood, paper and printing	CC	11,725	1.3	8	1.1	–0.4%	2.2
Manufacture of coke and refined petroleum products	CD	1,017	0.1	500	0.6	0.3%	0.0
Chemical and pharmaceutical industry	CE/CF	4,960	0.6	26	0.9	0.0%	15.2
Rubber, plastics and other non-metals	CG	19,917	2.3	25	2.3	–0.5%	7.0
Metallurgy and metal products	CH	71,643	8.2	27	6.8	–2.4%	2.9
Computer and electronic products	CI	6,936	0.8	85	0.6	0.1%	5.7
Electrical materials and equipment	CJ	9,089	1.0	50	0.9	–0.7%	5.6
Machinery and equipment	CK	22,331	2.5	55	2.5	0.2%	5.6
Transport equipment	CL	19,232	2.2	69	2.7	0.2%	13.0
Furniture and other manufactured goods	CM	14,664	1.7	9	1.1	–0.1%	1.2
Electricity, gas and steam	DD	2,355	0.3	80	2.5	–0.5%	1.2
Water supply and treatment	EE	6,472	0.7	49	0.7	0.1%	2.0
Construction	FF	60,180	6.9	3	5.8	–3.8%	0.3
Commerce; vehicle repair	GG	136,790	15.6	14	10.7	0.4%	1.9
Transport and storage	HH	44,146	5.0	20	5.0	0.6%	3.0
Hospitality	II	60,537	6.9	8	5.4	1.7%	0.1
Editing, video, radio and television	JA	5,720	0.7	8	0.6	–0.2%	0.3
Telecommunications	JB	2,201	0.3	46	1.3	–0.1%	5.7
Information technology	JC	13,539	1.5	12	1.1	0.2%	2.1
Real estate activities	LL	5,897	0.7	2	11.3	1.9%	0.1
Consultancy and technical activities	MA	45,520	5.2	4	4.4	0.2%	0.4
Research and development	MB	7,515	0.9	37	0.7	0.0%	6.3
Other professional activities	MC	12,161	1.4	3	0.8	–0.0%	1.5
Ancillary services	NN	63,799	7.3	30	3.1	0.5%	1.1
Education	PP	77,451	8.8	41	5.3	0.9%	0.0
Health care activities	QA	47,750	5.4	28	5.4	0.6%	0.1
Social services activities	QB	27,783	3.2	100	1.1	0.2%	0.4
Recreational and cultural activ.	RR	15,051	1.7	9	1.7	0.6%	0.2
Other services	SS	26,635	3.0	5	1.5	0.3%	2.0
Total general	**TOTAL**	**878,504**	**100.0**	**22**			**1.7**

Source: Compiled by the authors based on Eustat. And Sabi - Bureau Van Dijk.

Appendix 9
Firms in a situation of economic-financial vulnerability

Sector A38	Sector A38 Code	Economic Vulnerability %	Economically Vulnerable Firms	Credit Vulnerability %	Credit Vulnerable Firms
Agriculture, livestock and fishing	AA	34	86	20	49
Extractive Industries	BB	43	17	23	9
Food, beverages and tobacco	CA	31	147	30	139
Textiles, apparel, leather and footwear	CB	36	34	35	33
Wood, paper and printing	CC	26	134	37	191
Manufacture of coke and refined petroleum products	CD	0	0	0	0
Chemical and pharmaceutical industry	CE/CF	20	26	18	24
Rubber, plastics and other non-metals	CG	23	71	27	83
Metallurgy and metal products	CH	21	343	25	409
Computer and electronic products	CI	25	21	21	18
Electrical materials and equipment	CJ	24	28	25	30
Machinery and equipment	CK	18	90	23	115
Transport equipment	CL	33	42	28	36
Furniture and other manufactured goods	CM	25	151	30	183
Electricity, gas and steam	DD	42	117	32	89
Water supply and treatment	EE	22	20	26	24
Construction	FF	24	765	36	1,140
Commerce; vehicle repair	GG	29	1,913	33	2,200
Transport and storage	HH	32	446	26	359
Hospitality	II	32	492	39	597
Editing, video, radio and television	JA	33	89	25	67
Telecommunications	JB	29	19	33	22
Information technology	JC	29	153	17	89
Real estate activities	LL	24	508	18	392
Consultancy and technical activities	MA	28	665	16	374
Research and development	MB	42	34	22	18
Other professional activities	MC	31	229	20	148
Ancillary services	NN	27	314	20	227
Education	PP	35	138	23	91
Health care activities	QA	20	116	11	63
Social services activities	QB	29	53	24	45
Recreational and cultural activ.	RR	29	134	24	111
Other services	SS	37	163	31	137
Total general	**TOTAL**	**28**	**7,558**	**28**	**7,512**

Source: Gil de San Vicente *et al.* (2020).

Appendix 10
Anti-crisis measures in Baden-Wüttemburg, Upper Austria and the Basque Country

Regional support measures in Baden-Württemberg

Measures of a financial nature	Beneficiaries	Objectives
"*Corona Soforthilfe*": direct aid for the impact of the pandemic in the form of a non-refundable grant of up to EUR 30,000.	SMEs with up to 50 employees.	Immediate injection of liquidity to applicant companies so that they can continue to operate.
Liquiditätskredit Plus der L-Bank: "loan plus plan" for companies whose business is healthy, but who have entered into a delicate financial situation due to the pandemic. It is a mortgage on the company's assets for a value of EUR 10,000 to 5 million.	Self-employed and companies up to 500 employees.	To cover the liquidity needs of companies that have been left without sufficient resources due to a drop in turnover caused by the pandemic, and that need to make investments to reorient their business or increase in scale and/or face other expenses to overcome the crisis and remain viable.
"*Beteiligungsfonds für den Mittelstand*": fund for ownership/capital participation in medium-sized companies at a minimum of EUR 800,000 per case.	Medium-sized companies with 50-250 employees / max. EUR 50 million annual turnover / max. EUR 43 million in their balance. In particular companies that play a key role in the regional economy whose collapse would mean a breakdown of supply chains to leading-edge companies.	Improve the capitalization of medium-sized enterprises, sustain their credit ratios and stabilize the (functioning of the) business fabric. In line with this last point, the measure also aims at preventing key companies in the regional supply chains from being acquired by third parties (in particular foreign entities).
Landesbank Program: support from the "central" bank of the region in the form of granting companies a deferral of payments on loans granted by the savings banks operating in the region with a delay of up to 12 months.	All types of companies without exception.	Supporting companies' cash flow stresses and sustaining their solvency in the medium term.
Start-up BW Pro-Tect: participation of the Land in an *ad hoc* capital round up to EUR 400,000 which can be converted into a loan repayable after the event.	Start-ups less than 5 years' old that have already gone through a first round of funding. Start-ups have to get a set of private investors to participate for 20% in the ad hoc capital round in which the Land enters.	Safeguard the capitalization of start-ups in successive fundraising rounds (which may be delayed by the pandemic). Acting as a bridge loan.
Measures of a commercial/foreign trade nature	**Beneficiaries**	**Objectives**
Guarantees in connection with export credits.	Companies that have taken out reinsurance policies with providers of trade finance services recognized by the regional government.	To cover the losses that companies may suffer due to the freezing or cancellation of foreign trade operations by COVID19.

Measures of a legal/administrative nature	Beneficiaries	Objectives
Relaxation of obligations in the face of insolvency.	Companies at risk of becoming insolvent.	Grant more space to reach agreements to avoid firms declaring insolvency.
Measurements of a digital nature	**Beneficiaries**	**Objectives**
Fast Internet Provision for the Black Forest	Emphasis on tourism organizations, agricultural providers, winter sports companies, domestic enterprises and schools, located in a part of the Land with poor digital coverage areas.	Develop (the use of) broadband in areas of difficult access.
Cyberwehr (*): responding to cyber security incidents.	Healthcare and nursing infrastructure, including hospitals, doctors' offices, pharmacies and testing laboratories, care facilities and mobile care services.	Ensure the proper functioning of communications and infrastructure in relation to the health system.
PPP for cyber-protection of critical infrastructure.	Transport and traffic companies, power plants, water suppliers, information and communication technology companies, as well as hospitals.	Improve cyber security for cities and municipalities, businesses and society, as well as municipal public services and the health system in Baden-Württemberg.

Source: Prepared on the basis of information from the Federal State of Baden-Württemberg (https://www.baden-wuerttemberg.de/) of the Baden-Württemberg Ministry of Economics, Employment and Housing (https://wm.baden-wuerttemberg.de/), from Buergschaftsbank, Baden-Württemberg Guarantee Bank (https://www.buergschaftsbank.de/) and information extracted through interviews with public policy professionals in Germany and people representing Basque companies with establishments in Baden-Württemberg

Regional support measures in Upper Austria

Measures of a financial nature	Beneficiaries	Objectives
Landeshaftungen für Mittelstand und Großbetriebe: Credit guarantees.	Medium and large companies.	Support for the solvency of companies in the region.
Härtefonds für Kleinbetriebe: non-refundable grants for small businesses that do not qualify for the federal government's program.	SMEs.	Injection of liquidity into companies to support their solvency.
Corona-Bürgschaft für Kleinbetriebe: Credit guarantee for small businesses not covered by the federal credit guarantee program.	SMEs.	Injection of liquidity into companies to support their solvency.
Start-up Paket: public contribution in the form of a grant depending on whether a start-up succeeds in increasing its capital. If a start-up obtains capital from new investors (or additional capital from existing investors), the regional government offers the same amount (up to EUR 800,000) and the company will have to pay it back over time.	Start-ups less than 5 years' old, which meet certain innovation criteria and whose business suffers from the pandemic.	To assist in the capitalization of the company (indirectly) and in the financing of ongoing expenses, complementing capital with liquidity.
Measurements of a digital nature	**Beneficiaries**	**Objectives**
Digitalisierungspaket: support for the implementation of digital distribution models and general support for the implementation of digital solutions.	All types of companies.	Support for digitization to maintain productive activity.

Source: Based on information from the government of the Federal State of Upper Austria (https://www.land-oberoesterreich.gv.at/ooe_paket.htm) and from interviews with people involved in the design and implementation of regional policies in Upper Austria and from Basque companies based in Austria.

Regional support measures in the Basque Country

Measures of a labor nature and regarding employment protection	Beneficiaries	Objectives
Extraordinary Lanbide (Basque Employment Service) aid for the self-employed or freelancers.	Entrepreneurs or self-employed.	Support for entrepreneurs and self-employed people who have been affected by a cessation of activity. Provide liquidity.
Measures of a financial nature	**Beneficiaries**	**Objectives**
0% financing line for SMEs and the self-employed (Basque Government and Elkargi).	Self-employed and SMEs.	Injection of liquidity to guarantee the solvency of the companies.
Bideratu COVID-19 Program: Refundable aid for restructuring and relaunching firms in difficulty.	SMEs with more than 20 employees.	Providing SMEs with liquidity to meet companies' payment obligations.
Advance payment under INDARTU program.	Companies (large and SME).	Relieve cash flow constraints by advancing payments for investments supported by the program.
Deferral of rent payments in SPRILUR and INDUSTRIALDEAK industrial estates and technology parks.	Firms.	Providing companies with liquidity by easing cash flow constraints.
Deferral of payments for returns from Gauzatu Industria, Bideratu or Bideratu Berria programs.	Companies benefiting from programs that prove to be affected by the crisis.	Relaxing tensions in treasury.
Measures to support foreign trade	**Beneficiaries**	**Objectives**
Reinforcement of external consultancy services through the Basque Trade network.	All types of companies.	Provide advice and up-to-date information on the situation in the different destination countries.
Measures in the digital field	**Beneficiaries**	**Objectives**
INPLANTALARIAK program of advice and implementation of teleworking.	Self-employed and SMEs.	Provide tools to continue the activity during the crisis.
INDUSTRIA DIGITALA COVID-19: grants to promote the implementation of telework.	Industrial SMEs.	Alleviating companies' expenses as a result of forced teleworking during the crisis.
CYBER SECURITY INDUSTRY: Grants to boost cyber security measures.	Industrial companies and technical, design and logistics service companies.	Ensuring cyber security in the industrial environment.
Broadband Extension Plan.	Broadband operators.	Improve access to digital infrastructure in business parks, population centers and scattered areas.
R&D support measures	**Beneficiaries**	**Objectives**
R&D COVID 19: Direct aid in the form of non-refundable grants, R&D projects related to the fight against coronavirus, fundamental research, industrial research and experimental development.	RVCTI agents and companies.	Coordinate society's contribution to R&D and the development of capacities and products to meet the needs arising from the pandemic.

Source: Prepared on the basis of information from the Basque Government and SPRI (https://www.spri.eus/es/ayudas/), and interviews with people responsible for the design and implementation of policies and programs in the Basque Country, as well as people representing Basque companies.

Glossary

EEA	European Environmental Agency
CNMC	The National Commission of Markets and Competition
DESI	Digital Economy and Society Index
EBIT	Earnings Before Interest and Taxes
EFTA	European Free Trade Association
ERTE	Temporary Redundancy Plans
ETI	Energy Transition Index
EU	European Union
EVE	Basque Energy Agency
FDI	Foreign direct investment
GDP	Gross domestic product
GVA	Gross value added
ICEX	Spanish Institute for Foreign Trade
ICO	Official Credit Institute
INE	Spanish National Statistics Institute
IOT	Input-output tables
IPI	Industrial Production Index
LCE	Labour cost per employee
OM	Oslo Manual
OECD	Organisation for Economic Co-operation and Development
PCT	Patent Cooperation Treaty
PCTI	Science, Technology and Innovation Plan
PEPP	Pandemic emergency purchasing programme
PPP	Purchasing power parity
PSIP	Poverty and social inequalities survey
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
SAFE	Survey on the Access to Finance of Enterprises
SDA	Sustainable Development Goals
SPRI	Basque Development Agency
SSDS-SNS	Statistics of Demand for Social Services - Survey of Social Needs
TPES	Total primary energy supply
ULC	Unit labour cost
UNCTAD	United Nations Conference on Trade and Development
WEF	World Economic Forum
WiD	Women in Digital
WoS	Web of Sciences
ZEW	Centre for European Economic Research

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