

2 Strengths and challenges in the regional development of Andalusia

The chapter provides an overview of the main trends of the region, in the economic, social and environmental fields, setting the basis for policy recommendations in the following chapters. The chapter first describes the mining sector in the Spanish and Andalusian context. It then examines the demographic patterns in the region followed by its main economic trends. The final section of the chapter examines the main enabling factors for regional development and the quality of life of its citizens.

Assessment and policy takeaways

Andalusia is the southernmost region of Spain, has the largest population and the second greatest land area in the country (17.8%). It is the lead mining region in Spain (38.6% of mining production) and a growing mining player in Europe, standing out as the second European copper producer. The Iberian Pyrite Belt (IPB), located between Seville, Huelva and Portugal, represents an international mining asset on metallic minerals. Huelva is in fact the main mining region at Territorial Level 3 (TL3) in Andalusia, containing 70% of the regional metallic mining production.

While other economic activities (notably tourism and agriculture) represent much larger shares of Andalusia's gross domestic product (GDP) and employment, mining has been an important driver during the recovery of the 2008 global financial crisis. If well managed, this sector can also play an important role in the recovery from the COVID-19 crisis.

This chapter identifies trends in the mining sector for Andalusia (TL2 region) and Huelva (TL3 region or province) as well as factors and bottlenecks for development when compared to a benchmark of OECD mining regions and national performance. These include the following:

- Andalusia records a slightly positive population growth (0.79% annual average since 2001) similar to the national average (0.81%) and well above the OECD TL2 benchmark (0.33%). However, this rate has slowed in line with the economy in 2008, mainly due to interregional outmigration of young people.
- The region enjoys a relatively larger share of the working-age population (67% of the total population) than nationally (65.8%) and in the OECD TL2 benchmark (64%). The share of the elderly population (17%) is also below the average of the OECD TL2 benchmark (20%). The relatively large labour force, along with a high unemployment rate, can represent a relevant source of labour supply for mining development. Yet, the declining trend in the fertility rate, as well as the outmigration of young people, threatens this demographic bonus.
- Andalusia's economy is large but underperforms when compared to national and international levels. The region is the third-largest contributor to national GDP (13.3% in 2019), yet its GDP per capita and productivity level are the third-lowest in the country and far below the OECD TL2 benchmark. Likewise, by 2020, nearly 1 out of every 5 unemployed Spaniards were Andalusian (22.7% of national unemployment).
- The financial crisis hit Andalusia's economy hard. The region has not been able to close the income and productivity gap with the national average to the levels prior to the 2008 crisis. By 2018, Andalusia's GDP per capita was 74.2% of the national average, ranking as the third-lowest amongst Spanish regions. Without the right policy response, the COVID-19 crisis could further broaden the gap.
- This structural gap is driven by a higher share of low-value-added and seasonal service activities. The service sector (75% of Andalusia's GDP) is mainly made up of low-value-added activities including retail, public administration and real estate. This leads to an entrepreneurial ecosystem dominated by a high proportion of small businesses (30 inhabitants per establishment, compared to 33.4 in Spain). As a result, 97.7% of companies have fewer than 20 employees, representing 53% of employment.
- Mining has contributed to the regional recovery after the 2008 crisis. Contrary to the trends in construction and tourism, the value of the production and share of regional employment of metallic mining has grown steadily since 2010. During 2000-18, employment in metallic mining grew above the levels of agriculture and construction. Similar to the 2008 financial crisis, the

mining sector (mainly the metallic mining subsector) has shown resilience during the COVID-19 crisis and, thus, has the potential to support the economic recovery of the region.

- While Andalusia stands out internationally in a number of well-being dimensions, notably safety, community support and environmental quality (e.g. air quality, biodiversity), the region has scope to improve critical enabling factors for development. They include education attainment levels, coverage of high-speed broadband and innovation levels.

Policy takeaways

- Co-ordinated regional strategies to promote mining development and align education and training programmes with mining industry needs can help mobilise the working-age and unemployed population. Policies to boost the business ecosystem across the mining value chain can contribute to attract new skilled workers and retain the young population in the region.
- Regional policy strategies could leverage the mining sector to help Andalusia accelerate the recovery from the COVID-19 crisis and rebuild the economy with a higher share of high-value-added activities. Promoting innovation in Andalusia's mining value chain can unlock new business opportunities for local firms and small- and medium-sized enterprises (SMEs) to transition towards higher and stable income sources.
- Better conditions for regional development and increased well-being of citizens requires long-term strategies to raise education levels, access to quality broadband and innovation levels in the region.

Introduction

This chapter offers a comprehensive diagnosis of Andalusia, Spain, and its most active mining provinces, particularly Huelva. The chapter compares Andalusia's development against national trends and a benchmark of other OECD mining regions at Territorial Level 2 (TL2) and Territorial Level 3 (TL3) (see Box 2.1 for an explanation of territorial categorisation). Based on these comparisons, the analysis identifies major strengths and bottlenecks in Andalusia's development and well-being. While mining is not the main contributor to the region's GDP and employment, this diagnosis reveals the relevance of leveraging Andalusia's mining potential to create a prosperous and sustainable future.

The chapter first describes the mining sector in the Spanish and Andalusian context. It then examines the demographic patterns in the region followed by its main economic trends. The final section of the chapter examines the main factors for regional development including the quality of life of its citizens.

To better compare the performance of Andalusia against comparable regions also specialised in mining and extractive activities, the analysis in the chapter makes use of two benchmarks, one based on comparable TL2 regions to Andalusia and a second one based on comparable smaller TL3 regions to Huelva.

The construction of the TL2 benchmark makes use of all OECD TL2 regions (394 regions) and conducts selection criteria based on the following three variables to identify comparable regions with Andalusia:

- **Weight of the mining sector** based on the economic weight of industry (excluding manufacturing) in the region and measured as the share of the total gross value added (GVA) of mining in the TL2 region.
- **Mining sectoral specialisation** measured through a location quotient defined as the share of the mining sector in the region to the total share, against the national share in mining to the overall share. Specialisation is calculated both in terms of employment and of GVA.
- **Degree of rurality** of the region, measured as the share of the population in the region living in functional urban areas (FUAs).

The selected regions in the benchmark are those with less than half of the standard deviation from Andalusia's level in the three indicators and all specialised in mining. Across all OECD TL2 regions, the analysis identifies a benchmark of 29 OECD TL2. A complete list of the mining regions selected in the analysis is provided in Annex Table 2.A.1.

The second analysis is based on a more granular approach at the TL3 level. Its objective is to analyse the performance of Huelva, the most specialised TL3 mining region of Andalusia, to comparable OECD TL3 regions specialised in mining and extractive activities. In order to establish international comparisons, the analysis identifies the benchmark of regions based on the following five characteristics:

- **Population.** Measured as the total number of inhabitants in the TL3 region.
- **Density.** Calculated as the number of inhabitants per kilometre square.
- **Weight of the mining sector.** Measured as the total gross value added (GVA) of mining in the TL3 region.
- **Mining sectoral specialisation.** Calculated as the employment and GVA regional share of the industry over the national share.
- **Degree of rurality** based on the OECD TL3 revised typology (Box 2.1). This typology classifies Huelva as a non-metropolitan region close to a small/medium city. Therefore, only regions classified in the same TL3 group as Huelva are included in the benchmark.

As with the TL2 benchmark, the selected regions are those with a value less than half of the standard deviation from Huelva. The analysis identifies 31 OECD TL3 regions with similar characteristics to those of Huelva. A complete list of the mining regions selected in the analysis is provided in Annex Table 2.A.2. The chapter and the rest of the report will refer to TL3 regions as provinces or TL3 regions, interchangeably.

Box 2.1. OECD TL3 revised typology

The OECD regional database collects and publishes regional data at two different geographical levels, namely large regions (Territorial Level 2, TL2) and small regions (Territorial Level 3, TL3). Both levels encompass entire national territories. With some exceptions, TL2 regions represent the first administrative tier of subnational government (i.e. states in the United States, *estados* in Mexico or *régions* in France). TL3 regions are smaller territorial units that make up each TL2 region.

The OECD has adopted a new typology to classify administrative TL3 regions. This classification allows measuring socio-economic differences between regions, across and within countries. It is based on the presence and access to functional urban areas (FUAs) – a concept defining cities and the urban hinterland, in other words, urban economic agglomerations.

By controlling for these regional characteristics, the typology classifies TL3 regions into two groups, metropolitan and non-metropolitan regions. Within these two groups, five different types of TL3 regions are identified. The metropolitan regions (MRs) adopt 50% of the population of the TL3 (small) region living in an FUA of at least 250 000 people as a threshold; non-metropolitan regions (NMRs) 60-minutes' driving time as a threshold, a measure of access to an FUA.

The methodology follows the criteria below:

- **Metropolitan TL3 region**, if more than 50% of its population live in an FUA of at least 250 000 inhabitants. MRs are further classified into:
 - **Large metropolitan TL3 region**, if more than 50% of its population live in an FUA of at least 1.5 million inhabitants.
 - **Metropolitan TL3 region**, if the TL3 region is not a large metropolitan region and 50% of its population live in an FUA of at least 250 000 inhabitants.
- **Non-metropolitan TL3 region**, if less than 50% of its population live in an FUA. NMRs are further classified according to their level of access to FUAs of different sizes into:
 - **With access to (near) a metropolitan TL3 region (NMR-M)**, if more than 50% of its population live within a 60-minute drive from a metropolitan area (an FUA with more than 250 000 people); or if the TL3 region contains more than 80% of the area of an FUA of at least 250 000 inhabitants.
 - **With access to (near) a small/medium city TL3 region (NMR-S)**, if the TL3 region does not have access to a metropolitan area. Fifty percent of its population has access to a small or medium city (an FUA of more than 50 000 and less than 250 000 inhabitants) within a 60-minute drive; or if the TL3 region contains more than 80% of the area of a small or medium city.
 - **Remote TL3 region**, if the TL3 region is not classified as NMR-M or NMR-S, i.e. if 50% of its population does not have access to any FUA within a 60-minute drive.

The described procedure leads to more statistical consistency and interpretable categories that emphasise urban-rural linkages and the role of market access.

Megatrends affecting regions specialised in mining and extractive activities

The geographically concentrated nature of mining leads to a highly specialised economy, bringing with it particular challenges and opportunities to mining regions and the well-being of its inhabitants. Global megatrends, including demographic change, climate change and the transition to a low-carbon economy, as well as digitalisation and automation, are transforming industries and societies. These megatrends are also bringing new challenges and opportunities to the development of mining regions (Table 2.1).

Table 2.1. Opportunities and challenges of megatrends for mining industry and regions

	Opportunities	Challenges
Changes in demographic trend (population ageing and migration)	<ul style="list-style-type: none"> • Successful integration of migrants may enhance labour supply. • Lifelong learning can enable the old workforce to keep adding value. 	<ul style="list-style-type: none"> • Ageing population/local demographic decline leads to a shortage of labour. • Unsuccessful migrants' integration may lead to social problems. • Many migrants tend to reside only temporarily and eventually move south to larger cities.
Climate change and environmental pressures	<ul style="list-style-type: none"> • High standard of environmental performance and requirements will soon be a competitive advantage for regions that have transitioned to fossil-free, low electrified mining and the development of environmentally friendly technologies to reduce carbon emissions in mineral and metal processes. 	<ul style="list-style-type: none"> • Pressures for the mining industry to improve its performance and reduce its environmental footprint. • Harder policies and regulation to issue permits to operate in the future. • Higher public reticence to accept mining explorations and openings.
Technological innovation (e.g. digitalisation, automation, decentralised energy)	<ul style="list-style-type: none"> • Digitalisation/automation may compensate for shortages of labour in some sectors. • Can make mining regions more attractive to live by providing quality public services, including remote healthcare solutions. • Creation of new jobs by involving regional actors to develop new digital- and automated solutions. • Offer greater labour opportunities for women and various segments of the population. 	<ul style="list-style-type: none"> • Displace certain workers in the mining sector, mainly the ones that perform more repetitive tasks. • If technological innovation is produced outside the region, it can affect the competitiveness of the region. • Can reduce the need for certain minerals by replacing them with laboratory products or by extracting them from the recycling process.

As will be explored in the next section, Andalusia is well-positioned to address the demographic challenges. Mining environments are typically vulnerable to demographic challenges that affect their workforce structure. Against this backdrop, Andalusia's relatively young workforce is an important asset. In addition, Andalusia's municipalities specialised in mining also have a relative gender balance, which contrasts with the trend in many mining regions (Abrahamsson, 2006^[1]). Workforce availability in the mining regions as well as gender balance and high retention capacity are an important asset for Andalusia's mining sector and its development potential.

In terms of the transition to a low-carbon economy, mining regions can and should be relevant actors to attain environmental goals. These regions supply the minerals and materials needed to develop green technologies. As Chapter 3 will explore, increasing the supply of energy from renewable sources and developing materials and technologies that reduce carbon emissions is an untapped opportunity in mining regions including in Andalusia. At the same time, the extractive nature of mining activities is a matter of social and political concern, which has led to increasing pressure to reduce the environmental impact from these activities. Increasing sustainability across such extractive processes will place mining regions as key patterns to attain climate goals and reduce societal pressure over their activities.

Finally, technological change and digitalisation can further reduce the cost of moving people and goods and providing services as well as increase productivity. Technology is already changing the way minerals are extracted and transformed. IT also allows attaining a more sustainable extractive process by lowering consumption of natural resources and fossil fuels and performing more controlled extractions that produce a minimum impact on the earth. This megatrend is particularly relevant in Andalusia as the region hosts extractive but also transformative firms in its mining business environment (Chapter 3).

Andalusia is likely to be affected by these megatrends. As this study will show, some of the megatrends brought by demographic changes, pressures to transition to a low-carbon economy and effects from technological progress are already bringing a number of challenges and opportunities in the mining ecosystems of Granada, Huelva and Seville. Indeed, as Chapters 3 and 4 will stress, the impact of megatrends on mining municipalities will very much depend on policy responses to address the changes and prepare firms and communities for future changes.

Spain, a relevant mining country

Spain has a varied and important mining production thanks to its geological diversity. This mining richness places Spain as the third country in Europe (after Sweden and Finland) with the most mineral raw material resources, becoming a leading reference among European mining countries (La Razón, 2020^[2]). The significance of Spain's mining output is highlighted in the 2018 Spanish mining statistics report (Ministerio para la Transición Ecológica y el Reto Demográfico, 2018^[3]):

- Europe's second-largest producer of copper (used for electricity conductors, pipes and structures).
- Europe's only producer of sepiolite and glauberite, used in pharmaceutical products and detergents among others.
- Europe's only producer of magnesite and potassium salts widely used in agriculture.
- A leading producer of fluor spar and gypsum used for the formulation of insecticides, fluxes and a variety of ornamental purposes and construction respectively.

Mining activities in Spain have a great historical tradition dating back centuries and the sector has been fundamental during the industrialisation of the country from the 19th century onwards. With the arrival of the Romans, a significant advancement was experienced thanks to the incorporation of new mining-related technologies. The Arabs and the subsequent discovery of America continued the mining activity, reactivating silver, copper and lead mines. In the second half of the 19th century, the incorporation of legal regulations (Mining Law of 1868) facilitated the entry of foreign capital along with new techniques that intensified the production and benefits of minerals such as copper, pyrite, iron or coal (IGN, 2018^[4]; Montagut, 2015^[5]).

From coal to mining of leading minerals

The mining tradition in Spain was initially focused on energy minerals but has rapidly transitioned towards one of metallic products. Historically, energy mineral products (coal) were the primary mineral resource in the country but its current production has declined sharply in both quantity and value. In fact, a decree in 2018 ordered the repeal of all subsidies associated with coal mining. Instead, metallic and ornamental mining resources have remained active and nowadays generate the biggest mining value production throughout the territory. Most of the mining production (60%) comes from metallic and non-metallic minerals, with the rest being quarry, ornamental rock and energy minerals.

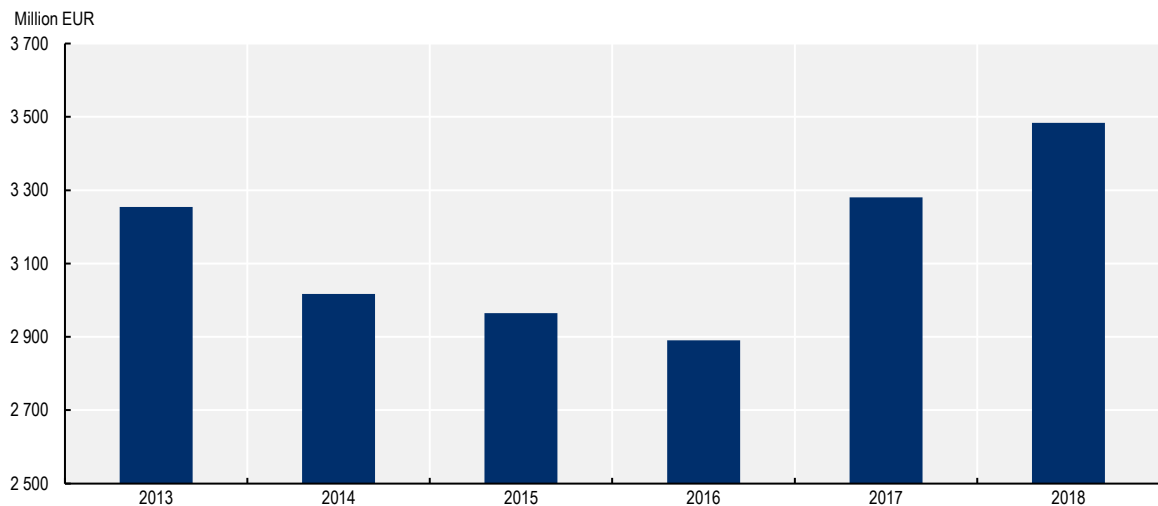
- **Metallic mining** is the current driving force of the Spanish mining industry, with the IPB (FPI), located between Seville, Huelva and Portugal, containing one of the largest amounts of non-ferrous metal reserves in the world. About 2 000 million tonnes of ore have been exploited already and

there are still more than 400 million tonnes to be exploited (Junta de Andalucía, 2016^[6]). In addition, the largest gold mine in Europe is located in Asturias, and other regions such as Castilla y Leon and Extremadura have deposits of wolfram, tin, lithium and vanadium.

- In **non-metallic mining**, Spain is an important global player standing as the leading world producer of marble and gypsum. The marble of the Macael area or the gypsum from Almeria are global players in non-metallic mining. Yet, this type of mineral is highly reliant on construction cycles. Relevant deposits of potash for fertilisers and vacuum salt are also available in Catalonia.

Overall, the mining activity in Spain has experienced fluctuations during the last decade. While activity resumed in the immediate aftermath of the crisis, a downward trend continued until 2016, mainly due to the fall in the price of energy products (Ministerio de Energía, Turismo y Agenda Digital, 2016^[7]). However, since 2018, the contribution of the mining sector grew in Spain and reached 29 890 direct jobs and 2 731 mines (Figure 2.1). This upward trend was associated with the recovery of international prices and the consequent reopening of mines in Spain.

Figure 2.1. Evolution of the mining production value of Spain, 2013-18



Source: Ministerio para la Transición Ecológica y el Reto Demográfico (2018^[3]), *Estadística Minera de España*, https://energia.gob.es/mineria/Estadistica/DatosBibliotecaConsumer/2018/Estadistica_Minera_anual_2018.pdf (accessed on 3 October 2020).

The mining activity in Spain does not occur equally throughout the territory. At a regional level, Andalusia concentrates the highest share of employment and production in the Spanish mining sector, tripling the production and doubling the employment of the second most relevant mining region in the country (Catalonia). The ranking of the five regions with the largest number of employees is completed by Asturias, Castilla y Leon and Galicia. These 5 autonomous communities represent almost 68% of national mining employment. The next sections outline the chief characteristics of Andalusia, its demographic and economic trends as well as the status of its enabling factors for development.

Andalusia, the leading mining region in Spain

A dispersed settlement structure and the largest Spanish region by land area

Andalusia is the southernmost region of Spain, and the second-largest region by land area. It borders Portugal to the west, as well as the Mediterranean Sea and the Atlantic Ocean along its coasts. Andalusia

is made up of 106 municipalities and is one of the 17 autonomous communities¹ that constitute Spain. Andalusia is composed of eight TL3 regions: Almeria, Cadiz, Cordoba, Granada, Huelva, Jaen, Malaga and Seville. With 1.95 million inhabitants, the TL3 region of Seville is the largest province in Andalusia and the city of Seville (688 592 inhabitants) is the fourth largest city in Spain.

Table 2.2. TL3 Andalusian provinces by OECD typology

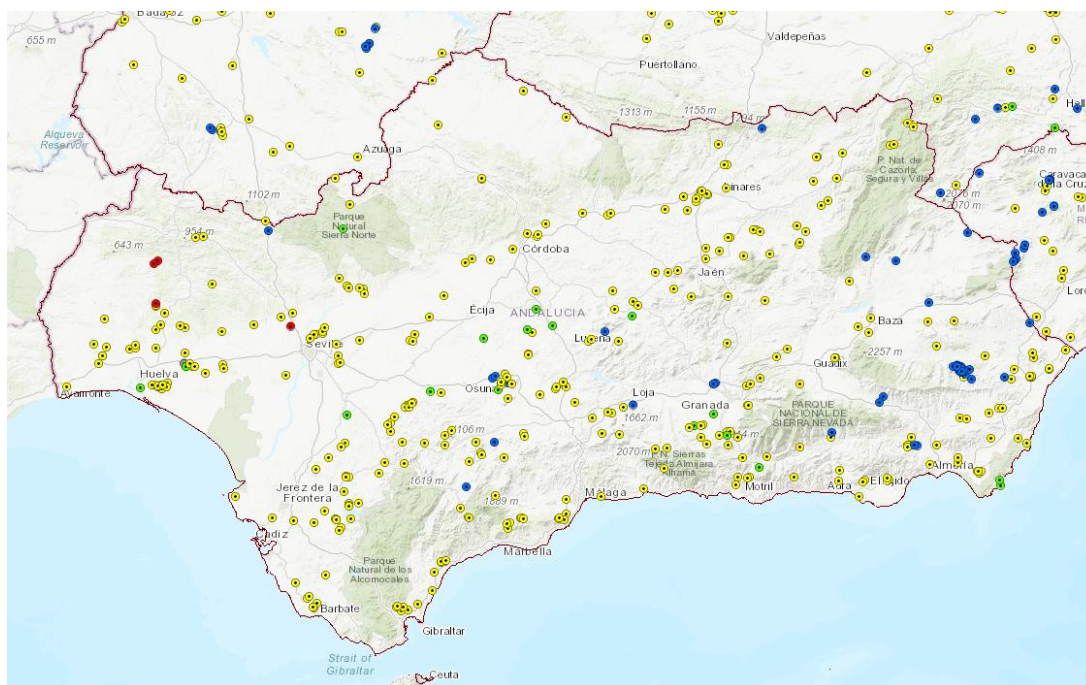
TL3 region Andalusia	Population, 2019	Surface (km ²)	Density (inhabitants/km ²)	OECD typology
Seville	1 957 197	14 042	139.38	Regions with a city >1M
Malaga	1 683 271	7 308	230.33	Regions with a city >250K
Cádiz	1 251 149	7 435	168.26	Regions near a city >250K
Granada	914 678	12 635	72.39	Regions with a city >250K
Cordoba	785 240	165 321	22.52	Regions near a city >250K
Almeria	706 871	8 774	80.56	Regions with/near a city <250K
Jaen	632 027	13 496	46.83	Regions with/near a city <250K
Huelva	524 576	10 128	51.79	Regions with/near a city <250K

Note: The classification criteria for the OECD typology can be found in Box 2.1.

Source: INE (2020^[8]), *Estadística sobre actividades de I+D. Año 2019*, https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736176754&menu=ultiDatos&idp=1254735576669 (accessed on 12 November 2020).

Figure 2.2 shows the areas with the current highest population density, where Almeria, Huelva and Seville correspond to places with mining deposits. Huelva and Seville host most of the metallic mining production in the region, while Almeria most of the non-metallic production (marble and other aggregates) (Chapter 3). The mineral transformation facilities are mostly located in Seville, as well as the company's central offices.

Figure 2.2. Map of Andalusia with all active exploitations, 2017



Note: The colour of the dots indicates: red - metallic mining; green - industrial minerals; blue - ornamental rocks; yellow - quarry products.

Source: IGME (2021^[9]), *Visor InfoIGME*, <http://info.igme.es/visorweb/default.aspx?configuracion=ESTMINERA> (accessed on 8 February 2021).

Past and present of the mining region of Andalusia

Andalusia has been a mining force throughout history because of its great geodiversity. The extraction activity in Andalusia dates back to no less than 5 000 years ago (Portal Andaluz de la Minería, 2021^[10]), when first sediments are located in the province of Huelva. With the arrival of the Romans in the region, there was a notable advance in mining techniques and tools, as was the case for the rest of the peninsula. Andalusia's increase in mining power was amplified by the implementation of the railroad as a means of transport, which now has one of the oldest and densest networks of Spain.

By the second half of the 19th century, Andalusian mining supplied one-eighth of the world's lead production, one-tenth of the world's copper and one-third of the production of iron and copper pyrites for sulphur, which gives us an idea of the importance of this economic activity in Andalusia. As a result, minerals such as copper were, at that time, pillars of the economic and industrial growth of Andalusia.

The early 2000s put an end to the prosperity of the mining sector, with a slowdown that lasted 10 years in which no work was done in the metallic mining sector. Spanish metallic mines closed down due to the downward fluctuations of metal prices. In the period 2007-12, the extractive mining sector experienced a decrease of 60.43% in its volume of production. After the financial crisis, the trend changed in Andalusia. The region experienced a growth in mining production, whose share over the national production rose from 18.4% in 2010 to 25.8% in 2013 (Ministerio para la Transición Ecológica y el Reto Demográfico, 2018^[3]). Andalusian mining continues to grow as the global market has entered a new period with increasing international demand for minerals.

Mining, a great opportunity for regional development in Andalusia

The present offers a scenario of strategic opportunity for mining in Andalusia. Andalusia has the largest European reserve of non-ferrous minerals with nearly 470 active companies and mining operations that produce 41 million tonnes per year. Mining industry directly employs more than 7 400 people, especially relevant in a region of Spain facing high levels of unemployment.

The value of total production ranks Andalusia the overall mining leader in Spain (Table 2.3) with a share of 38.6% over the total national production value, followed by Catalonia (13%) and Castile and León (9.9%). In 2018, Andalusia accounted for the vast majority of the total national production value of metal ores, as the spearhead of the country. While in quarrying products the distribution by region is more equitable, Andalusia still leads with 22.3% of the total production value, followed by Catalonia (13.5%). As a whole, while Andalusia hosts 17% of all national open mines, it produces 38.6% of the national production value, illustrating the size of Andalusian mining operations and productivity.

Table 2.3. Share of the TL2 regional mining production value and employment over national, 2018

Autonomous community	Share of production value (%)	Share of employment (%)	Main extractions
Andalusia	38.6	24.8	Copper, lead, zinc, silver, plaster, marble
Catalonia	12.9	12.0	Hydrocarbons, potash, industrial rocks
Castile and León	9.9	11.6	Coal, anthracite, slate, glauconite, tungsten
Galicia	7.3	11.3	Kaolin, quartz, slate, granite
Asturias	4.9	8.1	Coal, anthracite, fluorite, gold

Note: Share over the total value.

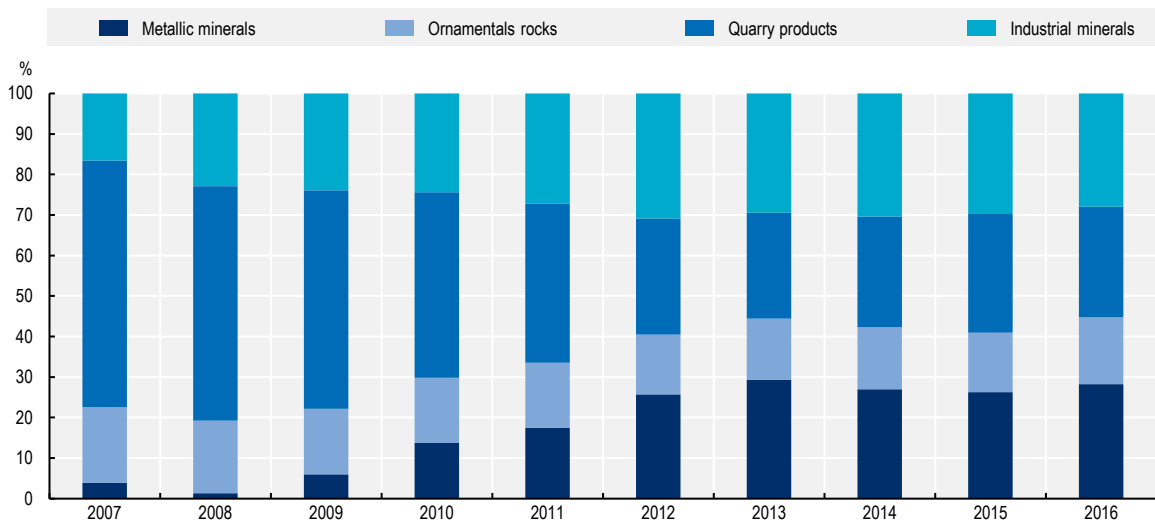
Source: Spanish Government (n.d.^[11]), *Minería y Explosivos*, <https://energia.gob.es/mineria/Paginas/Index.aspx>; Spanish Government (2018^[12]), *Estrategia Minera Nacional 2018*.

Andalusia has gained relevance in the national mining sector and is currently the first national producer and employer for the sector:

- The significant mining expansion in the region has enabled Andalusia to employ 30% more workers in the mining sector over the last 2 decades. While the number of employees in Spain in mining fell from 44 605 in 2000 to 29 890 in 2018, Andalusia increased the number of employees in the mining sector from 5 252 to 7 424 during the same period.
- Andalusia has multiplied by 14 the value of its mining production since 2000. In Andalusia, the reopening of mines – especially of the region of Huelva – has led the current mining value production to expand from EUR 90.8 million in 2000 to generate EUR 1 346 million in 2018.

Over the years, the mining subsectors have evolved differently, with metallic mining being the best performing in the last decade (Figure 2.3). While in the years prior to the crisis, Andalusian mining was mainly based on non-metallic mining (quarry products 61%, ornamental rocks 19% and Industrial products 17%), with the economic downturn brought on by the financial crisis and the halt in construction, metallic mining benefitted from high international commodity prices to gain its greater mining relevance in the region. It is worth remarking that, despite the general economic fall during the financial crisis, industrial and ornamental mining endured the turbulence of external financial shocks relatively well, maintaining stable values between 2009 and 2016 at less than 8% change in the value of production. This indicates an effective resilience of both metallic and non-metallic mining subsectors leading to a sustained production value over time.

Figure 2.3. Value of mining production in Andalusia by metallic and non-metallic subsectors



Source: INE (2020^[8]), *Estadística sobre actividades de I+D. Año 2019*, https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736176754&menu=ultiDatos&idp=1254735576669 (accessed on 12 November 2020); Spanish Government (2018^[12]), *Estrategia Minera Nacional* from 2000 to 2018.

As mentioned in the previous section, of special relevance is the IPB. The Andalusian provinces of Huelva and Sevilla take up almost 60% of the IPB, while the remaining 40% is located in the Portuguese region of Alentejo. This mining resource has more than 82 active mines for resources that are estimated at more than 1 600 Million tonnes of massive sulphides and 2 500 Mt of mineralisation in stock, constituting one of the most important metallogenic provinces in the world and considered one of the deposits with the highest concentration of sulphides in the planet. Overall, Huelva accounts for most of the region's metal production (70%), followed by Seville (30%) which contains the remaining part.

The rising value of some metals, together with the presence of ores in Andalusia, form a scenario of strategic opportunity for the increasing recovery of mining. In Andalusia, copper in particular is increasingly sought after due to the high demand in building clean energy technologies and from industrial processes in Asian countries. In this context, exploration in the entire IPB has expanded and led to the reopening of old mines such as Aguas Teñidas, Riotinto or Sotiel and new ones such as Cobre Las Cruces, while La Zarza, Lomero, San Telmo or Tharsis, among others, are in viability studies (Table 2.4).

Table 2.4. Selected municipalities according to main operating mines in Andalusia, 2020

Municipality	Province	Mine	Company
Calañas	Huelva	Sotiel	MATSA – Minas de Aguas Teñidas
Almonaster la Real		Aguas teñidas, Magdalena	
Minas de Riotinto		Riotinto	Atalaya Mining
Huelva		Copper production and refining	Atlantic Cooper
Alosno		Mina de Tharsis ¹	Maprise
Macael	Almeria	Canteras de Macael	Multiple companies (>300)
Sorbás		Mina de Yeso	Yesos Almería
Gerena	Seville	Las Cruces	Cobre las Cruces
Guillena			
Salteras			
Alnazcollar		Mina de Alnazcollar	Minera los Frailes

Note: Non-operational mines that are being projected or in study and development phases such as Minas del Marquesado and San Telmo have not been retained for the selection.

1. Extraction of iron and copper from the *Tharsis mine* residues.

Source: AYMA Mining (2020^[13]), “¿Dónde se encuentran las principales explotaciones mineras de Andalucía?”, <https://aymamining.com/donde-se-encuentran-las-principales-explotaciones-mineras-andalucia/> (accessed on 4 October 2020).

As the following chapters will outline, the European Union (EU) is increasingly urging countries to make the most of its mineral resources and transformation process to enhance industrial resilience and support the transition to a low-carbon economy. Along that path, Spain and particularly Andalusia are well placed, as several key materials for the transition can be found and exploited in its territories, such as aluminium, cobalt, tin, graphite, lithium, manganese, nickel, gold, silver, rare earths and tungsten. Therefore, Andalusia has the possibility to be a frontrunner and position itself as a key player in the European mining scenario.

Andalusia in a snapshot

The following sections will offer a diagnosis of the demographic and economic trends and enablers for development in the region. Its most outstanding characteristics have been summarised in the following table:

Table 2.5. Highlights of Andalusia by topic

Demographic	Andalusia has the highest population share and is the second-largest region in Spain.
	The population growth that followed the economic expansion in the region stagnated with the arrival of the crisis, as did the rest of the country.
	The region enjoys a demographic bonus, with a young, working-age population and relatively low elderly population ratios.
	The contribution of inflow migration stopped with the economy in 2008, leading to a current trend of outmigration – especially with the young population – to larger cities in Spain such as Barcelona and Madrid due to better labour and educational offer.
Economic	In economic terms, Andalusia is the third-largest contributor to the national GDP although, on a per capita level, it is the third-largest in Spain with the lowest GDP per capita.
	The region experiences a structural gap in economic terms with the rest of the country. The GDP per capita as well as productivity have improved in the last two decades but remain far below the national average values.
	At a sectoral level, the region has experienced a progressive deindustrialisation process towards low-value-added activities such as agriculture, tourism and services. This has led to the seasonality of employment and informality of the labour market. As a result, one in every five unemployed Spaniards are Andalusian (2020).
	However, mining has been an economic engine during the recovery years following the 2008 crisis and the value of its exports has led to represent a quarter of the region's total exports.
Enabling factors for the development	Andalusia still faces low education levels in primary and tertiary education compared to the national levels. Although the region is progressing, there is still room for improvement, particularly at the tertiary level.
	The structure of companies in Andalusia is atomised, with high levels of entrepreneurship led by necessity and mostly oriented toward the low-value services sector.
	In terms of citizen well-being, the region outperforms the OECD benchmark regions in terms of safety, air quality and community support.
	Andalusia's coverage of network connectivity is similar to national levels and OECD regions. However, the speed of the connectivity and the usability of the Internet is slightly below the national values.
	Andalusia invests less in research and development (R&D) than the national and European average. As a result, it ranks as a moderate innovative region in the European context.

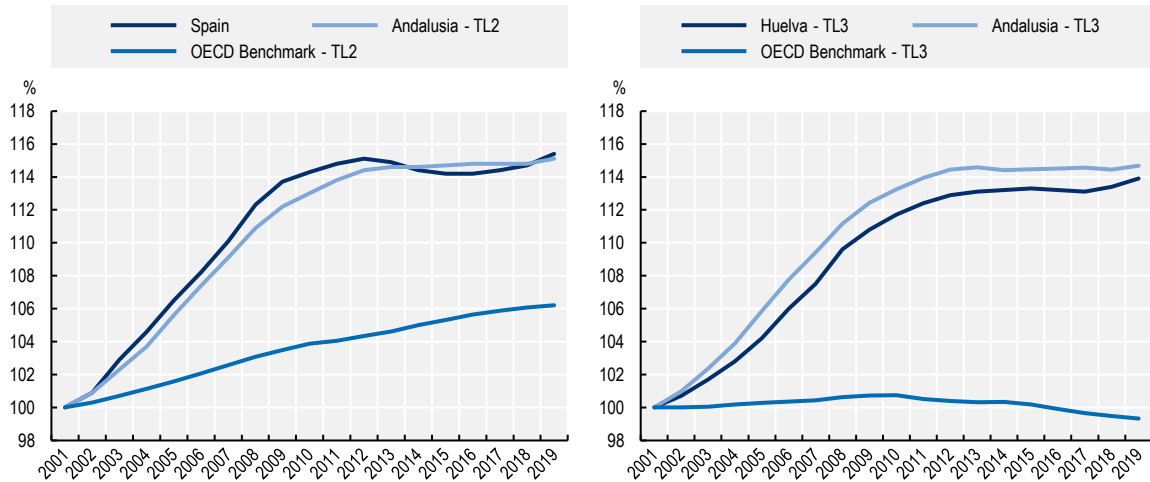
Demographic trends

The soaring population growth in Andalusia has stabilised in the last decade

The growth of the population of Andalusia has mirrored the rapid pace of the rest of the country. Between 2001 and 2019, the population of Andalusia grew by 15.1%, similar to the national average (15.4%) and far greater than the OECD TL2 benchmark (6.2%) (Figure 2.4). The most economically prosperous years of the last decades (2000-07) coincided with the years of maximum demographic growth. The financial crisis affected most OECD countries, in different ways and degrees. Particularly in Spain, a slowdown in the attractiveness of the Spanish economic model meant a drop in the positive balance of migration to the country. Without a sufficiently positive natural replacement, this inevitably meant a change in the trend of demographic growth throughout the years that the crisis lasted. However, the COVID-19 crisis is generating uncertainty over the economy, with direct effects on demographic drifts, as Spain is one of the countries most economically affected, as shown in the *OECD Economic Outlook* report (OECD, 2020_[14]).

At the TL3 level, the population growth of Huelva has grown strongly in the last two decades. The mining province of Huelva has experienced double-digit accumulated growth, reaching 13.9% over the last 2 decades. This is significant compared to the accumulated growth of the OECD TL2 benchmark (-0.6%). However, this positive behaviour is being threatened by migration, mainly of young people, to other regions. Thus, Huelva was the second Spanish province to lose the most inhabitants in 2017, while large cities such as Madrid experienced a population growth in the same year.

Figure 2.4. Population growth rate 2001-19



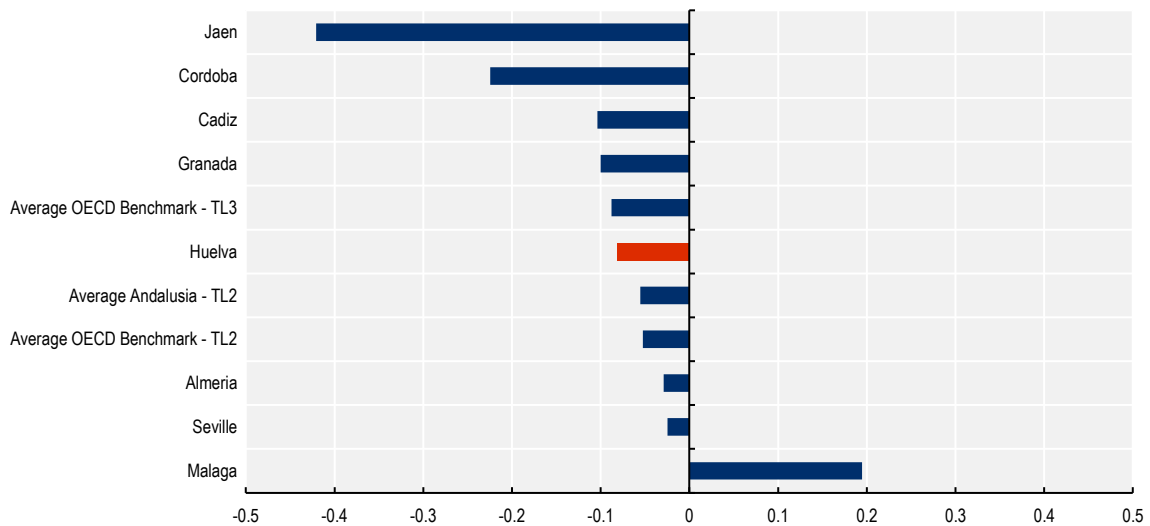
Note: 2001 = 100.

Source: OECD (2021_[15]), “Regional demography”, <https://doi.org/10.1787/region-data-en> (accessed on 27 January 2020).

Young Andalusians from rural areas are migrating...

All of the provinces of Andalusia except for Malaga have experienced a negative regional migratory balance in the last decade (Figure 2.5). Since 2008, a regional movement out of the Andalusian regions, especially severe in rural municipalities, accompanied the population stagnation in absolute terms (Figure 2.4). A recent study analysed the Andalusian municipalities, of which 54% have lost population from 2000 to 2016; in the case of those with less than 5 000 inhabitants, depopulation has affected 71% of them.² An exception to this trend is Malaga, where most of the newcomers were foreigners (70% of total 23 629 in 2019), highlighting its high international attractiveness (Diario Sur, 2020_[16]).

Figure 2.5. Ratio of net migration rate to the total population, during the post-crisis period 2008-18



Note: Average 2008-18.

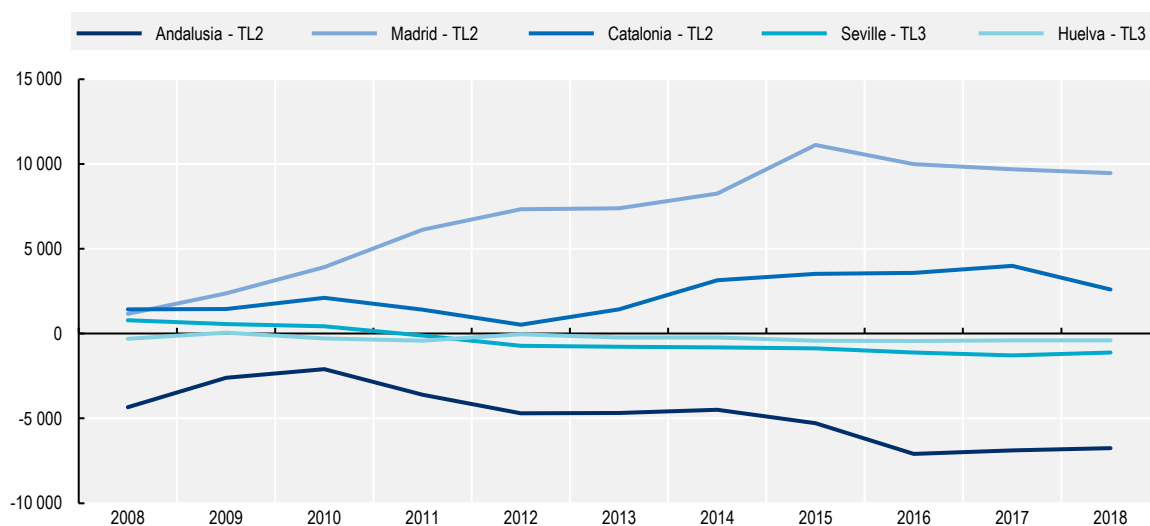
Source: OECD (2021_[15]), “Regional demography”, <https://doi.org/10.1787/region-data-en> (accessed on 27 January 2020).

...to the large cities of the country

The population leaving Andalusia is particularly composed of young people migrating to larger cities of Spain. In the years following the financial crisis, the negative migration balance in Andalusia was slightly accentuated, with a greater trend of youth outmigration from 2011 onwards (Figure 2.6). Furthermore, while the provincial capital, Seville, was in positive net migration between 2008 and 2011, from that year forth the trend has only slowly declined, reaching relative stability in the years 2017 and 2018. Huelva, similarly to its provincial capital, touched positive migration values in 2009, which were then corrected, and has maintained a negative balance since then.

The largest cities in Spain, Barcelona and Madrid, attract a large part of the youth population of Spain (Figure 2.6). Motivations may range from the educational offer to employment possibilities. Both cities have experienced a constant positive migration balance since the crisis, with a particular peak in Madrid since 2014. In fact, by 2018, the number of young people coming from other Spanish regions into Madrid more than doubled the figure in Catalonia. Andalusia, and Seville in particular (the fourth largest city in Spain), has the potential to attract and retain youth. Its mild climate and geographic location can be good levers if supported by greater job opportunities and educational offer (Chapter 3). At the educational level, such is Andalusia's potential for attraction that Granada ranked the third most chosen Spanish city by European students of the Erasmus + programme in 2018 (Libertad Digital, 2018^[17]). As the next section outlines, mining municipalities as well as cities can provide stable, quality work that could help retain and attract youth.

Figure 2.6. Net interregional mobility, persons aged 15 to 29



Note: Inflows minus outflows.

Source: OECD (2021^[15]), "Regional demography", <https://doi.org/10.1787/region-data-en> (accessed on 27 January 2020).

In summary

The demographic drifts of the Andalusian regions are an integral part of their economic performance. Its population grew strongly until the financial crisis of 2007, after which it stabilised for a decade, revealing that the attractiveness of its incoming migration depended partially on the region's economic performance. Nowadays, the uncertainty of the COVID-19 crisis may have a negative effect on population growth, as was the case with the previous crisis. The province of Huelva closely reflects regional and national trends as its sustainability in the medium term is threatened by the rural exodus of younger generations,

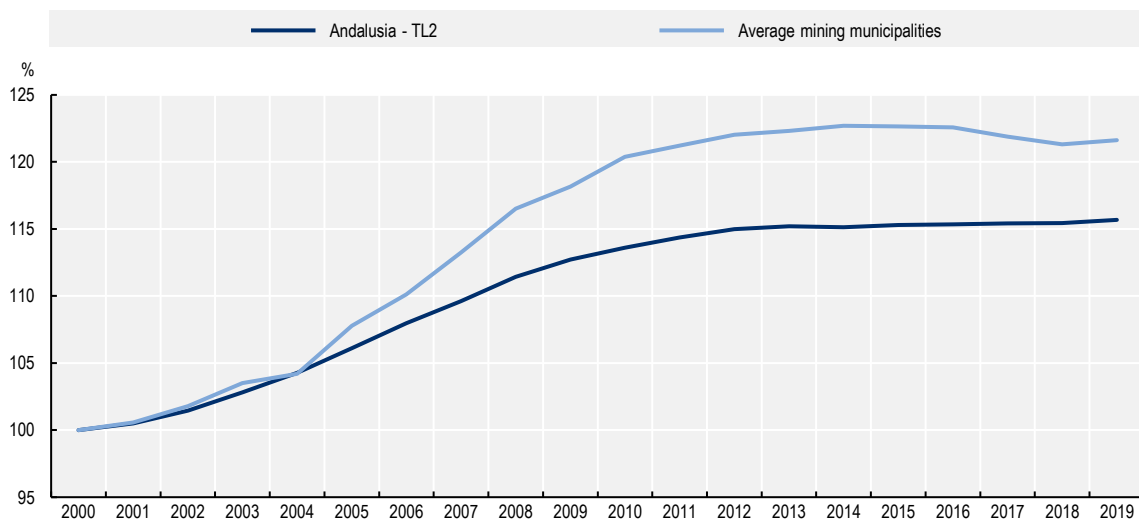
particularly to the large cities of Spain. In this context, the mining municipalities, due to their good economic performance, have seen their populations emerge and maintain high values compared to the rest of the region.

Mining has the potential to reduce demographic challenges in rural municipalities

The mining municipalities of Andalusia (see Table 2.4) have the capacity to retain the population (Figure 2.7). Data on demographic growth in mining municipalities of Andalusia are on average positive, reaching an accumulated population increase of 21.6% from 2000. A remarkable average value when compared to the regional average of Andalusia (14.7%), the province of Huelva (13.9%) and the national average (15.4%). Population in municipalities such as Salteras, Guillena and Gerena have grown by 80%, 52% and 38% respectively between 2000 and 2019. Other municipalities of Huelva with no mining activity and no known tourism destinations such as Niebla, San Bartolome de la Torre or Trigueros have registered growths of between 7% and 12%, significantly lower than the mining municipalities.

Overall, mining municipalities perform better than the provinces where they are located, with a prominent role in the fixation of the population in rural areas. The economic activity around mining and the employment generated from it is fundamental for the attraction of the working-age population to rural regions.

Figure 2.7. Population growth in cities and mining municipalities in Andalusia, 2000-19

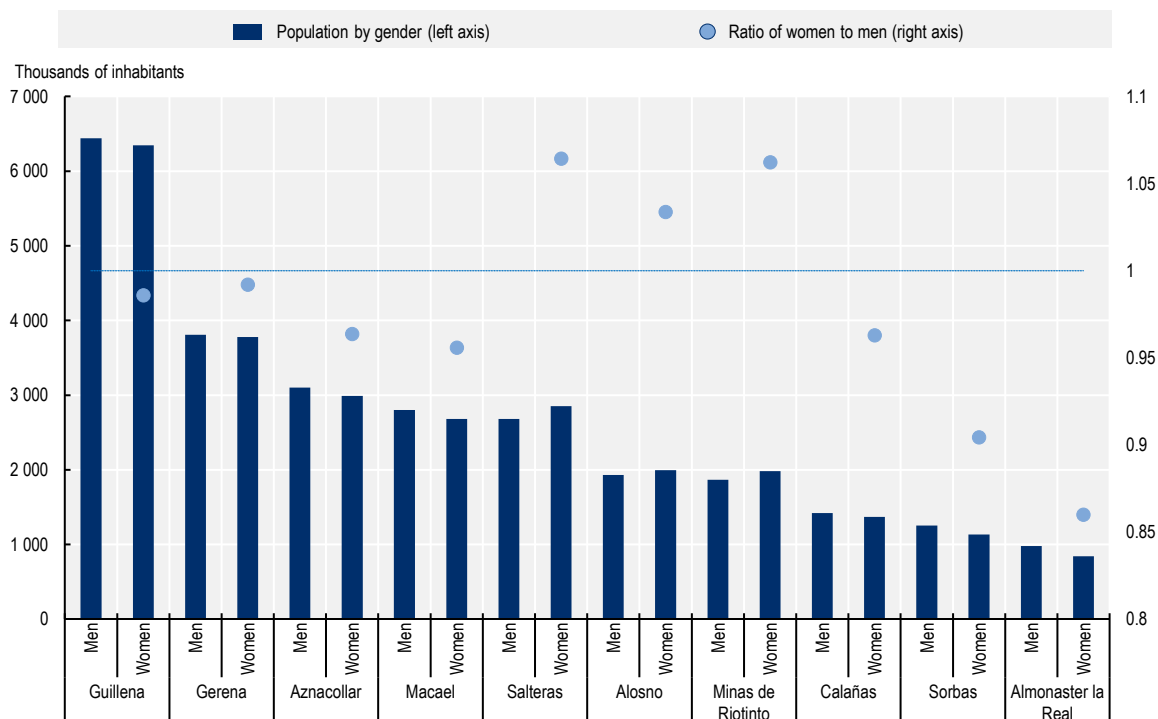


Note: 2000=100. Selected ten mining municipalities according to operating mines.

Source: Junta de Andalucía (2019^[18]), *Indicadores sociales de Andalucía*, <https://www.juntadeandalucia.es/institutodeestadisticaycartografia/indicadores/61.htm> (accessed on 10 November 2020).

Mining municipalities have a relatively sustainable gender balance

In terms of gender, there is one constant in almost all mining municipalities: overrepresentation in favour of men over women. The outstanding exceptions are Alosno, Minas de Riotinto and Salteras, which on average have more than 5% overrepresentation in favour of women. Elsewhere, the mining municipalities are on average 4% above men than women (2019), the cases of Almonaster la Real (85% women over men) and Sorbas (90.4%) being the most prominent (Figure 2.8). Adopting a specific approach to this aspect is of significant relevance when addressing demographic phenomena such as gender imbalance in order to establish sustainable communities over time.

Figure 2.8. Population of the ten selected mining municipalities of Andalusia by gender, 2019

Note: Ratio calculated as total male inhabitants over female inhabitants.

Source: Junta de Andalucía (2019_[18]), *Indicadores sociales de Andalucía*. <https://www.juntadeandalucia.es/institutodeestadisticaycartografia/ndsoc/indicadores/61.htm> (accessed on 10 November 2020).

In summary

Mining municipalities have a leading role in population fixing in rural areas as Andalusia's attractiveness as a region for other regions' population is declining. Solid economic growth, along with sufficient service provision – regardless of the region's rurality – is vital to establishing prosperous communities in the medium term. In addition, offering quality jobs and competitive educational programmes are fundamental for the younger population, which, while rooted in their region, may sacrifice opportunities if they choose not to migrate.

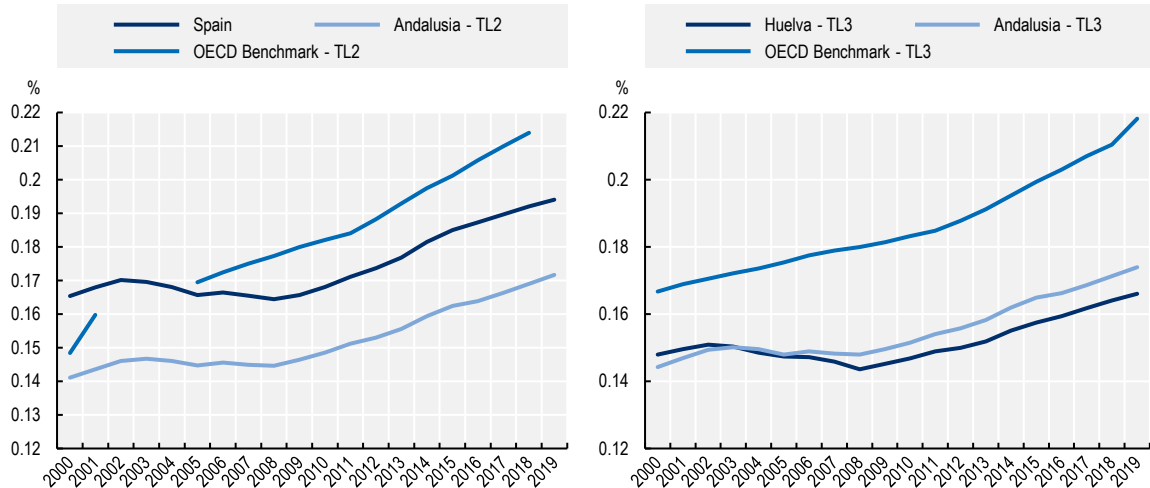
Andalusia has a demographic bonus but ageing is an increasing trend

Andalusia benefits from a demographic bonus with a relative low elderly dependency ratio compared to national and OECD benchmark levels. The regional elderly dependency ratio is below the levels of Spain and the OECD TL2 benchmark of mining regions (Figure 2.9). Likewise, in 2019, Huelva experiences a significantly lower elderly dependency (16.6%) than the national average (19.4%) and TL3 OECD benchmark (21.8%) with implications for the region's large working-age population as will be explained in the next section. The youth dependency ratio has also been relatively positive for Andalusia and Huelva in the last two decades, particularly with respect to the national average.

However, the slowdown of the population growth experienced between 2008 and 2015 had an impact on the youth and elderly dependency ratios of Andalusia, gradually mitigating the demographic bonus that the region still enjoys (Figure 2.9 and Figure 2.10). The youth dependency ratio is relatively positive for Andalusia but in the last decade, the gap has narrowed and equalled the OECD TL2 benchmark. Whilst in 2000 Andalusia had 26.15% and Huelva 25.84% of youth dependency ratio compared to a national

average of 21.6%, the gap has narrowed substantially in 2019 to 1.3% and 0.7% respectively. Regarding the elderly dependency ratio, all regions covered in the case study experienced increases over the last decade, yet at different rates. In 2019, Andalusia enjoys a substantial difference with respect to the national average of 2.2%, increasing to 2.8% in the case of Huelva. When comparing with the OECD TL2 and TL3 benchmarks, both Spanish regions stand out with gaps of 3.1% for Andalusia and 5.2% for Huelva. Overall, Andalusia benefits from a large working-age population as the next section will explore, resulting in a demographic composition sustainable over time.

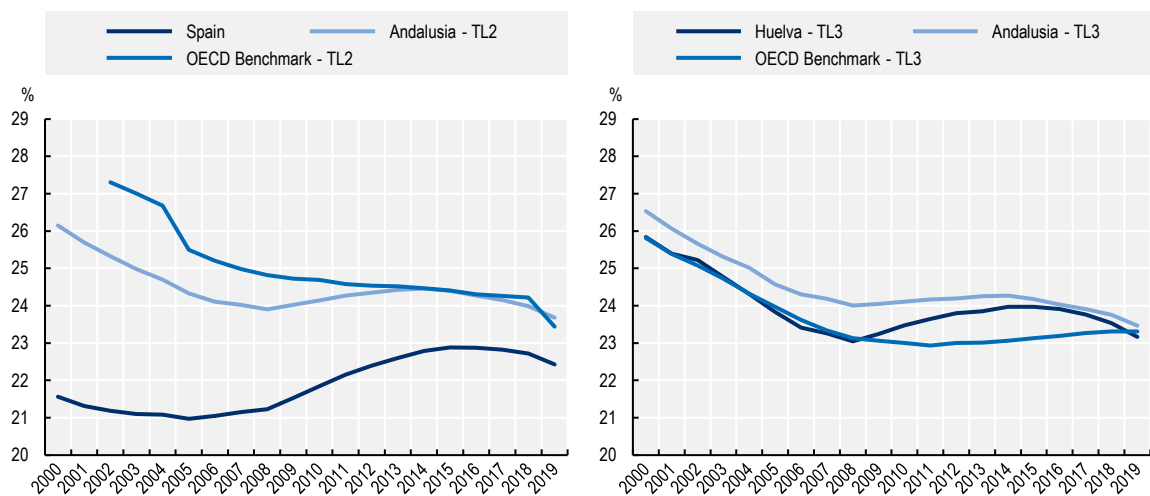
Figure 2.9. Elderly dependency ratio in Spain, Andalusia, Huelva, TL2, and TL3 comparable regions, 2001-19



Note: Calculated as a share of individuals over 65 years old over the working-age population (15-65 years old). There is a jump of years for the OECD benchmark TL2 due to lack of data from some regions.

Source: OECD (2021^[15]), "Regional demography", <https://doi.org/10.1787/region-data-en> (accessed on 27 January 2020).

Figure 2.10. Youth dependency ratio in Spanish TL2 and TL3 regions, 2001-19



Note: Calculated as a share of individuals 0-15 years old over the working-age population (15-65 years old).

Source: OECD (2021^[15]), "Regional demography", <https://doi.org/10.1787/region-data-en> (accessed on 27 January 2020).

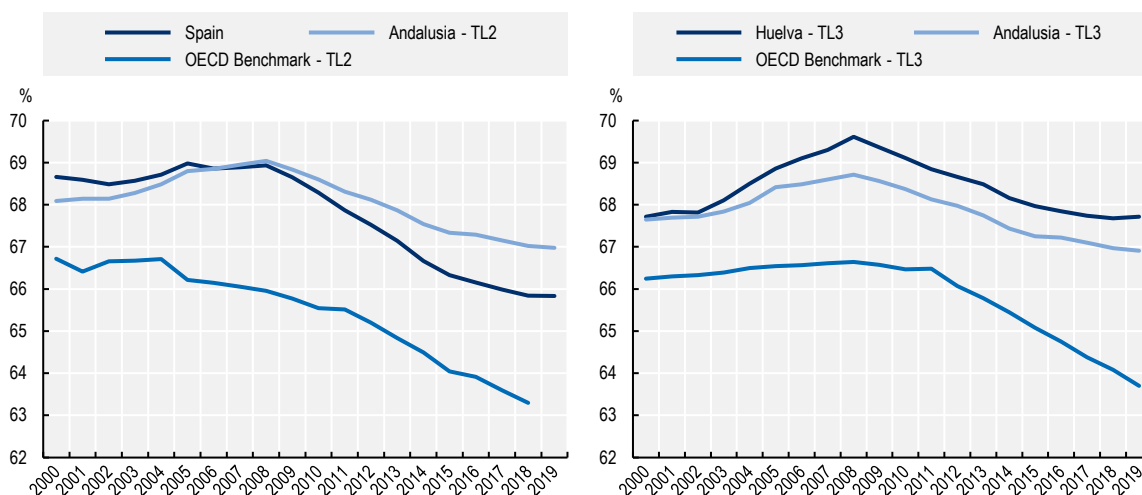
Andalusia has a large working-age population, although it is in decline

Andalusia has a large share of the working-age population compared to the national average and the OECD comparison (Figure 2.11). Both at the OECD TL2 and TL3 benchmark levels, there are substantial differences with the regions of study, which highlights the strength of Andalusia as a provider of labour force as long as the current trend is not negatively accentuated and sustainable levels are recovered.

The relatively positive comparison of Andalusia and Huelva with the OECD TL2 and TL3 benchmark is blurred by the fact that the ageing population (Figure 2.9) is increasingly reducing the workforce in the region. The financial crisis directly affected the working-age population share of the region. While in 2008, the regional share of Andalusia was very similar to the figure of Spain, 69.0% and 68.9% respectively. Andalusia's share since then suffered a change in trend and began to fall, more sharply than the national average. The difference in the working-age population between Andalusia and the OECD TL2 benchmark widened, reaching a maximum gap of 3.7% in 2019, the latest data available. At the TL3 level, Huelva has a share of the working-age population above the level of Andalusia and far above the level of the OECD TL2 benchmark of mining. In 2019, the share of the working-age population of Huelva (67.7%) was 0.8 perceptual points above the level of Andalusia (66.9%). Such supply of labour force is one of Huelva's strengths that can be mobilised to attain provincial prosperity. This is partially explained by the strong impact that the crisis had on unemployment and its repercussion on the emigration of the youngest part of the labour market to other regions in Spain and countries of the EU.

The region faces a trend towards a small and declining workforce, which is not only a challenge to the sustainability of the region's current economic activity but also hinders the growth of new businesses and the financial income of local municipalities (see Chapter 3).

Figure 2.11. Working-age population in Spanish TL2 and TL3 regions, 2000-19



Note: Share of the working-age population (15-64 years old) over the total population.

Source: OECD (2021^[15]), "Regional demography", <https://doi.org/10.1787/region-data-en> (accessed on 27 January 2020).

In summary

Andalusia has a strong workforce as its population is young, standing out from comparable OECD regions. In particular, the province of Huelva is significantly above the TL3 benchmark for mining regions and this characteristic is one of Huelva's strengths for future prosperity. However, an ageing and shrinking workforce has accompanied recent years of stagnant population growth. As a result, the scenario is

prosperous for the region of Andalusia, whereas it is important to capitalise on the demographic bonus by mobilising the labour force – particularly youth – to contribute to the labour market.

Table 2.6. Summary of demographic trends of Andalusia and its mining regions

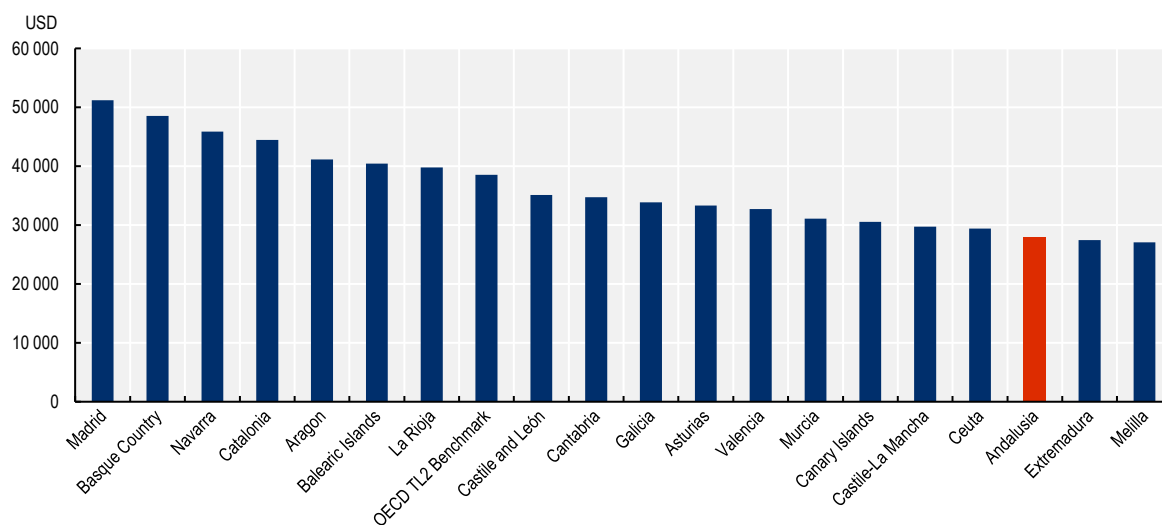
	Spain, Andalusia and OECD TL2 benchmark	Huelva, Andalusia and OECD TL3 benchmark	Mining municipalities of Andalusia
Population distribution	The region of Andalusia concentrates the largest share of the population (17.8%) of Spain along with its 106 municipalities.	Huelva has 524 576 inhabitants, the lowest share of the population (6.2%) among the provinces of Andalusia. A quarter of its population is concentrated in the provincial capital (city of Huelva).	Mining municipalities have a relatively small size of between 2 and 12 000 inhabitants. These mining municipalities have a relatively sustainable gender balance (2.2% overrepresentation in favour of men).
Population growth	The population growth experienced since 2000 slowed down at the same time as the economy due to the 2008 crisis. By 2019, Andalusia had accumulated 15.1% growth since 2001, significantly higher than the OECD TL2 benchmark (6.2%) Although the inflow population sustained demographic growth in the period leading up to the crisis, the trend has changed. In the last decade, outmigration became one of the main population outflows in the region.	Huelva's growth in the last three years has managed to accelerate again, mainly due to the attractiveness of the mining municipalities. Overall, during the period 2000-19, Huelva maintained a growing pace, unlike the OECD TL3 benchmark. Huelva, like the rest of the region, is suffering from outmigration of the youngest population (15-29 year-olds) to the largest cities of the region and the country (Barcelona and Madrid) due to educational and labour opportunities.	The mining municipalities have grown in population significantly above the rest of the region (22% vs. 16% since 2000). The constant increase in work in the mining sector has brought people of working age to the mining municipalities. While in 2008 there were 359 people dedicated to mining activities, in 2018 it grew to 3 770.
Ageing population	Andalusia enjoys a demographic bonus for a large young population of working age. Although the elderly and youth population experiences positive values in the region (17.1% and 23.7% in 2019), the recent trend shows that this advantage diminishes.	Huelva has a high working-age population. The province has a relatively lower ratio of elderly and similar youth to the OECD TL3 benchmark, although the trend tends to reduce this advantage.	

Regional economic trends

Andalusia, a low-income region whose convergence with national levels is on the horizon

Andalusia is the Spanish region that provides the third greatest contribution to the national GDP. With 18% of the Spanish population, Andalusia's economy contributes to 13.3% of the national GDP. This gap translates into a low level of income per capita in the region, the third-lowest in Spain (USD 27 922), just after Melilla (USD 27 092) and Extremadura (USD 27 446) (Figure 2.12). Likewise, Andalusia's GDP per capita (USD 29 922 in 2018) is far below the level of the OECD TL2 benchmark of mining regions (USD 38 774).

Figure 2.12. GDP per capita of TL2 regions of Spain compared to OECD TL2 benchmark, 2018



Note: GDP per capita measured in USD per capita, constant prices, constant purchasing power parity (PPP) and base year 2015.
 Source: OECD (2021^[15]), "Regional demography", <https://doi.org/10.1787/region-data-en> (accessed on 27 January 2020).

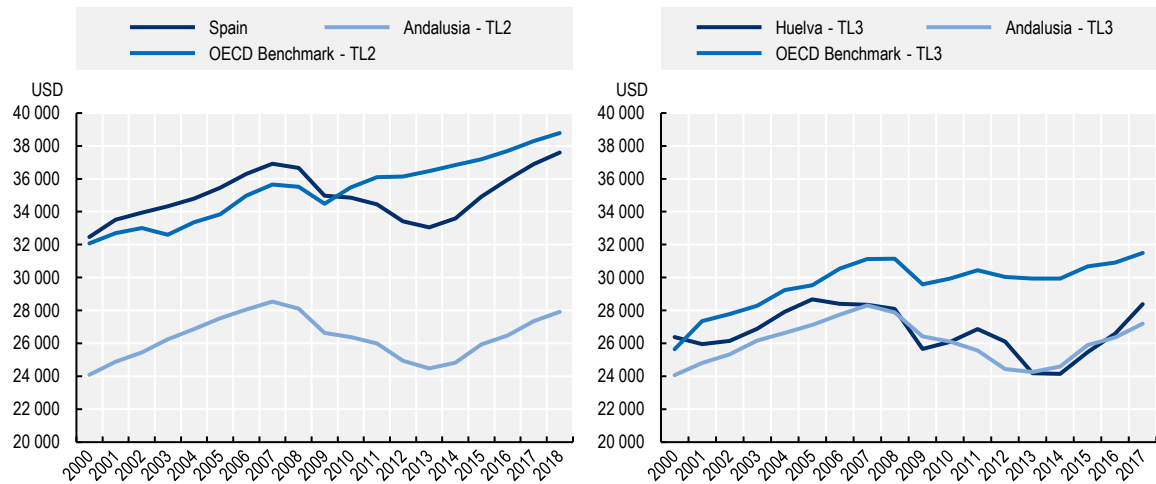
Andalusia's GDP recorded higher growth rates at the beginning of the 2000s but was hardly hit during the crisis. In the period prior to the financial crisis, the economy of Andalusia experienced a constant acceleration (2.4% annual average), slightly higher than the rest of the country (1.9%) and the OECD TL2 benchmark of regions (1.5%), driven mainly by the peak of sectors such as construction and services. However, the region was hit hard by the 2008 crisis, experiencing a sharp fall, which places it among the TL2 regions of Spain with the largest 2007-09 drop (-1.7% annual average).

In the post-financial crisis era, the economy recovered and as of 2017 was at higher levels than before the financial crisis (Figure 2.13). Mining expansion has been one of the factors supporting such recovery, with a value of mining production that doubled in the last 2 decades (from 0.28% to 0.57% of total GDP).

At the TL3 level, Huelva has shown positive economic performance in the context of Andalusia, while below the OECD TL2 benchmark. At the beginning of the 2000s, Huelva suffered a drop in GDP partly due to the slowdown in mining activity, which led to decoupling from the OECD TL3 benchmark's GDP per capita levels. After a short period of recovery, the arrival of the financial 2008 crisis coupled with the fall in the price of minerals led Huelva to experience a sharp drop in its GDP. Since the years after the crisis, the following rise in mineral prices supported the relaunch of the mining activity in Huelva. From 2016, Huelva stood out in GDP per capita values at slightly higher levels than the Andalusian region and its growth rate is closing the gap with the OECD TL2 benchmark.

The region has not been able to maintain a sufficient economic performance to close the structural gap with the national average (Figure 2.14). The gap between the GDP per capita of Andalusia and Spain has increased over the years (from USD 8 372 per capita in 2000 to USD 9 673 in 2018). While Andalusia was able to close the gap in the period previous to the 2008 financial crisis, the crisis had a greater impact on Andalusia's economy, which has not been able to recover since. By 2018, Andalusia's GDP per capita was 74.3% of the national average and 54.5% of the capital region Madrid. A deindustrialisation process along with an economy highly reliant on construction and seasonal activities (as will be explored in the following sections) has been a burden for the recovery of Andalusia relative to the national trend. In the context of the COVID-19 crisis, it is relevant to conduct strategies to avoid this crisis further expanding the income gap at the national level.

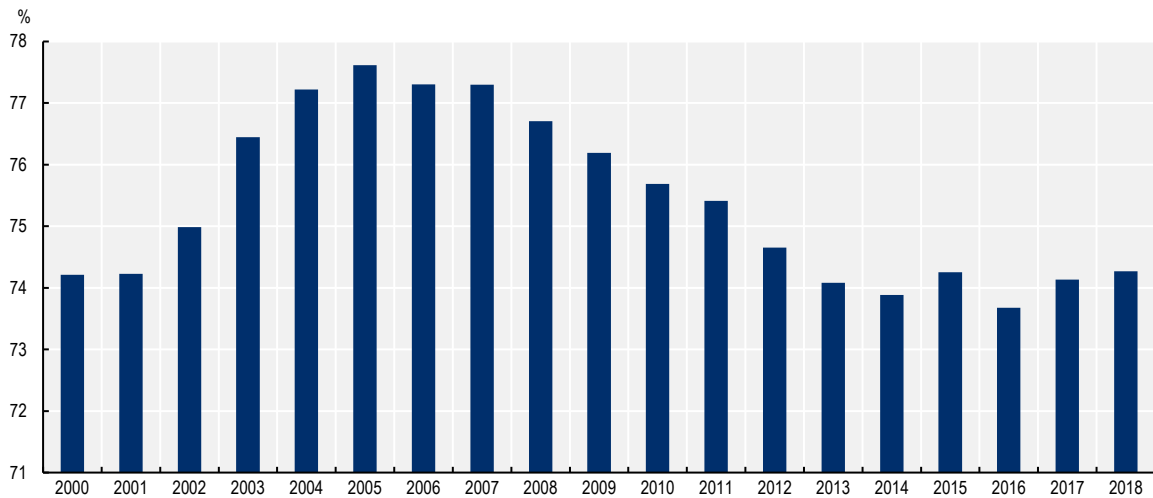
Figure 2.13. GDP per capita trend in Spanish TL2 and TL3 regions, 2000-18



Note: GDP per capita measured in USD per capita, constant prices, constant PPP and base year 2015.

Source: OECD (2021^[15]), "Regional demography", <https://doi.org/10.1787/region-data-en> (accessed on 27 January 2020).

Figure 2.14. Gap of GDP per capita between Andalusia and Spain, 2000-18



Note: The gap has been calculated as the share of GDP per capita of Andalusia in comparison to Spain.

Source: OECD (2021^[15]), "Regional demography", <https://doi.org/10.1787/region-data-en> (accessed on 27 January 2020).

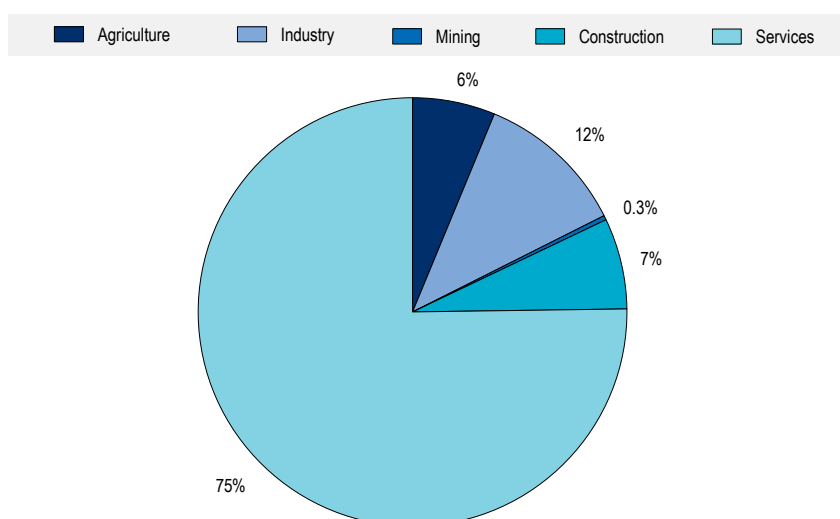
In summary

Andalusia has grown but has not converged with the rest of the country. Despite the progress made in the social and economic fields, the imbalance with the rest of Spain remains and this region has not managed to climb up the various regional competitiveness levels. Beyond their contribution to the generation of wealth and employment, productive activities linked to rural areas are an essential element for territorial cohesion and balance in Andalusia, which has slowed down the inertia of depopulation.

Strengthening the industry to bridge the structural gap with Spain

Andalusia has an economy highly dependent on low value-added service activities. The service sector is the leading economic activity in the region (75% of regional GDP in 2019), followed by industry (11.6%), agriculture (6.2%) and construction (6.8%) (Figure 2.15). The service subsectors with the greatest weight in the economy are wholesale trade and retail trade³ (31.5% of total services). Many of the activities of the service are linked to tourism, a sector that has maintained a growing pace thanks to the region's international attractiveness and whose contribution to the GDP (measured through its associated revenues across all related activities) accounts for a slightly higher share (12.8%) than the level of industry (Junta de Andalucía, 2017^[19]). In fact, the contribution of construction has also been partially linked to the demand for tourism facilities (hotels, secondary houses). While the mining sector represents a relatively lower share of the GDP, its associated activities, linked to industry, construction and services should be better measured to account for the entire contribution of mining to the GDP.

Figure 2.15. Sectoral GDP contribution to the total regional GDP of Andalusia, 2019



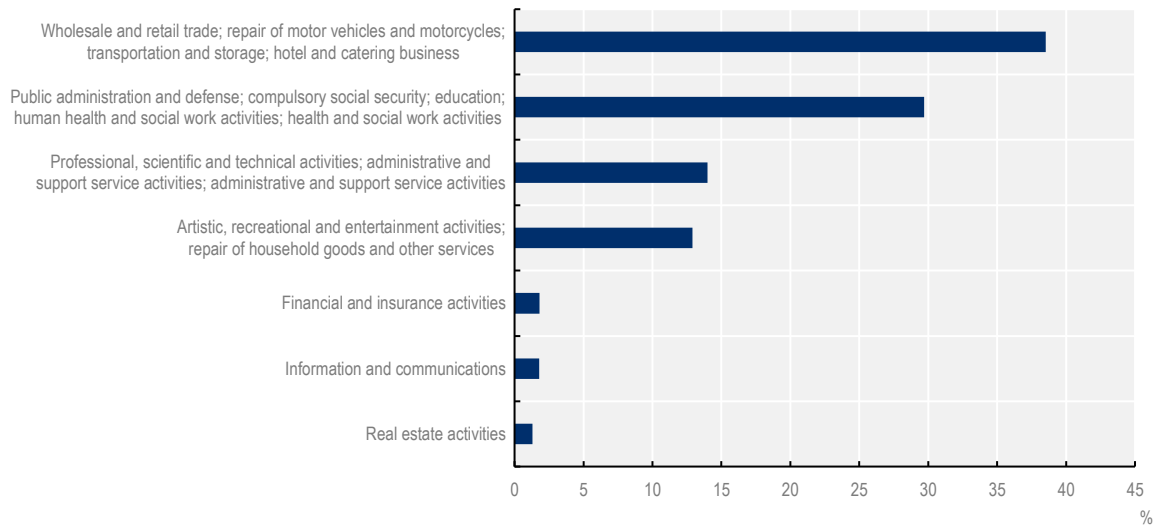
Note: Industry data includes manufacturing and mining data is from 2018, denominated under the category of extractive industries.

Source: IECA (2019^[20]), *El Mercado de Trabajo en Andalucía. Datos estructurales*, <https://www.juntadeandalucia.es/institutodeestadisticaycartografia/merctrab/mtInd03.htm> (accessed on 5 October 2020); Annual Regional Accounting of Andalusia (Instituto de Estadística y Cartografía de Andalucía, 2020^[21]).

Tourism has thus contributed to the skewed development of associated low-value-added service activities. The breakdown of the service sector reveals the importance of trade, hotels and restaurants, which are essential to the tourism sector (Figure 2.16). The second and third most representative services are public administration – including education, health and social services – (28.4%) and real state (17.6%). In contrast, services with a higher added value such as financial services or information and communications have only a 4.3% and 2.5% weight over the total service of the region.

This strong dependence on the services sector, which is also highly – seasonal, particularly in the case of those associated with tourism, has led to economic fluctuations in periods of uncertainty, with direct impacts on regional unemployment rates. This seasonality of the Andalusian economy has contributed in part to the structural gap against national levels, holding back the region's economic growth at higher rates.

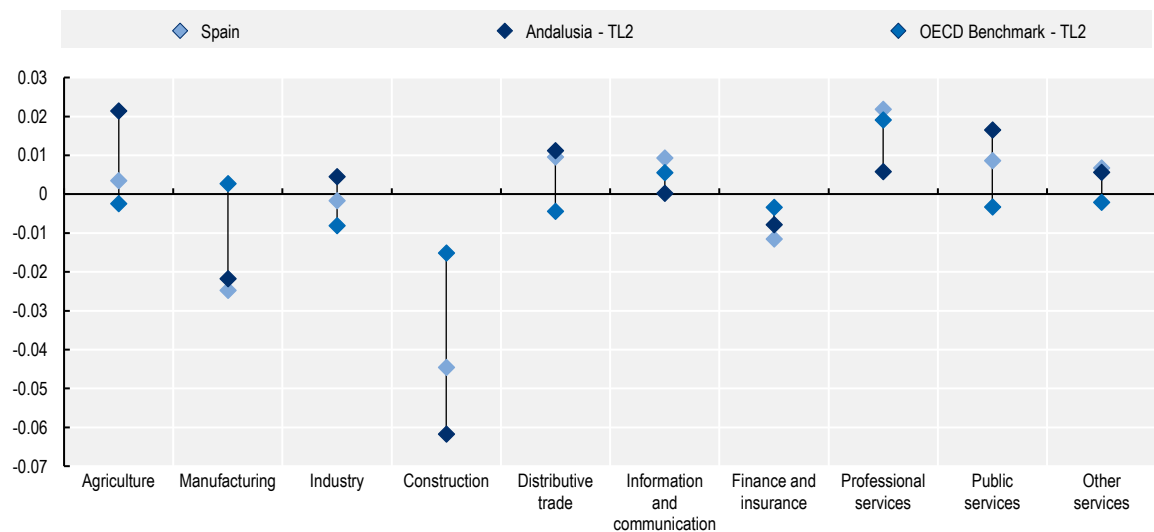
Figure 2.16. Share by type of service over total services in Andalusia, 2019



Source: IECA (2019_[20]), *El Mercado de Trabajo en Andalucía. Datos estructurales*, <https://www.juntadeandalucia.es/institutodeestadisticaycartografia/merctrab/mtInd03.htm> (accessed on 5 October 2020); Annual Regional Accounting of Andalusia (Instituto de Estadística y Cartografía de Andalucía, 2020_[21]).

During the financial crisis, Andalusia underwent slow industrialisation in favour of other sectors such as the tertiary and agricultural sectors (Figure 2.17). Therefore, the agricultural sector and the agri-food industry (which includes mining) are the backbone of regional economic activity, especially in rural areas, thus representing a total of a quarter of Spanish agri-food exports. Together with tourism (not broken down as an individual activity in Figure 2.17 due to its multi-sectoral nature), both are the pillar of the region's production system.

Figure 2.17. Change in GVA share, by sector in Spain, Andalusia and OECD TL2 benchmark, 2005-17

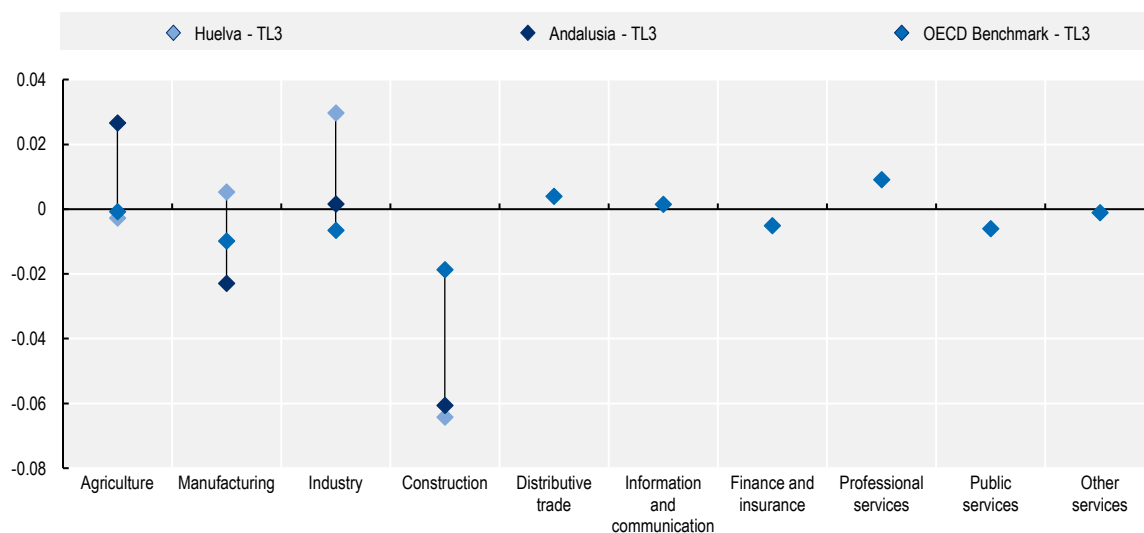


Note: The category Industry contains mining sectoral activities.

Source: OECD (2021_[15]), "Regional economy", <https://doi.org/10.1787/region-data-en> (accessed on 27 January 2020).

At the TL3 level, as observed in Figure 2.18, the trends are even. While the construction sector suffered the largest drop of all economic sectors (6% for Andalusia and OECD TL3 benchmark and 3% for Huelva), the industry sector took off with a significant increase partly due to mining (3% in the period from 2005 to 2017).

Figure 2.18. Change in GVA share, by sector, Andalusia, Huelva and OECD TL3 benchmark, 2005-17

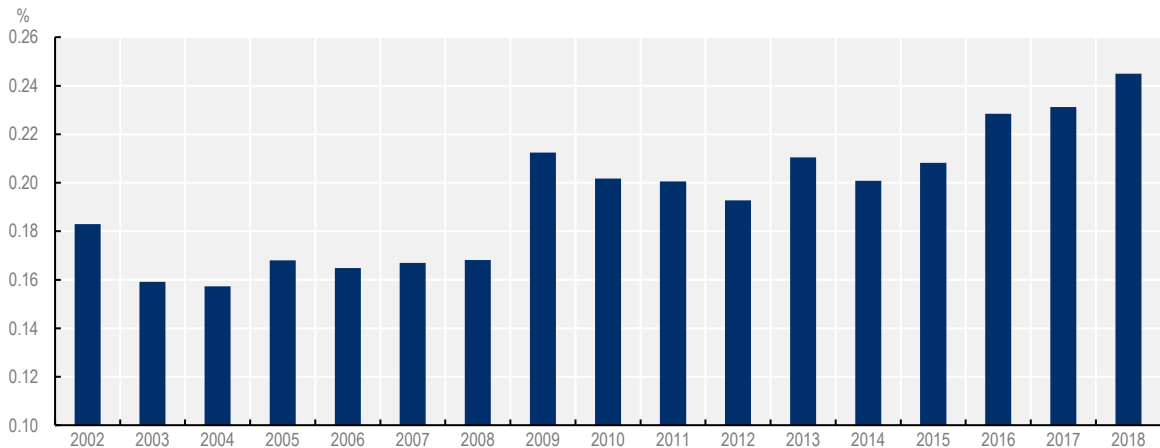


Note: No data availability for Huelva and Andalusia for six sectors. The category Industry contains mining sectoral activities.
Source: OECD (2021^[15]), "Regional economy", <https://doi.org/10.1787/region-data-en> (accessed on 27 January 2020).

Mining an engine for Andalusia's economic recovery

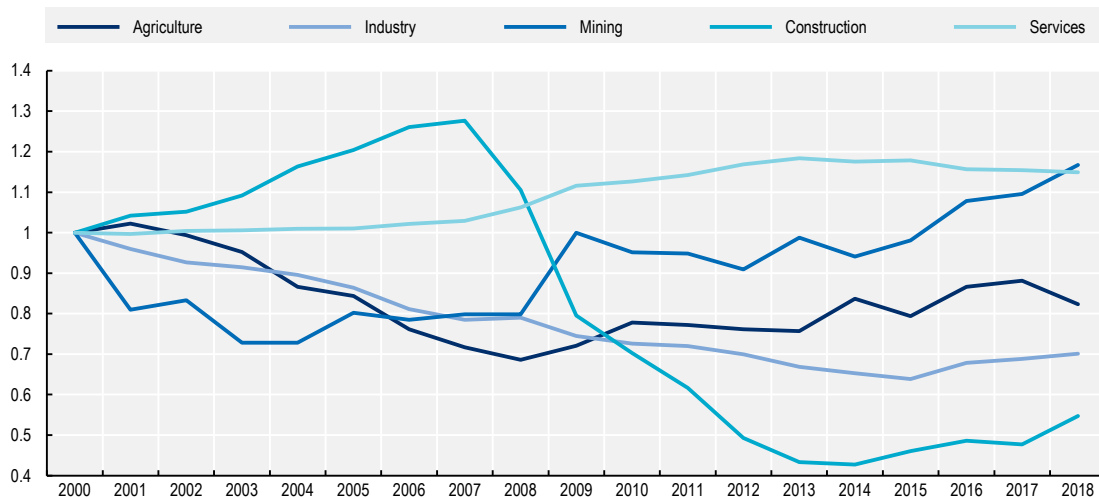
Mining has supported the positive growth of the industry in the region. During the period 2005-17, industry's GVA grew (0.4%), unlike the country (-0.2%) and the OECD TL2 benchmark (-0.8%). This performance coincides with the reactivation of mining activity in Andalusia, being decisive due to its relative weight on exports during the region's recovery process after the financial crisis. Indeed, starting in 2009, international copper prices grew substantially reaching a peak in 2011 (4.48 USD per pound) and tripling the value of 2000 at present. In parallel, the volume of Andalusian mining exports has grown by 187% since 2008, almost 3 times the value of its exports, to reach EUR 5 697 million in 2018. Over the years, Andalusia has progressed from being the fourth largest exporter in 2009, with 13.8% of the total, to consolidate its position as the leading exporter in 2018 with 20.5%, overtaking the Basque Country, Valencia and Catalonia, leading national exports in 2018 and becoming the top 10 exporters in this period. As a whole, Andalusia is consolidated as the second-largest exporting region in Spain. Huelva, in particular, remained the leading province in terms of exports' value, representing 22.4% of Andalusia's total exports.

Overall, the mining dynamic has boosted the contribution of the sector not only to the economy but also to the total employment of the region (see Figure 2.19). Therefore, the share of employment in the mining sector over the total regional employment almost doubled during 2002-18, reaching values of 0.25% in 2018. This sector increased its levels of employment, particularly after the 2008 crisis. Moreover, metallic mining is concentrating the highest growth within the subsectors of Andalusian mining. In fact, this subsector represents the only increase of employment in mining during 2009-16, by doubling its number of employees. Within non-metallic mining, trends are different. While employment in industrial mining decreased at regional employment levels (-2.3% compared to a -3.8% decrease of the total regional employment), the other two subsectors experienced more significant drops: quarry products (-37.2%) and ornamental rocks (-25.9%).

Figure 2.19. Share of employment in the mining sector over total employment of Andalusia, 2000-18

Source: INE (2020^[8]), *Estadística sobre actividades de I+D. Año 2019*, https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736176754&menu=ultiDatos&idp=1254735576669 (accessed on 12 November 2020); Spanish Government (2018^[12]), *Estrategia Minera Nacional* from 2000 to 2018.

Such trend of job creation in mining has overpassed the dynamic in other sectors, including industry, construction and agriculture. In fact, these sectors experienced a gradual decrease in job creation, in favour of sectors such as mining and services (see Figure 2.20). This dynamic reveals that the mining sector can become a tool to attain sustainable job opportunities in the region and create more sustainable incomes. This phenomenon is increasingly relevant in the current scenario due to the economic crisis that is looming because of the COVID-19 health crisis. Moreover, copper prices have increased considerably in 2020 compared to 2019 (25.8%), showing a substantial opportunity for the Andalusian mining sector unlike the majority drop in other economic sectors. The countercyclical nature of the mining activities, particularly metallic mining, may lead the region to a faster recovery.

Figure 2.20. Growth of employment by economic sector, 2000-18

Note: 2000=1.

Source: IECA (2019^[20]), *El Mercado de Trabajo en Andalucía. Datos estructurales*, <https://www.juntadeandalucia.es/institutodeestadisticaycartografia/merctrab/mtInd03.htm> (accessed on 5 October 2020); Annual Regional Accounting of Andalusia (Instituto de Estadística y Cartografía de Andalucía, 2020^[21]).

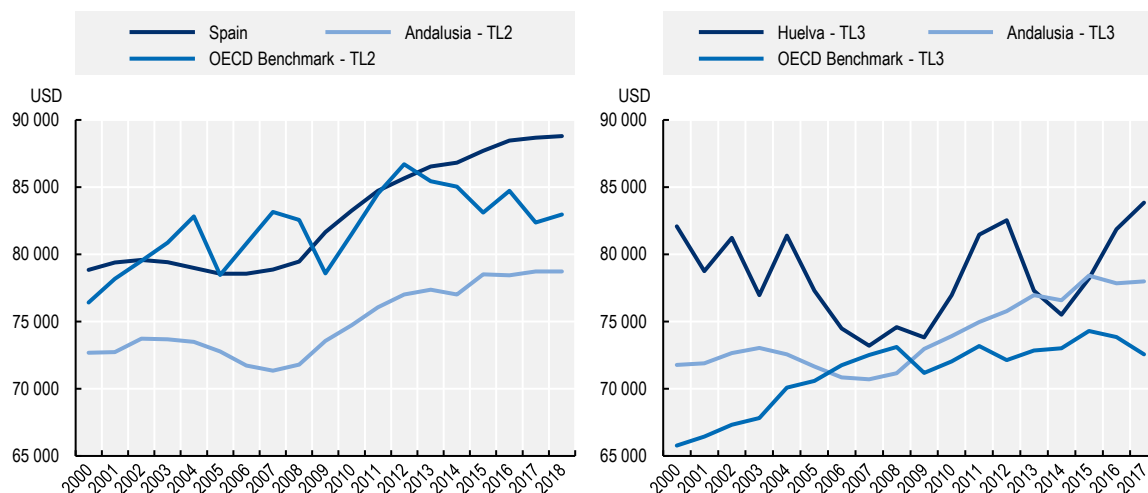
Productivity as an enabler of growth

A fundamental factor that has a positive impact on wages, employment, equality and ultimately well-being is productivity. Andalusia has raised its productivity levels over the last two decades (Figure 2.21). However, it remains below the national average and the OECD TL2 benchmark. This is due to several factors, including low labour force education, innovation (see Chapter 3), productivity and company size, all of which are hampering Andalusian growth.

Overall, the increase in productivity is not so much due to advances in innovation, or the economic structure of the region but rather to a correction of the market by adjusting the values. As one of the limiting causes of rising productivity, the atomisation of companies does not allow for an agglomeration of economies that would generate synergies to increase regional productivity. Ornamental mining is experiencing an agglomeration bottleneck, as will be explored in Chapter 3. To reach levels of education similar to the rest of the country, there must be an increase in public-private partnerships in innovation investment, as well as support for the creation of companies and their growth, indispensable pillars to sustain a growth of productivity in the medium term.

In 2018, productivity in Andalusia was USD 78 720, an increase of 8.3% over 2000 levels. Although growth has been relatively constant – aside from the initial period of the financial crisis –, the reality is that the structural gap with the rest of the country has not allowed the difference to be reduced. In the last available data (2018), Andalusia's productivity was 11.4% below the national average and 5% below the OECD TL2 benchmark. As a result, the autonomous community of Andalusia ranks 14th among the 17 autonomous communities. As will be explored in Chapter 3, the mining sector brings extensive innovation and can foster the technological development of the region. Working to unite the productivity of these highly technological sectors with other drylands is one of the main challenges to promote regional development.

Figure 2.21. Labour productivity trend, 2000-17



Note: Productivity measured as the GDP over the total workforce.

Source: OECD (2021^[15]), "Regional economy", <https://doi.org/10.1787/region-data-en> (accessed on 27 January 2020).

In summary

Andalusia's productivity is increasing but has not yet converged with the rest of the country. The high dependence of its economy on the service sector may aggravate the effects of COVID-19 over time since the high seasonality of the sector has made it one of the first to be the most affected by the global slowdown. The spearhead has been tourism, where the reduction of visitors and derived income has implied a significant impact on regional economy. Its fast recovery in productivity, to the detriment of employment, emphasised a market correction of the phenomenon. That rapid rise was the preamble to a recovery that continues to this day, with current ongoing uncertainty about the final impact of the COVID-19 crisis on country economies. Taking advantage of the region's strengths to equitably increase employment and economic performance while boosting structural productivity will be key to meeting the challenges of the present and future.

Unlocking the labour force potential through a strong labour market

The Andalusian labour market is relatively weak in the OECD and country context, with high rates of informal labour. While this informality offers the benefits of avoiding the burden of regulation and taxation, its participants suffer the cost of not having access to the protection services of the law that the state offers (Loayza, 2016^[22]). Misallocation of resources and loss of the advantages offered by a robust legal framework or others such as access to international markets and slow migration to more productive areas, are characteristics of the informal labour market. The result is a weak labour market, with poor quality contracts that ultimately result in low economic growth (Loayza, 2016^[22]).

As explored in previous sections, the Andalusian economy is based on agriculture and the service sector. Seasonal economic activities such as agriculture and particularly tourism – as part of the service sector – have led to a temporary labour culture, characterised in general by short “contracts”, low wages and little legal protection. Among other indicators, informality can be measured by the elasticity between employment and GDP. In 2019, Andalusia was the Spanish region with the largest submerged economy, while Huelva was leading the region, partly because of its high specialisation in agriculture. The total number of employed people in the province of Huelva in 2017 was estimated at 226 048, of which 183 475 were in declared jobs and the rest were the result of the underground economy (CESpH, 2018^[23]). Chapter 4 will explore mining branding and the positive effects of mining in the region where it is located, with low rates of informality in the mining sector, particularly in the metallic mining sector. This is a positive aspect in a context where informality is present partly due to temporary economic activities such as agriculture which, as explained in this section, can lead to higher rates of informality.

Seasonal employment harms the quality of work in the region of Andalusia

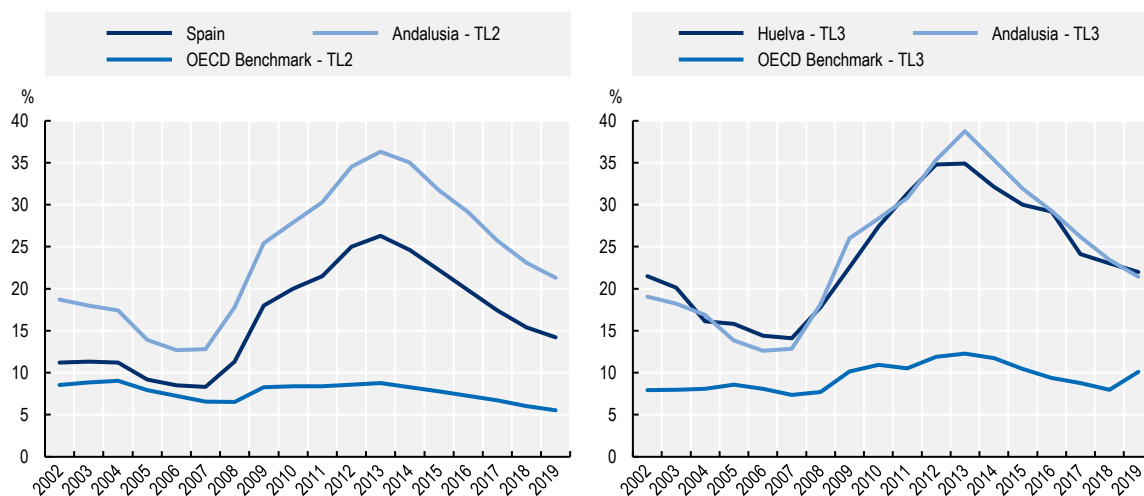
The seasonality of the Andalusian economy has led to consistently high unemployment rates over time, resulting in a structural gap with the rest of the country. In 2018, practically 1 out of every 5 Spanish unemployed was Andalusian (21.3%) (see Figure 2.22). During the economic expansion phase linked to the real estate boom, the gap with the rest of Spain in a period of economic expansion did not fall from double digits (12.8% in Andalusia vs. 8.3% in Spain), resulting in implications for the quality of the Andalusian labour market.

As explored in previous sections on the economic performance of Andalusia, the seasonality of its economic activity has a direct implication on the quality of the labour market. Weak labour market as well as an atomised business demography, mainly made up of SMEs as will be seen in the following section, impairs the structure of Andalusian employment. A further reason that is slowing down Andalusia's progress in terms of unemployment is the reduced mobility of the labour market. There is no such direct correlation between geographic locations where work is present and the displacement of the unemployed

working-age population towards those areas. As a result, this potential labour demand is limited to other regions.

Mobilising all of the young people who currently neither study nor work, estimated at 253 200 in Andalusia in 2019 (INE, 2019_[24]), is vital to revitalising the economy and the labour market (Figure 2.23Figure 2.22). Absorbing this young workforce and generating value from it are fundamental to maintain the demographic bonus characteristic of the region and to cut the structural gap with the rest of the country.

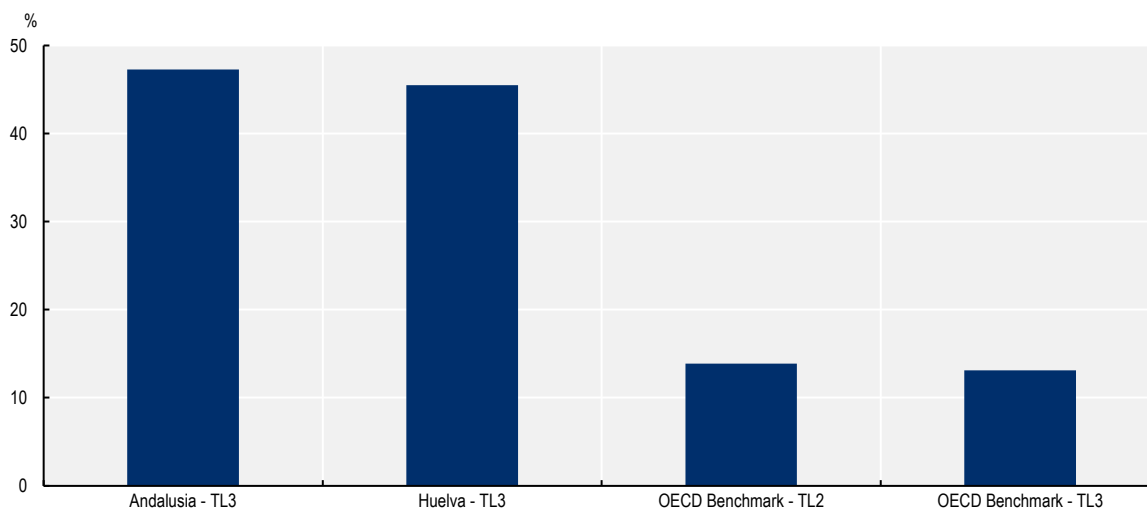
Figure 2.22. Unemployment rate over labour force in Spain, Andalusia, Huelva and comparable TL2 and TL3 regions



Note: Percentage of unemployed population over labour force 15-64 years old.

Source: OECD (2021_[15]), "Regional labour", <https://doi.org/10.1787/region-data-en> (accessed on 27 January 2020).

Figure 2.23. Youth unemployment rate, 2005-19



Note: Percentage of young unemployed population (15-24 years old) over labour force (15-64 years old).

Source: OECD (2021_[15]), "Regional labour", <https://doi.org/10.1787/region-data-en> (accessed on 27 January 2020).

Table 2.7. Summary of economic trends of Andalusia and its mining municipalities

	Spain, Andalusia and OECD TL2 benchmark	Huelva, Andalusia and OECD TL3 benchmark	Mining municipalities of Andalusia
Overall economic performance	<ul style="list-style-type: none"> Andalusia has grown economically, but the structural gap with Spain has not been reduced. It ranks as the 3rd TL2 region in Spain with the lowest GDP per capita in 2018. During the period 2000-18, Andalusia increased its GDP per capita by 15.9% (27 922 in 2018), which represents an accumulated increase equal to that of Spain and slightly less than the reference (20.8%). In the same period, Andalusia's productivity grew in line with GDP, reaching USD 78 720 in 2018, an increase of 8.3% over the levels of 2000. 	<ul style="list-style-type: none"> Huelva has shown positive economic performance in the context of Andalusia, although with irregular growth rates and seasonal drops in GDP. Between 2014 and 2017, Huelva stood out in terms of per capita GDP values, starting at levels slightly lower than those of the Andalusian region and rising to a level 4.3% higher, partly due to increased mining activity. 	<ul style="list-style-type: none"> The mining communities have experienced a period of prosperity since mining activities recovered after the crisis. The growing mining sector, which already represents more than half of the Andalusian mining sector, has grown steadily in economic and employment terms over the last decades.
Economic sectoral distribution	<ul style="list-style-type: none"> The agricultural sector and the agri-food industry are the backbone of regional economic activity. However, the growth of the Andalusian economy over the last decade has relied strongly on mining products exports. Overall, Andalusia is gradually becoming less industrial and more dependent on stationary sectors has meant fluctuations for the whole economy. In 2019, the sectoral composition of Andalusia's GDP was highly dependent on the service sector (74.1%), followed far behind by industry (11.6%), agriculture (7.7%) and construction (6.7%). 	<ul style="list-style-type: none"> Huelva in 2015 had a great dedication to seasonal sectors, such as agricultural products (4.4% participation of Andalusia) followed by industry (1.7%). Between 2005 and 2017, the construction sector suffered the biggest fall of all economic sectors (6% for Andalusia and the OECD TL3 benchmark and 3% in Huelva). In the same period, the industry sector took off with a significant increase due to mining (3% in the period of 2005 to 2017). 	
Labour market	<ul style="list-style-type: none"> The seasonality and low skill levels of the jobs largely explain the structural unemployment in the region. The seasonal labour market is dependent on services, tourism and agriculture, leading to higher rates of labour informality. In 2018, practically 1 out of every 5 unemployed Spaniards was Andalusian (21.3%) and 2 532 000 young people were neither studying nor working. The reduced size of the companies (97.7% of companies had fewer than 20 employees) is limiting the capacity to absorb labour. 	<ul style="list-style-type: none"> In 2019, Huelva was the province of Spain with the largest submerged economy, partly because of its high specialisation in agriculture. Mining has grown and along with it the associated employment in Huelva. From representing 27% of mining employment in Andalusia in 2000 to 51% in 2018. 	<ul style="list-style-type: none"> Employment in mining municipalities has continued to grow over the last two decades. If in 2000 there were 5 152 employees in the mining industry in Andalusia, in 2018 the figure rose to 7 424.

Well-being of the region of Andalusia

Snapshot of quality of life in Andalusia

Progress in the region and development of its business environment are relevant to ensure well-being in Andalusia. Retaining and attracting people and businesses are some of the aspects which depend directly on policies aimed at the well-being of the citizen. This is partly achieved by offering sufficient high living standards to make the region attractive to both foreigners and locals. The OECD's regional well-being analysis provides a tool for policymakers to assess the region's strengths and weaknesses, monitor trends and compare their results with those of other regions, nationally and internationally (Box 2.2). To better understand the relationship between well-being and mining regions, the analysis presented in this section adopts the OECD regional welfare framework to compare quality of life outcomes in Andalusia with the average for OECD TL2 mining regions and the average for Spain.

Box 2.2. OECD Regional Well-being Indicators

Building comparable well-being indicators at a regional scale

The OECD framework on measuring regional well-being builds on the OECD Better Life Initiative at the national level. It goes further to measure well-being in regions with the idea that well-being data are more meaningful if measured where people experience it. Besides place-based outcomes, the framework also focuses on individuals since both dimensions influence people's well-being and future opportunities.

In line with national well-being indicators, regional well-being indicators concentrate on informing about people's lives rather than on means (inputs) or ends (outputs). In this way, policies are directed to well-being features that can be improved by policies. Regional well-being indicators also serve as a tool to evaluate how well-being differs across regions and groups of people.

Regional well-being indicators are multi-dimensional and include both material dimensions and quality of life aspects. They also recognise the role of citizenship, institutions and governance in shaping policies and outcomes.

Although well-being dimensions are measured separately, the regional well-being framework aims to allow for comparisons and interactions across multiple dimensions to account for complementarities and trade-offs faced by policymakers. At the same time, the comparison of regional well-being indicators over time allows comparing dynamics of well-being over time, as well as the sustainability and the resilience of regional development.

Regional well-being in Spain is measured along 11 well-being dimensions: income, jobs, housing, health, access to services, education, civic engagement, environment and safety – for which there are comparable statistics at the regional level – and the 3 additional dimensions of work-life balance, community (social connections) and life satisfaction. The OECD database has available comparable data at the subnational level only for the first two. The figure below shows the details of the indicator used for each dimension.

Figure 2.24. Indicators by well-being dimension, Andalusia

	Safety
	Homicide rate (per 100 000 people), 2016
	Community
	Perceived social network support (%), 2013
	Jobs
	Employment rate 15 to 64 year-olds (%), 2017
	Unemployment rate 15 to 64 year-olds (%), 2017
	Access to services
	Households with broadband access (%), 2017
	Life satisfaction
	Life satisfaction (scale from 0 to 10), 2013
	Environment
	Level of air pollution in PM 2.5 ($\mu\text{g}/\text{m}^3$), 2015
	Health
	Life expectancy at birth (years), 2016
	Age adjusted mortality rate (per 1 000 people), 2016
	Education
	Labour force with at least upper secondary education (%), 2017
	Civic engagement
	Voters in the last national election (%), 2017 or latest year
	Income
	Disposable income per capita (in USD PPP), 2016
	Housing
	Rooms per person, 2016

Source: OECD (n.d.^[25]), *OECD Regional Well-Being (database)*, www.oecdregionalwellbeing.org (accessed on 27 May 2019).

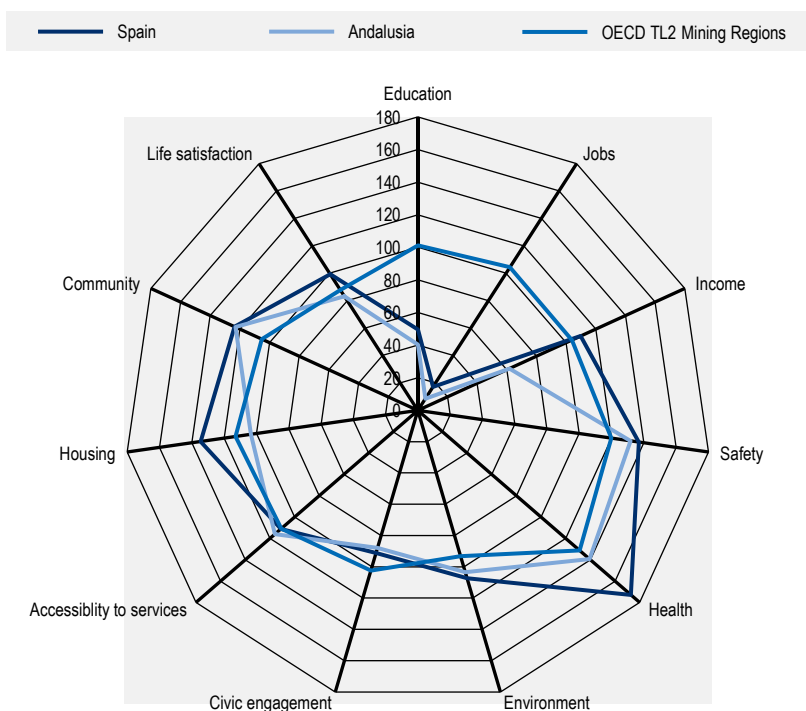
The region of Andalusia has uneven well-being results compared to the average of the OECD TL2 mining regions (Figure 2.25). Andalusia shows an above-average performance of the OECD regions in 5 dimensions of well-being out of the 11 in total. The region, therefore, ranks particularly high in Safety, Health, Environment, Civic Engagement, Housing and Community. The lowest well-being scores compared to the OECD TL2 regions refer to Education, Jobs and Income. As for Accessibility to Services, the region is slightly above the average. The downside of Andalusia and Spain lies in the low-performance dimensions that are far from the results of the OECD TL2 mining region average, which poses a great challenge for the development of policies capable of reducing this gap. In particular, dimensions such as Jobs or Education require great efforts to reach levels comparable to the other OECD regions.

The picture deteriorates when Andalusian well-being is compared to the Spanish average. Andalusia performs above the regional average in Spain only in one dimension of well-being: Accessibility to Services. In contrast, the region ranks below in all other dimensions, where Income, Health and Housing experience the lowest performance with respect to the average of regions in Spain.

Overall, Andalusia stands out among all comparison groups in the following areas:

- **Safety:** Despite low-income levels and high unemployment, the region enjoys a high level of safety. The absence of harm, whether due to crime, conflict, violence, terrorism, accidents or natural disasters, is significantly lower (9.5) compared to OECD TL2 regions (7.2). Spain (9.9), compared to the rest of the OECD countries (7.5), ranks 5th in terms of safety, equal to Portugal, showing the high level of security in the country, indispensable for the well-being of citizens.

Figure 2.25. The region's performance in the 11 OECD dimensions of well-being, 2018



Note: Simple average of OECD TL2 regions = 100.

Source: OECD (n.d.^[25]), *OECD Regional Well-Being (database)*, www.oecdregionalwellbeing.org (accessed on 10 November 2020).

- **Environmental quality:** The region's location, a large geographical area bound by the Mediterranean Sea and the Atlantic Ocean, offers a great variety of natural ecosystems, mountains and forests. This is important for the tourism industry and attracting people who value outdoor activities. Furthermore, Andalusia is the 3rd region in Spain with the largest protected area making up 18.9% of the total territorial surface.
- **Community:** The frequency of contacts with others and quality of personal relationships are crucial determinants of well-being. People get pleasure from spending time with others, be it their family, friends or colleagues. Activities are more satisfying when shared with others. Furthermore, social networks can provide material and emotional support in times of need, as well as providing access to jobs and other opportunities. The nature of social interactions also has wider implications beyond the immediate social circle, impacting levels of trust within their community, which is an important driver of other outcomes including democratic participation, crime and health (OECD, 2011^[26]).

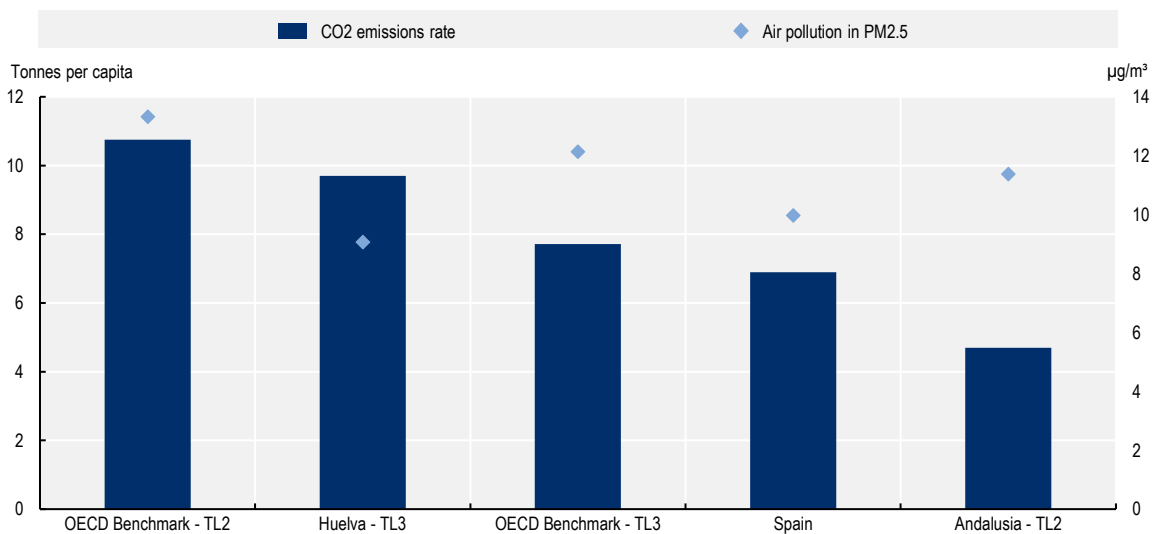
Andalusia benefits from good air quality, relevant for citizens' health

Andalusia enjoys good air quality emitting relatively low levels of CO₂ into the atmosphere and moderate levels of suspended particles 2.5 micrometres in diameter (PM2.5) (Figure 2.26). Although CO₂ exists naturally in the earth's atmosphere, the growing industrialisation and production rate is raising this figure to values much higher than normal. CO₂ has an impact on the health of citizens as well as on local and global natural ecosystems. Andalusia has a relative advantage over the other OECD TL2 benchmark of mining regions as in 2008 (last available data), CO₂ values (4.7 tonnes CO₂ per capita) were significantly below the OECD TL2 benchmark average (10.75) and slightly below the national average (6.9).

PM2.5 particles consist of a mixture that can include organic chemicals, dust, soot and metals. These particles can be generated by all kinds of combustion, including cars, trucks and factories, among other activities. Fine particle pollution has been shown to cause many serious health effects, including heart and lung disease. In this air quality indicator, Andalusia experiences moderate values, around 11.37 $\mu\text{g}/\text{m}^3$ for 2019, relatively similar in value to the 13.32, 12.13 and 9.97 for OECD TL2 and TL3 benchmarks and Spain respectively.

Mining activity has a direct impact on CO₂ emissions due to its high energy consumption. Huelva, the largest mining province of Andalusia, therefore shows relatively high values with respect to the national average although, in terms of PM2.5, it has the lowest value in comparison (Figure 2.26). In the regional development of the province, strategies with low environmental impact must be sought after. By means of innovation and the use of renewable energies as an energy source for activities such as mining, as will be explored in Chapter 3, the region can offer citizens levels of air quality that guarantee their well-being.

Figure 2.26. Air quality in Spain, Andalusia, Huelva and the TL2 and TL3 OECD benchmark



Note: The TL2 level values for air pollution in PM2.5 correspond to 2019 while, at the TL3 level, they correspond to 2012. For CO₂, the values are for 2008.

Source: OECD (2021^[15]), "Regional environment", <https://doi.org/10.1787/region-data-en> (accessed on 27 January 2020).

In contrast, Andalusia has a relatively lower performance in housing availability and health outcomes:

- In **jobs**, the region faces the challenges of unemployment. Andalusia is among the four regions with the lowest values in the employment dimension within the well-being indicators. The fact that it is the region with the largest population implies an effect that can spill over to the rest of the country, as Spain also ranks last among OECD countries in terms of unemployment. High unemployment rates and an insecure labour market first affect workers with shorter educational development, highlighting the interrelationship with Andalusia's two other weak points; education and income. The periods of long-term unemployment have a significant impact, as they weigh heavily on the welfare of individuals and their families.
- In **income**, earnings are an important component of job quality. Andalusia's GDP per capita was 74.3% of the national average (USD 37 595) and 54.5% for Madrid, underlining a difference in income for the economic capital compared to the rest of the TL2 regions.
- In **education**, investment has fallen in recent years, reaching 21.7% in 2019 with respect to total public expenditure, equalling 2005 levels (Junta de Andalucía, 2019^[18]). Furthermore, in the OECD

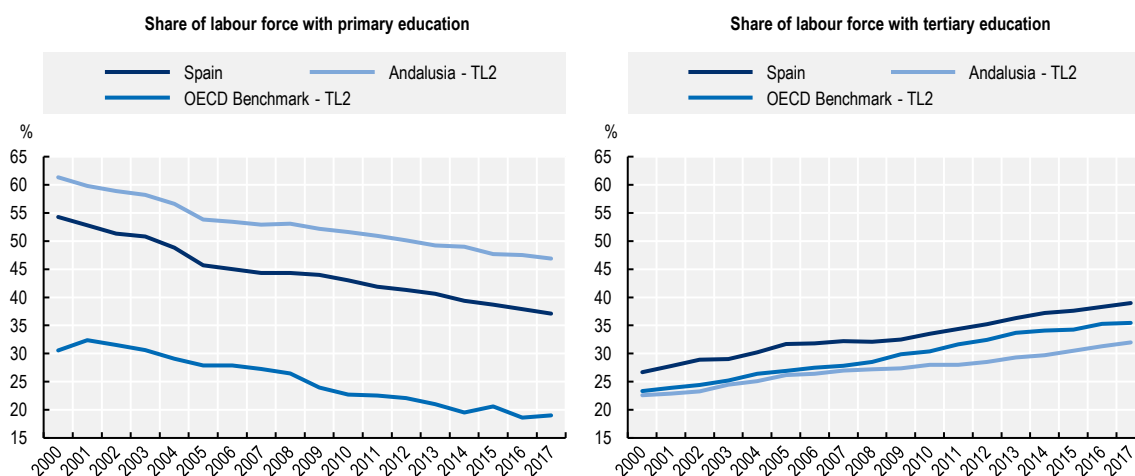
Programme for International Student Assessment (PISA), Andalusia follows the national trend that places Spain below the OECD average (OECD, 2020^[27]). Andalusia is the fourth region with the lowest scores in Spain, ahead of Ceuta, Melilla and the Canary Islands. However, when comparing Andalusia with other TL2 mining regions, the region experiences a relatively higher performance than the OECD benchmark.

Enabling factors for development

Andalusia's human capital records low levels of education, especially in Huelva

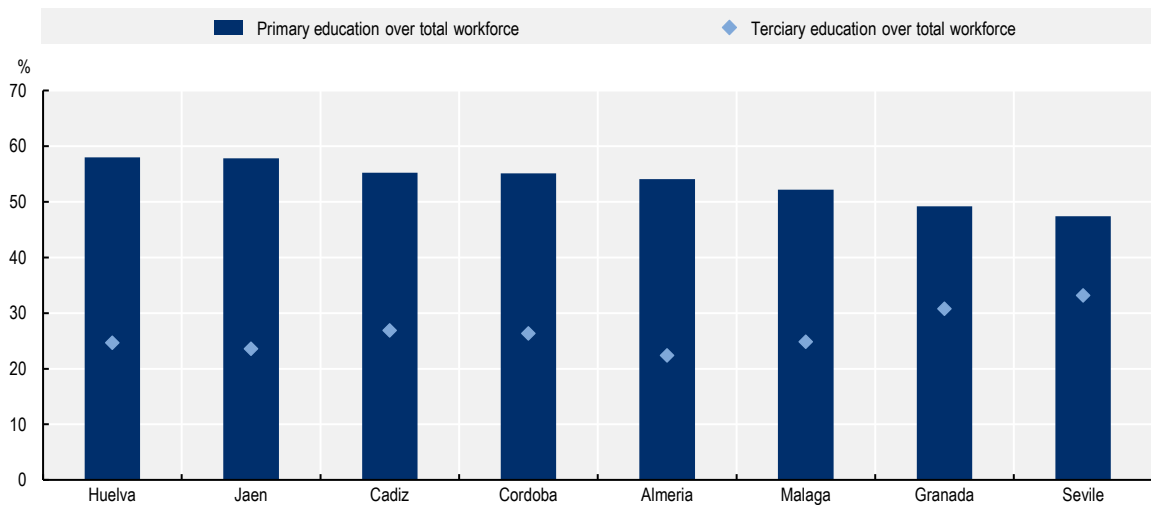
The level of education in Andalusia is relatively low when compared with the average levels of Spain and the OECD mining regions. On the one hand, the share of the population with primary education in the region dropped in the last 2 decades from 61.3% to 46.9%, experiencing a significant increase to levels comparable to those of Madrid (47.3%). Yet this value remains remarkably higher than the OECD benchmark (19%) (Figure 2.27). On the other hand, the share of the labour force with tertiary educational attainment in Andalusia has risen in the past few years, from 22.6% in 2000 to 32% in 2017. While the improvement is noticeable, the figure is still slightly below the level of TL2 OECD mining regions (35.5%) and the national level (39%) (Figure 2.27).

Figure 2.27. Share of level of education over labour force, Spain, Andalusia and OECD TL2 benchmark, 2000-17



Source: OECD (2021^[15]), "Regional innovation", <https://doi.org/10.1787/region-data-en> (accessed on 27 January 2020).

In Huelva, the education of young people is a cause of concern (Figure 2.28). The proportion of the population with only primary education (58%) is the highest among the provinces of Andalusia, followed by Jaén (57.8%) and Cádiz (55.2%). Although tertiary education in Huelva has managed to emerge from the low levels, there is still a gap. The share of the labour force in Huelva with at least tertiary education (24.7%) is behind the provincial capital, Seville (33.2%), yet above provinces such as Jaén and Almería. The divergence in the level of higher education with the national level reflect the structure of the labour market in the region and the movement of the most qualified young people to the cities. The main reasons for this regional migration are due to the high level of education of large universities, mainly in larger cities such as Granada or Seville.

Figure 2.28. Share of the level of education over labour force, provinces of Andalusia, 2014

Source: Labour Force Survey. Results for Andalusia. (IECA, 2019^[20]) ; Statistics on training, labour market and educational-formative abandonment (MEFP, 2020^[28]).

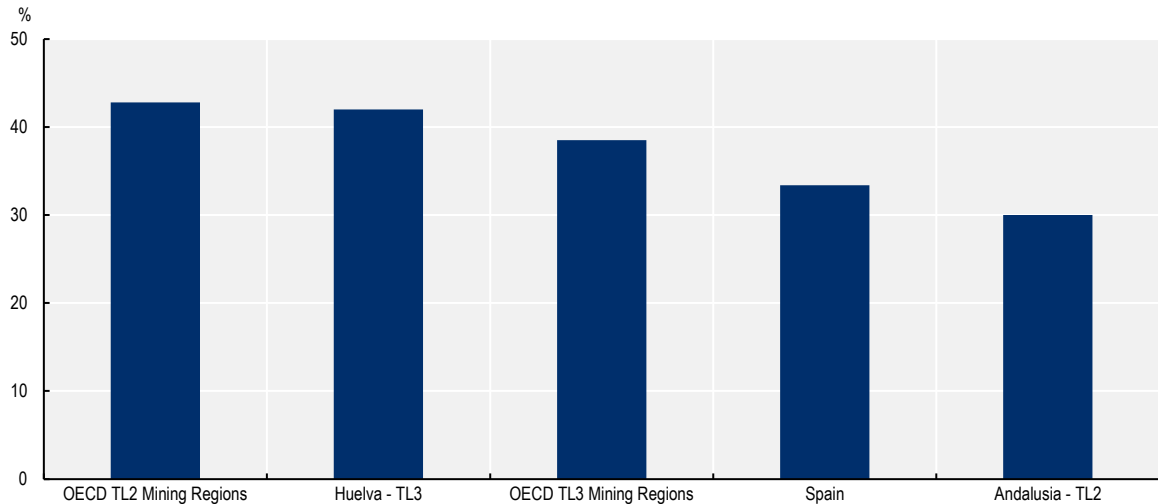
Promoting the establishment and growth of Andalusian companies as a catalyst for development

Andalusia's establishments are small in size and increasingly larger in number, constituting a shortcoming for the regional development of Andalusia. Andalusia has 30 inhabitants per establishment, slightly above the national average of 33.4, yet significantly higher than the OECD TL2 benchmark (Figure 2.29) highlighting the business atomisation of the region. While, by 2019, Andalusia recorded the sixth consecutive year of growth in the absolute number of companies, the size of these businesses remains small. In that same year, 97.7% of companies had fewer than 20 employees or no employees and provided 53.2% of employment. The remaining share of businesses with more than 20 employees accounted for 46.8% of employment, highlighting the fundamental role of large companies in job creation. Within the mining sector, non-metallic mining is a subsector mainly made up of small companies. As an example, in 2014, quarry and ornamental mining accounted for 29% of mining companies with less than 9 employees.

Overall, encouraging entrepreneurship for the creation of new companies as well as the development of existing ones is a fundamental opportunity for Andalusia, as will be explored in Chapter 3.

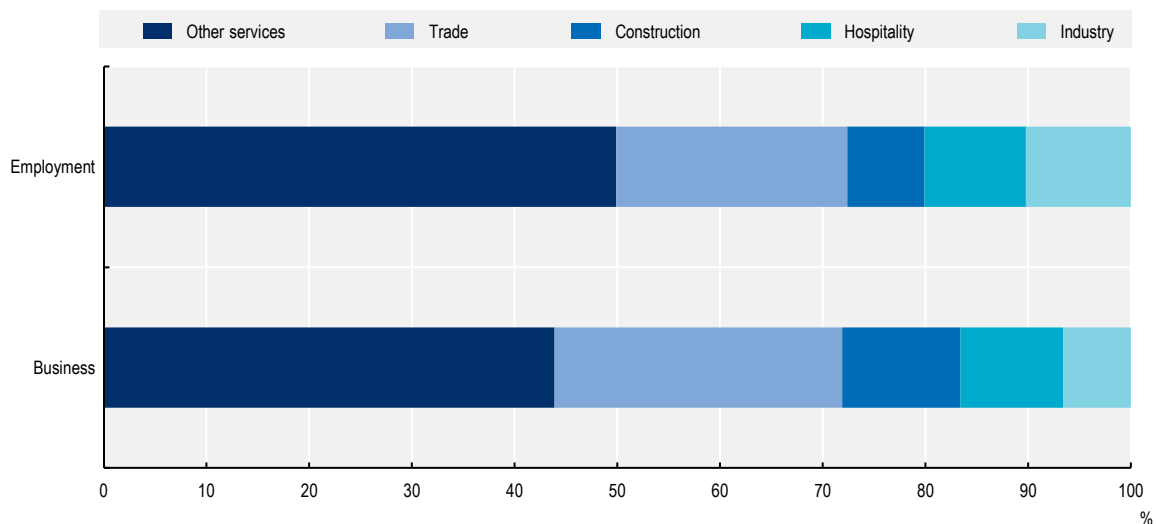
At the provincial level, Huelva amplifies the traits that the region experiences, yet with the singular opportunity of mining activities as the axis of business generation. In 2016, Huelva only contributed 18 of the 300 largest companies in Andalusia (Huelva Información, 2016^[29]). While the first 4 are companies related to agricultural products, the companies positioned next, Atlantic Copper and Mina de Aguas tenidas Matsa, with 636 and 623 workers respectively, demonstrate the importance of companies from different sectors with sufficient volume to create a prosperous business fabric. Chapter 3 will explore the promotion of higher-value-added chains around mining activities, which can serve as a lever for companies from other sectors to gain weight and support each other to generate a solid business structure, less dependent on seasonality.

Figure 2.29. Ratio of total inhabitants over establishments in Spain, Andalusia, Huelva and TL2 and TL3 OECD benchmark



Source: OECD (2021^[15]), "Regional labour", <https://doi.org/10.1787/region-data-en> (accessed on 27 January 2020).

Figure 2.30. Business and employment by economic sector in Andalusia, 2019



Source: Junta de Andalucía (2019^[30]), *Directorio de Empresas y Establecimientos con Actividad Económica en Andalucía*, <https://www.juntadeandalucia.es/datosabiertos/portal/dataset/directorio-de-empresas-y-establecimientos-con-actividad-economica-en-andalucia> (accessed on 3 October 2020).

In summary

The business scenario in Andalusia is composed of a large number of companies but of a small size, representing a disadvantage for the regional development of Andalusia. On the other hand, larger enterprises have the potential to generate economies of scale and create a business ecosystem with greater potential to absorb the labour force in a region suffering from high unemployment. In the rural areas, the limited possibility of agglomeration economies places mining companies in a pivotal position to

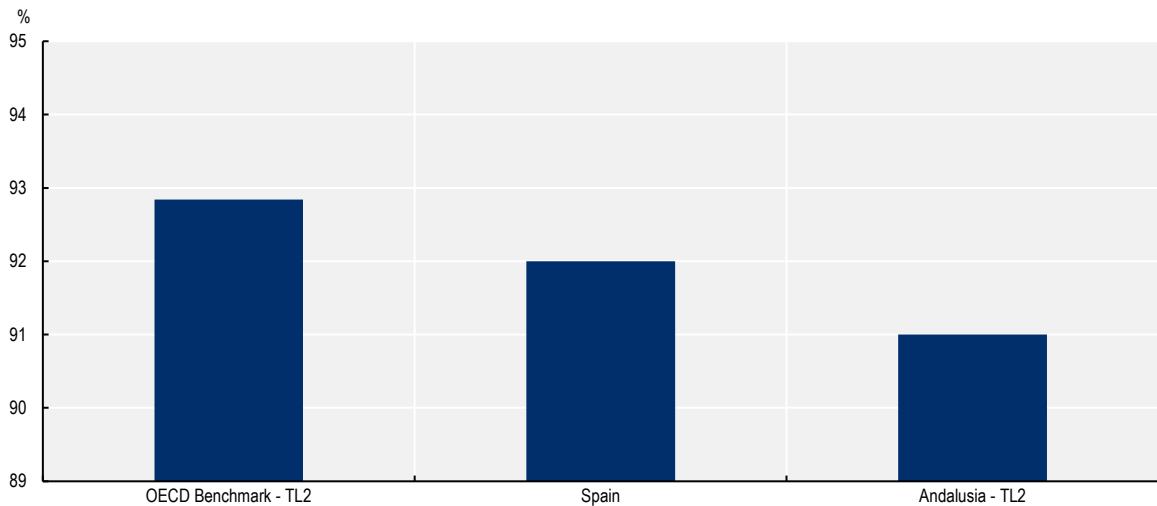
encourage the creation and growth of companies in places where they operate. Overall, a long-term co-ordinated policy strategy is needed to unlock the region's maximum potential.

Andalusia has converged on Internet access levels with the rest of the country

Andalusia has made steps forward in terms of access and use of Internet connectivity in the last years (Figure 2.31). According to OECD (OECD Regional Statistics, 2021^[15]) and the Survey on Equipment and Use of Information and Communication Technologies in Households (INE, 2019^[31]), there has been a significant increase in Andalusian households with Internet access, rising to 91% in 2019, which places Andalusia slightly below the national levels (92%) and the OECD TL2 benchmark of mining regions (92.84%). Similarly, the broadband speed has managed to converge, reaching national values. While Andalusia in network coverage greater than or equal to 30Mbps is slightly below the national average (93.0% and 94.2% respectively), it is similar to the national average in fixed network coverage greater than or equal to 100Mbps (82% for both).

In terms of use, 92.4% of Andalusians have used the Internet in the last 3 months, which is very close to the national average (93.2%) (INE, 2020^[32]). Furthermore, with mobile phones being increasingly used as an Internet access point, in Andalusia, almost all households have one (98.1%). Access to and use of telecommunications services is especially relevant given the context caused by the COVID-19 which has led many workers to telework, making use more than ever of these services deployed in the regions.

Figure 2.31. Percentage of population using the Internet, 2019

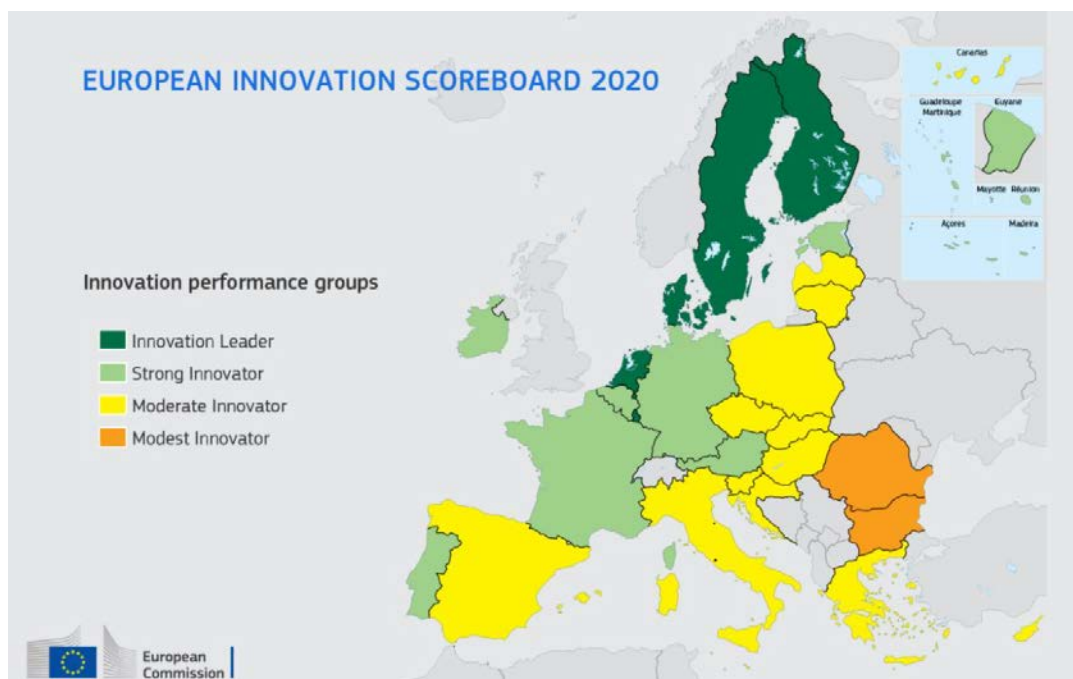


Source: OECD (2021^[15]), "Regional innovation", <https://doi.org/10.1787/region-data-en> (accessed on 27 January 2020).

Andalusia is a moderate innovative region in a moderate innovative country

Spain is one of the countries with the lowest levels of innovation in the EU, placing its investment in R&D significantly below the European average (Figure 2.32). Spain requires significant changes to keep pace with countries such as Spain, which leads innovation in Europe based on the training of its human resources and its digital infrastructure, or Portugal, which has improved to become a strong innovator and leader in innovation in SMEs. The average annual public spending on R&D in Spain was 1.24% of total GDP, behind Europe (1.96%) and behind the average of OECD countries (2.37%). In 2018, Andalusia allocated 0.92% of its GDP to this purpose, placing it behind other regions such as the Basque Country (1.96%), Madrid (1.71%) and Navarre (1.68%) (INE, 2020^[8]).

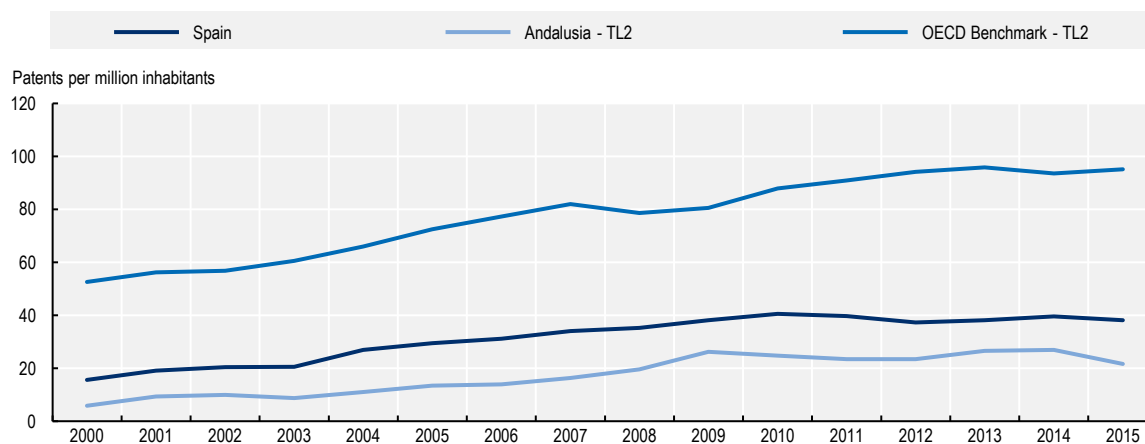
Figure 2.32. European Innovation Scoreboard, 2020



Source: EC (2020^[33]), *EC RIS 2019 (database)*, <https://ec.europa.eu/docsroom/documents/36081> (accessed on 23 February 2020); EC (n.d.^[34]), *European Innovation Scoreboard*, https://ec.europa.eu/growth/industry/policy/innovation/scoreboards_en.

The European criterion for measuring innovation through a wide range of indicators classifies the region of Andalusia as a “moderate innovative region” within the Regional Innovation Scoreboard (European Commission, 2020^[33]). However, patent applications (Figure 2.33) and investments in R&D are below the European average levels in 2018 (22 patent applications per million inhabitants), still below the national (38) and European (106.84) averages (European Commission, 2020^[33]). The bottlenecks generated by a relatively low performance in innovation will be explored in Chapter 3 as well as unlocking the region’s potential to cope with the challenges of the future. Particularly low are the levels of innovation related to SMEs, an opportunity to be explored and which will be further discussed in the following chapters.

Figure 2.33. Patents in Spain, Andalusia and comparable TL2 regions, 2000-15



Source: OECD (2021^[15]), “Regional labour”, <https://doi.org/10.1787/region-data-en> (accessed on 27 January 2020).

In summary

Andalusia has a social perception that outstands the average levels of the OECD. Community engagement is fundamental to face the rest of the challenges that Andalusia faces, mainly those related to education, jobs and income. Strengthening public investment in research as well as strengthening links between universities and companies are important to raise the level of innovation in the region. Currently, the levels of innovation in Andalusia are moderate in comparison with the rest of Europe, with room for improvement to increase investment and strategies to promote innovation.

Table 2.8. Well-being and enabling factors summary

	Spain, Andalusia and OECD TL2 benchmark	Huelva, Andalusia and OECD TL3 benchmark
Well-being	<ul style="list-style-type: none"> Andalusia outperforms in safety, community and environment over the other mining OECD TL2 benchmark. On an environmental level, the leading mining region in Spain has positive air quality values compared to the OECD TL2 benchmark. 	<ul style="list-style-type: none"> Although Huelva, the leading mining province in Andalusia, has similar per capita CO₂ levels to the OECD TL3 benchmark, it is the province with the lowest PM2.5 levels of all regions compared.
Education	<ul style="list-style-type: none"> The level of education in Andalusia is relatively low in Spain and the context of the OECD. However, between 2000 and 2017, the proportion of the labour force with lower education decreased from 61.3% to 46.9%, reaching the levels of Madrid (47.3%). Higher education in Andalusia has increased in recent years, from 22.6% to 32% (2000-17). This figure is slightly lower than the level of the OECD TL2 mining regions (35.5%) and the national level (39%). 	<ul style="list-style-type: none"> In Huelva, the proportion of the population with primary education (58%) is the highest in the provinces of Andalusia, followed by Jaén (57.8%) and Cádiz (55.2%). Although tertiary education in Huelva has managed to emerge from the low levels, there is still a significant gap. Huelva, at 24.7%, is above provinces such as Almería and Jaén but still lags behind the provincial capital Seville (33.2%).
Business environment	<ul style="list-style-type: none"> Andalusia has 30 inhabitants per establishment, slightly higher than the national average of 33.4, although significantly higher than the OECD mining regions, highlighting the business atomisation of the region. In 2019, 97.7% of enterprises had fewer than 20 employees or no employees at all, while enterprises with more than 20 employees accounted for 46.8% of employment. 	<ul style="list-style-type: none"> In 2016, Huelva only contributed to 18 of the 300 largest companies in Andalusia. The largest 4 of these 18 are related to agricultural products. Atlantic Copper, MATSA and Mina de Aguas Teridas then demonstrate the importance of companies from different sectors with sufficient volume to create a prosperous business environment.
Broadband	<ul style="list-style-type: none"> Andalusia's broadband access rose to 91% in 2019, which places the region slightly below the national average (92%). In terms of use, 92.4% of Andalusians have used the Internet in the last 3 months, which is very close to the national average (93.2%). Andalusia's network coverage greater than or equal to 30Mbps is slightly below the national average (93.0% and 94.2% respectively) and similar to the national average (82% both) in fixed network coverage greater than or equal to 100Mbps. 	
Innovation	<ul style="list-style-type: none"> The region is moderately innovative in the European context, held back by relatively low investment in R&D compared to the national and European average. The average annual public spending on R&D of Andalusia was 0.92% of total GDP, significantly behind Europe (1.96%) and Spain (1.24%). 	<ul style="list-style-type: none"> Given the location of the mining industry and economic activity with a high added value, Huelva has the possibility of transferring innovation to boost its business environment across the province.

Annex 2.A. Selected OECD TL2 and TL3 mining regions

Annex Table 2.A.1. Benchmark of OECD TL2 regions used for comparison with the TL2 region of Andalusia

Region	Code	Country
Wallonia	BE3	Belgium
Grand Est	FRF	France
Nouvelle-Aquitaine	FRI	France
Occitanie	FRJ	France
Auvergne-Rhône-Alpes	FRK	France
Provence-Alpes-Côte d'Azur	FRL	France
Brandenburg	DE4	Germany
Lower Saxony	DE9	Germany
Saxony-Anhalt	DEE	Germany
Lazio	ITI4	Italy
Hokkaido	JPA	Japan
Tohoku	JPB	Japan
Northern-Kanto, Koshin	JPC	Japan
Chugoku	JPH	Japan
Shikoku	JPI	Japan
Gyeongbuk Region	KR03	Korea
Jeolla Region	KR04	Korea
Chungcheong Region	KR05	Korea
Veracruz	ME30	Mexico
Groningen	NL11	Netherlands
Western Norway	NO05	Norway
Lower Silesia	PL51	Poland
Galicia	ES11	Spain
Catalonia	ES51	Spain
Valencia	ES52	Spain
East Midlands	UKF	United Kingdom
South West England	UKK	United Kingdom
Kentucky	US21	United States
Utah	US49	United States

Note: Selection of regions based on the region's specialisation in the mining sector as well as its location quotient and desk research to select the suitability.

Annex Table 2.A.2. Benchmark of OECD TL3 regions used for comparison with the TL3 region of Andalusia

Region	Code	Country
Klagenfurt-Villach	AT211	Austria
Cher	FRB01	France
Ardennes	FRF21	France
Aube	FRF22	France
Drôme	FRK23	France
Düren	DEA26	Germany
Heraklion	EL431	Greece
Komárom-Esztergom	HU212	Hungary
Zala	HU223	Hungary
Somogy	HU232	Hungary
Jász-Nagykun-Szolnok	HU322	Hungary
Csongrád	HU333	Hungary
L'Aquila	ITF11	Italy
Potenza	ITF51	Italy
Cosenza	ITF61	Italy
Grosseto	IT11A	Italy
Pieriga	LV007	Latvia
Noord-Overijssel	NL211	Netherlands
Trencín Region	SK022	Slovak Republic
León	ES413	Spain
Salamanca	ES415	Spain
Almería	ES611	Spain
Cádiz	ES612	Spain
Cordoba	ES613	Spain
Granada	ES614	Spain
Jaén	ES616	Spain
Málaga	ES617	Spain
Seville	ES618	Spain
Västerbottens County	SE331	Sweden
Champaign-Urbana, IL	US028	United States
Topeka, KS	US167	United States

Note: Selection of regions based on the region's specialisation in the mining sector as well as its location quotient and desk research to select the suitability.

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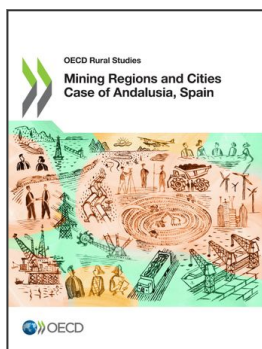
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Notes

¹ Autonomous means that each of these autonomous communities has its own executive, legislative and judicial powers.

² The criteria to determine the areas affected by depopulation will be the demographic density, the ratios of ageing and birth rate, the geographical isolation and the difficulties of territorial structuring.

³ Wholesale and retail trade also includes repair of motor vehicles and motorbikes, transport and storage, hotels and restaurants.



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