PUBLIC SECTOR PERFORMANCE PROGRAMME 2022-2025

An International Benchmarking Study
Sub-Study 2023

The European Institute of Public Administration (EIPA) in cooperation with the Ministry of the Interior and Kingdom Relations of the Netherlands

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Ministerie van Binnenlandse Zaken en Koninkrijksrelaties

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1. INTRODUCTION

1.1. FOREWORD

The European Institute of Public Administration (EIPA) in cooperation with the Ministry of the Interior and Kingdom Relations of the Netherlands ('the Ministry') is conducting a benchmarking study 2022-2025, having as an objective an in-depth analysis of public sector performance in 35 countries. It is the fourth edition of the study with previous reports published in 2004, 2012 and 2015. The current edition updates key indicators and extends the previous editions by including additional indicators and policy areas. In the course of 2022 to 2024, the programme analyses public sector performance in ten policy areas; in 2025, the respective sub-studies will be updated and revised to include the latest data and recent developments. This report presents results of the second 2023 sub-study of the Public Sector Performance Programme, covering the following three domains:

- economy, infrastructure and science, technology and innovation
- social security, employment, income and wealth
- environmental protection and climate change

The 2024 sub-study will be concerned with:
- health
- sports, culture and participation
- international best practices in social security systems

Finally, in 2025 the sub-studies published between 2022 and 2024 will be updated with the latest figures, information and further analysis of all policy areas and public services concerned.

The Public Sector Performance Programme is conducted thanks to the generous grant of the Ministry, which enables the extension in terms of scope and depth of analysis of public sector performance in respective policy areas. From the Ministry side the programme is led by Frans van Dongen (Programme Manager Public Performance). The EIPA team is very grateful to him for his support throughout the project and is particularly happy about the fruitful cooperation with the Ministry.
The EIPA team consists of Dr. Iwona Karwot (Project Leader and Senior Lecturer), Miranda Lovell-Prescod (Researcher and EIPA Data expert), Paolo Giovanetti (Research Assistant) and Björn Hölbling (Digitalisation Officer & Researcher).

The EIPA team wishes to express its gratitude to external experts involved in the preparation of the following chapters: economy, infrastructure and science, technology and innovation – Prof. Dr. Daniel Díaz-Fuentes and Prof. Dr. Judith Clifton (University of Cantabria, ES); for social security, employment, income and wealth – Dr. Michael Dauderstädt (former director of the division for economic and social policy of the Friedrich Ebert Foundation, DE); for environmental protection and climate change – Dr. Emma Avoyan and Dr. Iulian Barba Lata (Radboud University Nijmegen, NL).

The EIPA team would also like to thank: Drs. Frans Duijnhouwer and Floris Swets from the Ministry of Infrastructure and the Environment, Lieske van der Torre and Robin Bode from the Ministry of Social Affairs and Employment, for their support during the preparation process of the 2023 sub-study; Drs. Waldemar de Haas (Power BI Knowledge) for trainings provided to our team this year and his contribution, advice and help during preparation of the interactive Dashboard of the 2022-2025 Benchmarking Study.

The coordination between all partners involved in the preparation process of the 2023 sub-study report began with the kick-off meeting which took place on 25 January 2023. During the meeting the Ministry, the EIPA team and the external experts agreed on the next steps to deliver the sub-study. It was agreed that the plan of each chapter should be completed in April, the first draft between May and June and the final version should be delivered in October. It was also agreed to carry out the final conference in early February 2023. Finally, to facilitate coordination, it was decided to hold regular meetings between all partners every two months, and monthly meetings for each policy area between the relevant experts, the Ministry and the EIPA team.

1.2. INTRODUCTION

In response to recent social and economic crises, we are witnessing the acceleration of the trend of increasing state intervention in various social and economic policies. After years of contractionary fiscal policies, de-regulation and privatisation, this 'return of the state' seems to reverse at least some of these trends, thus shifting the balance between the public and the private, the state and the market in the production and delivery of public services. While this balance is subject to specific historical, social and political contingencies in various political systems, the overarching objectives of all democratic systems of governance is the efficient and effective provision of public services for citizens. For it is the citizenry that, in democratic systems, delegates specific tasks to state institutions, which are in turn accountable to these same citizens. Hence, public sector performance is essential for upholding this circle of delegation and accountability, and thereby the quality and legitimacy of government action.

The EIPA Public Sector Performance Programme examines the performance of the public sector in 35 countries (see box below). The EIPA study will update the SCP report and broaden its perspective by including additional indicators. Moreover, all policy areas will be analysed in depth and separately to support better insight into the achievements of every policy domain. It will be the fourth edition of the study since the last report published in 2015, prepared by the Netherlands Institute for Social Research (Sociaal en Cultureel Planbureau – SCP), covering the period from 1995 to 2012.

Countries included in the study with abbreviations

AT	Austria	ES	Spain	NL	The Netherlands
AU	Australia	FI	Finland	NO	Norway
BE	Belgium	FR	France	NZ	New Zealand
BG	Bulgaria	HR	Croatia	PL	Poland
CA	Canada	HU	Hungary	PT	Portugal
CH	Switzerland	IE	Ireland	RO	Romania
CY	Cyprus	IS	Iceland	SE	Sweden
CZ	Czechia	IT	Italy	SI	Slovenia
DE	Germany	LT	Lithuania	SK	Slovakia
DK	Denmark	LU	Luxembourg	UK	United Kingdom
EE	Estonia	LV	Latvia	US	United States of America
EL	Greece	MT	Malta		

In this sub-study, we present the results of the following three policy areas covered by the Public Sector Performance Programme:

- economy, infrastructure and science, technology and innovation
- social security, employment, income and wealth
- environmental protection and climate change

The main objective of the study is to provide a comprehensive analysis of public sector performance in the respective policy areas by answering the following questions:

- What are similarities and differences in terms of input, output and outcome? Which countries perform best and which are the worst?
- How do inputs, outputs and outcomes change over time?
- How effective are countries in the achievement of objectives? How efficient are countries in the process of service delivery? What is the correlation between inputs and outputs?
- What is the perception of citizens and other relevant stakeholders, regarding service delivery (e.g. satisfaction, trust)?
- How can we explain similarities and differences between countries?

The report is structured as follows. First, we introduce the conceptual framework and research design underpinning the study. This framework will inform the analysis in the three thematic chapters providing a common terminology and conceptualisation of public sector performance. The first thematic chapter covers public sectors from the perspective of economy, infrastructure and science, technology and innovation. The second following chapters deal with social security, employment, income and wealth. The third chapter is concerned with environmental protection and climate change. In the concluding chapter, the results of the thematic chapters are synthesised.

2. RESEARCH DESIGN AND CONCEPTUAL FRAMEWORK

The research design of the Public Sector Performance Programme was developed in line with the objectives and research questions of the study. The design is based on the following steps (Van Dooren, 2015): defining study objectives, selection of indicators, data collection, analysis and reporting.

The **conceptual framework** is based on the input–output–outcome model commonly applied in benchmarking studies (see Figure 1)[1]. The model distinguishes between output, outcome and impact, and includes the relation between input and output, i.e. throughput and processes and the efficiency of service delivery, as well as causal mechanisms to explain outcomes and the relation between input–outcome related to the cost-effectiveness.

It includes the following concepts:

- **Environment:** social, economic and political context of a public service or policy area;
- **Needs:** the functional requirements of service deliver and the political demands stemming from the environment;
- **Objectives:** the goals set as a result of these demands;
- **Input:** anything that is put into a system, e.g. an organisation that addresses input with a view to produce an output – in the context of benchmarking studies, these are non-monetary and monetary resources dedicated to service delivery;
- **Activity:** actions that are necessary to process input with a view to producing an output;
- **Output:** anything that comes out of a system being the result of input processing – output might be used immediately or be readily available for use by citizens in the future;
- **Effect/outcome:** anything going beyond output, i.e. the societal, economic and political results relevant for a policy area;
- **Trust:** the belief of citizens in the ability of public sector organisations to deliver services and to achieve desirable objectives.

In addition to the concepts included in the model, the study will also take into consideration the concept of **satisfaction**, defined as a subjective indicator which measures the quality of a specific service (Bouckaert & van de Walle, 2003).

The concept of **environment** will be further developed to include the **mechanisms, policy design and institutional arrangements**. These elements are relevant in shaping the policy outputs and outcomes, and contribute to explaining the differences in the countries' performances.

The model entails two **dimensions of analysis**: the span of performance and the depth of performance.

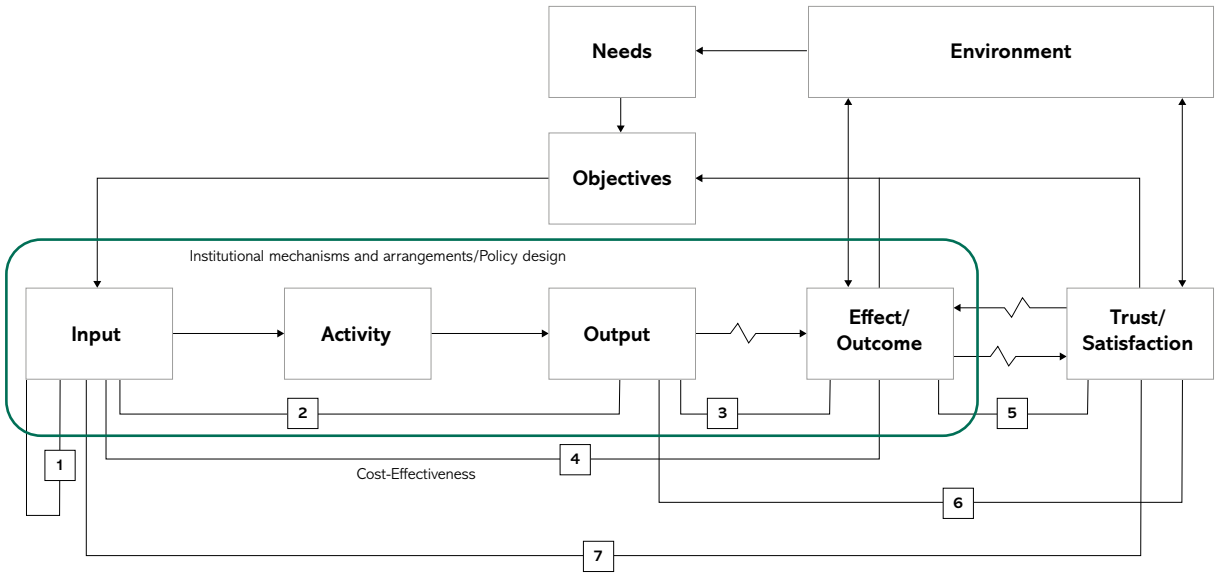
The **span of performance** relates to the causal relationships between concepts. Three relationships can be distinguished: efficiency, effectiveness and cost-effectiveness, and trust and satisfaction. These relationships link the various concepts of the model and range from a minimum to a maximum span (see numbers in Figure 1).

- **Link 1 (economy) and 2 (efficiency)**
  The minimum span of performance relates input with output. It is concerned with the efficiency of service delivery, i.e. the level of productivity in transforming input into output.

- **Link 3 (effectiveness) and 4 (cost-effectiveness)**
  The medium span of performance relates input with outcome, and output with outcome. It is concerned with the effects of service delivery, i.e. the effectiveness in achieving objectives and the comparison between relative costs and outcomes. Hence, analysing the medium span of performance also includes consideration of the environment of service delivery and the setting of objectives based on environmental needs and demands.

- **Link 5, 6 and 7 (satisfaction and trust)**
  The maximum span of performance relates input, output and outcome with satisfaction and trust. It is concerned with the effects of efficient and effective service delivery on satisfaction and trust. Hence, the analysis of the medium span of performance includes consideration of the environment of service delivery and the setting of objectives based on environmental needs and demands. Moreover, satisfaction is not only affected by public performance, but also affects service delivery; there are inverse causal relations.

Figure 1: Conceptual framework



Source: Bouckaert & Halligan 2008:16 (modified)

[1] This section follows the chapter 'What is managing performance?' (see Bouckaert & Halligan 2008: 11-34).

The **depth of performance** relates to the level of analysis.

- The **micro-level** relates to direct **service delivery to the user/customer/citizen**. The perception of citizens as users of services is thus an important element of performance measurement. The level of satisfaction is the result of the interaction between citizens' expectation and the quantity and quality of service delivery. In this respect, trust in the service-delivering organisation is positively related to outcomes and thus has an impact on satisfaction.
- The **meso-level** relates to **service delivery by several organisations in a specific policy area**. This level is concerned with performance of polices and thus satisfaction with, and trust in, the delivery of policies to achieve specific, policy-relevant objectives.
- The **macro level** relates to **public performance of countries**, including several performance indicators from various policy areas. This level is ultimately concerned citizens' trust in the state institutions and the state itself.

The scope covering 35 countries, 10 policy areas and the study objectives were defined in close cooperation with the Ministry. Defining study objectives is essential for benchmarking as it narrows down and specifies which public services will be the subjects for examination. The study objectives relate to the analytical value added by the Public Sector Performance Programme:

- updating the results of the 2015 SCP report;
- broadening the scope by including additional indicators;
- providing more comprehensive analysis.

In line with the elements of the conceptual framework of the study, the main objective is to examine the effectiveness, efficiency, cost-effectiveness, satisfaction and trust of citizens, enterprises and other relevant stakeholders. This regards available products, services, provisions and outcomes in ten policy areas in 35 countries, with a longitudinal perspective.

These specifications facilitate the selection of performance indicators and data collection. The data informing the study is based on primary and secondary data (policy-relevant and academic literature). The primary data consist of datasets that include numerical data measuring performance and other indicators in policy areas and countries within the scope of the study. In general, indicators are essential for measuring performance in line with the conceptual framework underlying the analysis.

There are three characteristics of indicators which are most relevant in terms of measurement: objective and subjective measurement, single and ratio indicators, and composite indicators.

Objective and subjective measurements

Objective measurement refers to a 'precise assessment of a dimension of performance' and involves an 'external process to verify its accuracy' (Andrews et al., 2007). The best example is perhaps the results of school exams. **Subjective measurement** refers to a dimension of performance, but is subject to judgement either by individuals inside (e.g. managers) or outside the organisation (e.g. clients and citizens).

Single and ratio indicators

Single indicators measure characteristics of separate elements of the conceptual framework; **ratio indicators** measure the relationship of elements (Van Dooren, 2015). The distinction between single and ratio indicators corresponds with the grouping of research objects. Single indicators measure performance based on isolated concepts, whereas ratio indicators measure performance of related concepts.

Single Indicators	Ratio Indicators
Environment	Efficiency (input–output)
Input	Effectiveness (output–outcome)
Output	Cost-effectiveness (input–outcome) (environment)
Outcome	Satisfaction and trust (input–output–outcome–trust) (environment)

The use of ratio indicators requires that indicators for two related concepts have to be combined to analyse efficiency, effectiveness, cost-effectiveness and the related effects on satisfaction and trust. This includes input indicators and indicators that measure the environment (or relevant aspects of it) in which the delivery of public services takes place. There are several input factors that are presumably relevant to services across the board, but we assume that for each policy area, specific environmental aspects, and thus input indicators, are relevant for service delivery in the respective areas.

Composite indicators

While indicators measure specific aspects of performance, these aspects can be conceptualised as being multi-dimensional. For instance, the quality of an educational system can be appraised with several dimensions, e.g. the number of graduates or equality in terms of access. Single indicators only provide snapshots of complex realities while composite indicators account for the multidimensionality of objects. By doing so, composite indicators also reduce the number of single indicators needed for assessing performance. At the same time, the construction of composite indicators is methodologically challenging. These pros and cons should be kept in mind.

The study adopts two main **data collection methods**: administrative data from programme or agency records, and 'customer' surveys (Hatry, 1999). The first method is useful for gathering input, output and, to some extent, outcome indicators, while the second one is an important source of information about service quality and outcomes.

The data come from **external data sources** provided by national and international organisations, i.e. Eurostat, OECD, UN statistics, the World Bank and National Statistics Institutes. The data search is also complemented by other methods, e.g. 'snowballing' by reviewing reference lists in the selected relevant literature.

The selection of the data has been performed taking into account the full coverage of the countries considered by the benchmarking study, the indicators used in the previous version of the study, and new relevant indicators for comparing and measuring the performances of public sector in each policy area, as well as the perception of service delivery, user satisfaction and citizens' trust.

The selection has been made also taking into consideration the coverage of the time frame 2007–2020.

In terms of analysis, the most important element of the Public Sector Performance Programme is the comparison of performance against a specific norm or target. For comparative analysis at the systems level (countries), the performance of other countries can be used as a benchmark. The comparison of indicators facilitates learning by confronting specific elements of performance (e.g. output) between comparable countries.

The study aims to examine public sector performance from a comparative and longitudinal perspective. This includes comparison of countries' performance horizontally (cross-country) and over time, usually based on quantitative single or ratio indicators as well as composite indicators. Moreover, the study utilises several univariate and multivariate methods of quantitative analysis; details are provided in the respective chapters and technical annexes.

3. ECONOMY, INFRASTRUCTURE AND SCIENCE, TECHNOLOGY AND INNOVATION

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3.1. INTRODUCTION

3.1.1. Conceptual framework and methodology

The conceptual framework underpinning this chapter on Economy, Infrastructure and Science, Technology and Innovation follows what was used in the Public Sector Performance Programme (see, for example, EIPA, 2023), which, in turn, was developed based on Van Dooren (2015). It is based on the input-output commonly used in benchmarking studies, and distinguishes between output, outcome and impact. It includes the following concepts: environment of the policy service or policy area; needs, such as the functional requirements of service delivery, and political demands stemming from the environment, objectives, and goals set as a result of these demands. Input is understood as items put into the system; activity as actions necessary to process input in order to produce an output. Output is understood as items coming out of the system, being the result of input processing; and outcomes as items going beyond output, including the societal, economic, and political results which are important for policy areas. Trust and satisfaction are also included in the framework, related to whether and how citizens think public sector organizations can deliver public services in a satisfactory way.

The overall framework as described above has been tailored in order to apply to the topics under study in this chapter.

3.1.1.1. Conceptual framework for the Economy

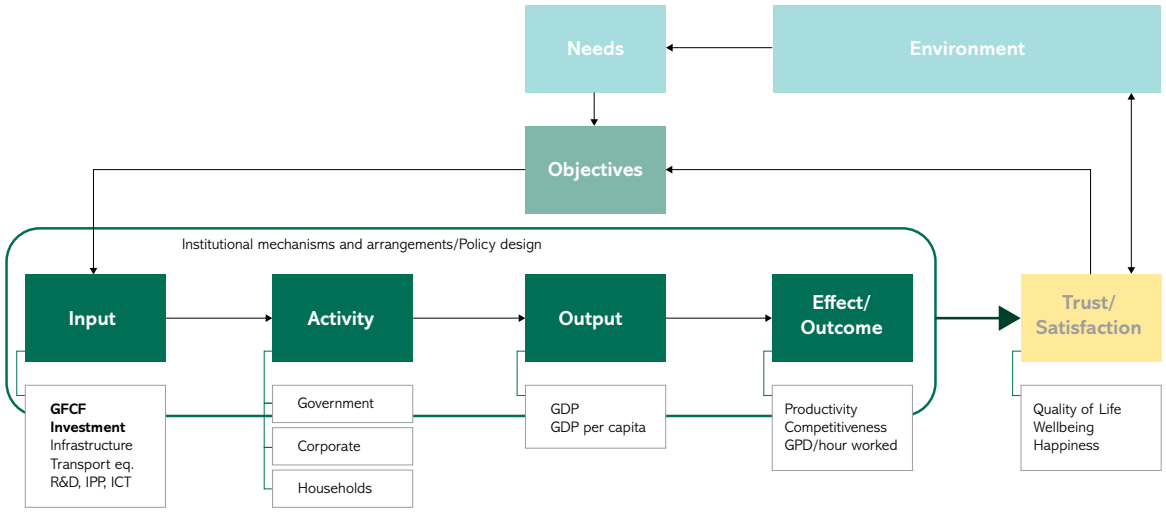


Diagram 1: The Conceptual framework for the Economy

As seen in Diagram 1 and, as will be explained in greater detail in this chapter, the main indicator selected to analyse Inputs at the general level of the Economy is Investment, or, Gross fixed capital formation (GFCF). As regards Activity, whilst Investment is a core indicator for overall performance at the Economy level (GDP), it is important to know which actor is conducting the Investment and into which sector. Our indicators here, therefore, include Government, Corporations or Households, as explained in section 5.2.3. Outputs are captured using GDP, as well as GDP per capita. We also include indicators on outcomes, including productivity, competitiveness and GDP/hour worked. Finally, indicators for trust and satisfaction include those on Regulatory Quality, Control of Corruption, Well-being, and Happiness.

3.1.1.2. Methodology

This chapter builds on a previous study conducted for EIPA (2023) on the Economy. However, it represents significant improvement as regards coverage, depth and scope. It follows the methodological approach taken in previous EIPA studies, such as EIPA (2023) and follows the standard steps used by EIPA (2023) as regards the steps taken in the research process. For all the concepts included in the conceptual framework, visualised above, namely, Inputs, Activity, Outputs, and Outcomes, the chapter describes the concepts, identifies and presents the best available indicators relevant to capture those concepts, and explains the data sources, including noting where data on specific indicators for certain countries are not available.

The chapter first focuses on the Economy, at the general level, then moves to the more specific levels of Infrastructure and Science, Technology and Innovation. After examining how the 35 countries under study perform in these single indicators over time, the study analyses the benchmarking questions posed by EIPA (2023), in particular, country effectiveness, efficiency and cost-effectiveness as regards achievements. These are obtained using the following approach: correlations between Inputs and Outputs (efficiency); between Outputs and Outcomes (effectiveness) and between Input and Outcomes/Environment (Cost-effectiveness). Finally, the perception of citizens, and other relevant stakeholders regarding service delivery (indicators on satisfaction, trust, where available) are explored. Differences between countries, and country groups, are provided and, where possible, potential explanations for these differences are tentatively suggested.

3.1.2. The goals of this chapter

The main goals of this chapter are to examine in detail the performance of 35 countries considering the three important areas; the Economy, Infrastructure, and Science, Technology and Innovation. The countries under study include the EU-27, in addition to Iceland, Norway, Switzerland, and United Kingdom (UK). Beyond Europe, the other countries included are Australia, New Zealand, Canada and the United States (US). We take a longitudinal approach, and the time period under consideration ranges from 2007 to the latest date in which the required data is available, which is usually 2021. Once we have examined the performance of each of these countries, following the conceptual framework set out above, we attempt to establish a a ranking of countries by performance in each of the three topics under study.

3.1.3. Chapter outline

The chapter is organised in the following way. First, we present, and explain, the selected indicators required by the concept framework at the general level for the Economy. The logic behind using specific indicators for each of the concepts is provided and explained, and the sources of information from which the data was derived is provided. In some cases, where data was unavailable, this is also stated. Second, a comparative analysis on the performance of single indicators organised by country, but also country group, is presented. Third , based on the first and second steps, the analysis combines the relevant indicators to extract findings on performance, specifically, for efficiency, effectiveness, cost-effectiveness and citizen perceptions. Next, we follow the same steps described above, focusing first on the relevant, disaggregated, indicators for Infrastructure, and then, for Science, Technology and Innovation.

3.2. ECONOMY (SINGLE INDICATORS)

In this section, we apply the conceptual framework, as visualised in Figure 5.1.1.1., in order to better understand the performance of the 35 countries under study at the general level of the Economy. First, we present and explain the indicators used for each concept (Inputs, Activities, Outputs and Outcomes), and the sources of data, before proceeding to the analysis.

3.2.1. Environment

The environment in which the topics of the Economy, Infrastructure and Science, Technology and Innovation can be understood over the period under study in this chapter, that is, from 2007 to 2021 is one of significant volatility and turbulence. Indeed, this period has experienced what some call “megacrises” or what the historian Adam Tooze has labelled “polycrises” (Tooze, 2021). Generally speaking, there is a perception that the relatively predictable trajectory of the Economy has been disrupted and, once partial recovery is regained, another crisis emerges. Worse still, before society had recovered from a crisis, another sets in.

Of the multiple crises that significantly affected the Economy during this time, three particularly impacted the countries under study in this chapter. The first major crisis comes in the shape of the Financial and Economic crises from 2007 onwards, which affected all countries under study. However, as we shall see, these crises had an uneven effect across the countries under study. Some countries recovered relatively well after, whilst other countries stagnated.
The consequences of these crises, were particularly negative and severe for Southern Europe, especially for Greece, as well as negatively impacting Ireland in Western Europe, and Iceland, in Northern Europe.

After these crises, many countries in the study exhibited satisfactory or partial returns to normality, as regards to growth and investment during the period from 2015 to 2019. This included important policy interventions in the EU context, such as, recovery plans through the Investment Strategy and the European Fund of Strategic Investment (EFSI), from 2015 to 2020. However, the shock result of the referendum in which the UK made the decision to leave the EU led to the gradual decoupling of the UK from the rest of the EU, particularly from 2016 onwards. As our chapter shows, Brexit has been accompanied by worrying developments in the UK from an economic point of view.

As the dust from Brexit settled and economies had either rebounded or where on a path to recovery, the COVID-19 pandemic broke out in the first few months of 2020. This had a significantly negative effect on all economies under study in this chapter and, again, this crisis, layered on top of the other crises mentioned, had uneven consequences for countries' economies, as we will see. Most recently, the invasion of Ukraine by Russia added to the layering of more crises across Europe, accompanied by a crisis of the costs of living for citizens and a potential slow-down of politicians' will to push the Green transition agenda forward. Data on economic indicators, as found in the figures and tables in this section, as well as the accompanying analysis, attempts to describe how multiple crises affected the countries under study in this chapter.

3.2.2. Inputs

At the general level of the Economy, the main indicator that will be used to explain the main output of economic activity, which relates to the Gross Domestic Product (GDP), is the input indicator Investment or Gross fixed capital formation (GFCF). Economic growth models attempt to explain economic growth (GDP or GDI: Gross Domestic Income) by looking at investment, or capital accumulation, and labour growth, as well as other factors, such as increases in productivity driven by technological progress. Where GDP or GDI = Y, is expressed by a simple output function of production (Y) depending on inputs: capital (K) and labour (L), epitomised by the economist Robert Solow (1956):

$$Y_t = K_t^{\alpha} \; L_t^{\beta} \qquad K = capital \qquad L = labour \qquad \alpha + \beta = 1$$

Capital Accumulation -> Capital = (Accumulated Capital – depreciation) + Investment

$$K_t = (1 - \delta) K_{t-1} + I_t$$

Investment, or GFCF, is defined as the acquisition and production of assets that are intended for use in the production of other goods and services for a period of more than one year. The term "produced assets", refers to the idea that only those assets which are produced as a result of a production process are included. This means that the purchase of land and natural resources are not included (see, for example, OECD, 2023).

$$I_t = K_t - K_{t-1} (1 - \delta)$$

Various indicators to measure GFCF are available. These usually either use current prices in US dollars in 2005 PPP (such as the OECD) or Euro (as is the case in Eurostat). In order to measure at the comparative level per country or economy, two methods could be used. The first approach is to measure Investment or GFCF per country (region or economy) in US dollars at 2005 dollars PPPs (Purchasing Power Parities: OECD 2003). The second, more indicative method, is to measure Investment or GFCF as a proportion of GDP both at the same unit (as is the case of OECD practice, in US dollars 2005 PPPs). Another approach is to consider dynamic performance. This is measured by the annual growth rate of GFCF in US dollars or Euro at a common constant currency. However, these values are not necessarily suitable for comparison over time, since changes are not only caused by real growth but also by changes in domestic prices and, or exchange rates.

Growth models have evolved and have taken in into account other significant factors, such as technology, innovative knowledge, and human capital (in particular, R&D personnel, Romer 1990, Barro & Lee 2001, Jedwab et al. 2023). This is particularly the case when explaining economic growth in developed economies, such as those in the EU and the OECD.

$$Y_t = K_t^{\alpha} \; (A_t L_t)^{\beta} \qquad A = labour\ augmenting\ technology\ or\ knowledge$$

$$Y_t = K_t^{\alpha} \; H_t^{\beta} (A_t L_t)^{1-\alpha-\beta} \qquad K = capital,\ H = human\ capital,\ L = labour$$

Taking this into consideration, we will identify significant variables of investment (GFCF) in R&D, Innovation and ICTs in order to better understand economic growth and competitiveness in OECD economies.

Input results: Input, captured by Investment (measured as GFCF as a percentage of GDP, or, GFCF/GDP) is the key input that explains the main outputs; economic activity and growth. In order to evaluate the evolution of Investment, we take the GFCF/GDP ratio at current prices (US dollars). We follow the established regional classification when presenting national GFCF per region, as seen in Figures 1.1 to 1.5. In Figure 1.6, we compare regional trends.

In Figure 1.1.1, it can be observed how Investment in Western Europe has been the most stable of all regions. The average GFCF/GDP declined by 1.5 points from 2007 to 2010 and then recovered by 2.7 points until 2019. The strongest performances were observed in Switzerland, Austria and Belgium, whilst the weakest performances were seen in the UK and Luxembourg. The clear exception to the stability of the region was found in Ireland. Here, there was marked, higher volatility, associated with the euro-crisis. In 2007, Ireland was the country with the highest GFCF/GDP 28.7% (of Western Europe). This then fell to 16.7% in 2011, but later went onto to reach an exceptional 54.3% in 2020.

Similarly, Investment was quite stable in Northern Europe (Figure 1.1.2): GFCF/GDP tended to increase, albeit in an irregular manner, between 2007 and 2021. Within this region, Iceland was the country to be most significantly affected by the financial crisis: GFCF/GDP dropped from 29% in 2007 to 15.6% in 2014, after which it continued to slowly recover until 2021, but did not reach the Investment levels equal to those at the beginning of this period (2007). After Iceland, the other country where investment declined most was Denmark. Here, GFCF/GDP fell by 5 points during the crisis of 2007-2012, after which, recovery occurred, but again, levels comparable to 2007 were not reached. The strongest performers in this group were Norway, Sweden and Finland.

Southern Europe was the region to most clearly suffer declines in Investment during this period (Figure 1.1.3). All of the countries in this region saw dramatic falls in GFCF/GDP from 2007 in parallel with the unfolding of the financial crisis. Spain fell from 27.8% in 2007 to a low point of 17.4 GFCF/GDP in 2013, after which it recovered partially, remaining at less than 20% by 2021. Portugal and Italy followed a similar pattern to Spain. Malta performed the best out of this group of countries; though GFCF/GDP fell from 22.5% in 2007 to 16.5% GFCF/GDP in 2013, the country underwent a strong, albeit somewhat irregular, recovery to 22% by 2021. Greece was the weakest performer in this sense: investment plunged from 26% in 2007 to around 10% of GFCF/GDP between 2012 and 2019, after which, only small improvements occurred, leaving Greek investment and growth capacity very low.

The effects of the financial crisis, as seen in Southern Europe, are also observed in the case of Central Eastern Europe, with the difference that, generally speaking, the partial recovery was stronger (Figure 1.1.4). Overall, Estonia was the strongest performer of this latter group of countries, though GFCF/GDP fell from around 28% in 2007 to 23% GFCF/GDP in 2011. By the end of the period (2021), investment in Estonia actually increased to 28.9%. Most countries in this country group only managed to partially recover up to their 2007 investment levels by 2021, and the gap between initial and final investment rates remained significant. By way of example, Romania fell from 35.3% in 2007 to 24.1% GFCF/GDP by 2021, whilst Lithuania fell from around 28% to 21.4% GFCF/GDP in the same time period. The poorest performer in this group was Poland, whose investment fell from 23.1% in 2007 and stagnated from 2010 onwards, around the 17% GFCF/GDP level.

In the case of Oceania & North America, the effects of the financial crisis on investment were observed to be mild with relatively consistent recoveries (Figure 1.1.5). Canada and New Zealand performed best in that their initial investment rates (23.5% and around 24% GFCF/GDP respectively) in 2007 both recovered to 24% GFCF/GDP by 2021. The United States largely recovered initial investment rates (22.3% GFCF/GDP in 2007, which fell to 18.3% in 2010, but then rose again to 21.2% GFCF/GDP by the end of the period). Australia was the weakest performer in this group, since recovery was partial, from 27.6% in 2007 to 22.9% GFCF/GDP by 2021.

In Figure 1.1.6, average performance of all the regions are combined. Here, the country performances described above are very clear: given the financial crisis, all regions considered experienced strong, albeit partial, recovery across the period: Northern Europe recovered 2007 investment rates by 2021, whilst Oceania, Western Europe, North America and Central & Eastern Europe made strong, albeit not complete, recoveries. The poorest region in this regard is clearly Southern Europe, with average investment dropping from 24% in 2007 to only 19.5% GFCF/GDP by 2021.

Figures 1.1.1 - 1.1.6: Investment in the countries under study, measured as GFCF as a percentage of GDP (GFCF/GDP)

Fig 1.1.1 GFCF in Western Europe (% GDP)

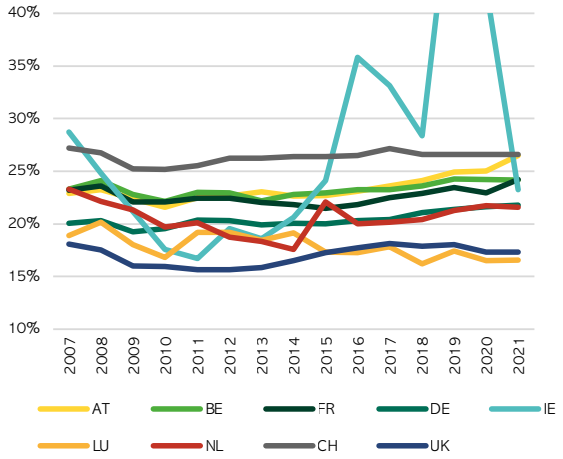


Fig 1.1.2 GFCF in Northern Europe (% GDP)

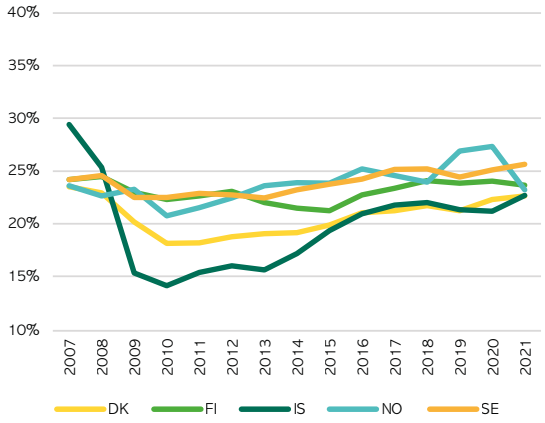


Fig 1.1.3 GFCF in Southern Europe (% GDP)

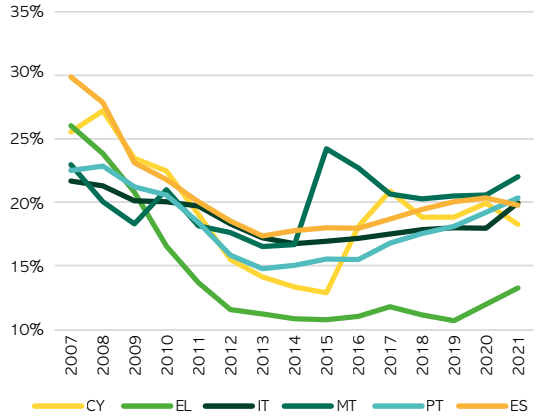


Fig. 1.1.4 GFCF in Central & Eastern Europe (% GDP)

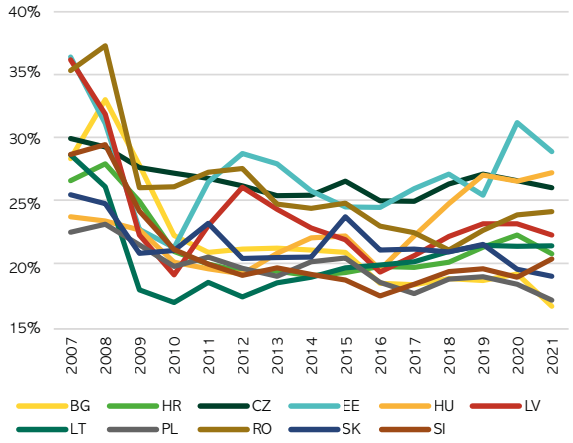


Fig 1.1.5 GFCF in Oceania & North America (% GDP)

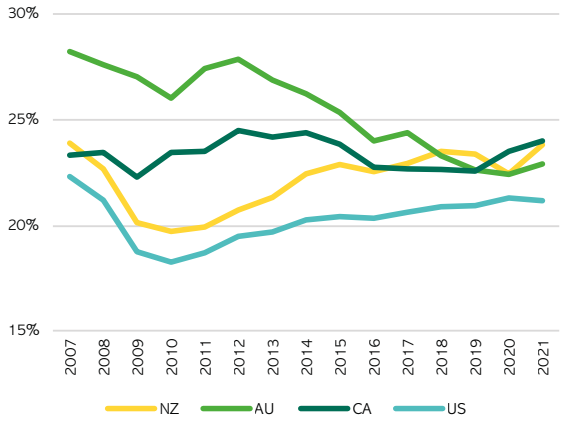
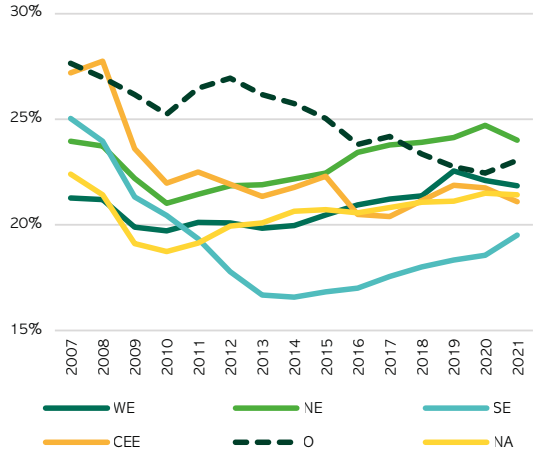


Fig 1.1.6 GFCF by regions (% GDP)



Source: Authors' elaboration based on OECD (2023) Investment (GFCF)

3.2.3. Activity

Investment is a core indicator for overall performance at the Economy level (GDP). However, it is also important to distinguish who, or which actor, is conducting the Investment (GFCF), and into which sector or asset the Investment is being made. As regards actors, Investment can be measured according to whether it is made by the Government (Figures 1.2.1-6), Corporations (mainly in the private sector, see Figures 1.3.1-6), or Households (see Figures 1.4.1-6). Government investment is generally understood as investment in R&D, military weapons systems, transport infrastructure and public buildings, such as schools and hospitals. The 2008 System of National Accounts (SNA) treats all military expenditures on fixed assets as GFCF regardless of the purpose. This indicator is measured as a percentage of the total GFCF. In this study, Government investment is extracted from OECD (2023).

In terms of the contribution of each actor to total GFCF or Investment, the most important sector is Corporate Investment. For the period between 2007 and 2021, this contributed on average for all countries around 59.3%, with a maximum of 75.1% in Ireland and 72.4% in Switzerland, and minimums of 44.6% in Greece and 47.1% in Canada. In second place of importance is Household: for the period 2007-2021 the average for all countries was 23.4%, with maximum levels of 36% in Canada, 33% in Australia and 32.1% in Italy, and minimums of 13.2% in Sweden and 13.9% in Ireland. Government investment for the same period contributed on average for all countries around 17.4%, with a maximum of 27.4% in Greece, 23.4% in Poland and 20% in Norway, and minimums of around 10-11% in Belgium, Germany, Ireland and Switzerland.

The evolution of the contribution of each actor to GFCF was irregular. It is therefore important to examine how this has evolved by region and country, to facilitate comparison and identify possible common patterns.

In Figure 1.2.1, we can see that Government Investment in Western Europe has held at a relatively stable level, at around 2.9% of GDP. Indeed, this is the most stable result of all the European regions. The average Government investment/GDP declined 0.55% from 2008 to 2016, and then recovered by 0.4% points by 2020. The best performance regarding Government Investment was observed in Luxemburg, France and the Netherlands, whilst the poorest performances were seen in Belgium, Germany and Ireland. The clear exception to the stability of the region was found in Ireland, which started with the highest ratio (5.5%) and from 2011 exhibited the lowest ratio of Government investment/GDP at 2%, a trend associated with the euro-crisis.

Government Investment was also quite stable in Northern Europe (Figure 1.2.2): Government Investment/GDP tended to increase in the four observed countries by around 1.2%, but in particular in Norway, where it increased by 2.4% points, between 2007 and 2020.

The countries of Southern Europe were the most affected by government austerity policies during the financial crisis. Government investment/GDP declined from 4.4% in 2009 to 2.2% between 2016 and 2019 (see Figure 1.2.3). Most of these countries experienced a drastic fall in Government Investment/GDP from 2009 (Portugal from 2010), in parallel with the unfolding of the financial crisis. Greece fell from 5.8% in 2009 to a low point of 2.5% in 2012-2013, when it underwent an increase in the ratio given the drastic fall of GDP, and dropped again in 2019. In Spain and Portugal, this indicator dropped from 5.2% and 5.3% in 2009 and 2010 to 2% and 1.5% in 2016, respectively. In both countries, the ratios remained low until 2019, prior to the pandemic. Italy followed with a more moderate pattern than Spain and Portugal, seeing its ratio fall from 3.5% in 2009 to 2.2% in 2019.

The effects of the financial crisis on Government Investment/GDP also affected Central Eastern European countries, with the difference that the region's worst results were observed in 2016, exhibiting some lag, since recovery elsewhere had already started. Overall, there were no significant differences across countries in this group: Estonia was the strongest performer with Government/GDP around 5.4% across the whole period, with a minimum of 4.6% in 2016. The weakest performer was Czechia at 3.7% on average between 2007 and 2021, with a minimum level of 3.4% in 2016. In general, most of these countries – with the exceptions of Hungary and Poland - had not recovered by the end of the period between 2019-2021, when compared with Government Investment/GDP before the financial crisis.

With respect to Oceania & North America, the effects of the financial crisis on Government investment/GDP were relatively smoother than in Europe (see Figure 1.2.5). Australia performed best in terms of Government Investment/GDP, with an increase from 3.2% in 2007 to 4% in 2019. New Zealand and Canada largely maintained their initial Government investment ratios of 4% and 3.7% in 2007 to 4.4% and 4.2% in 2019, respectively. The United States

also maintained its Government investment at around 3.5% across the whole period between 2007-2021, with a peak of 4.2% in 2019 and a low of 3.2% in 2015-2017.

The average performance of all the regions are presented in Figure 1.2.6., where, the group performances described above become more evident. Government Investment/GDP increased in Northern Europe, while it was relatively stable in Western Europe, Oceania and North America. The financial crisis affected all regions but, in particular, hit Southern Europe hardest. This region declined from 4.2% in 2009 to 2.2% in 2016-2019. The crisis also affected Central and Eastern Europe, though in a different way. The negative effects of the crisis affected the region with a lag, compared to elsewhere, which could also be said to have delayed the regions' recovery.

Figures 1.2.1 - 1.2.6: Government Investment in the countries under study, measured as a percentage of GDP

Fig. 1.2.1 Government Investment, Western Europe

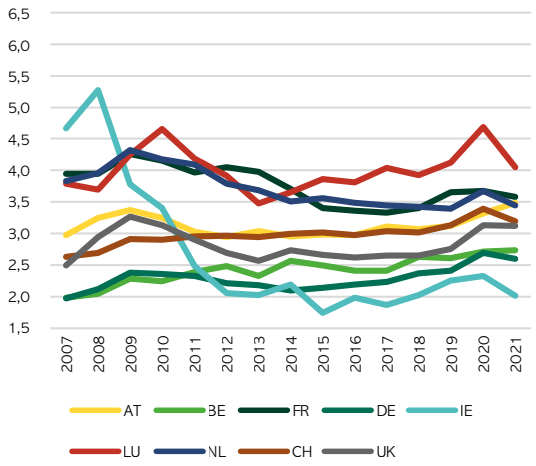


Fig. 1.2.2 Government Investment, Northern Europe

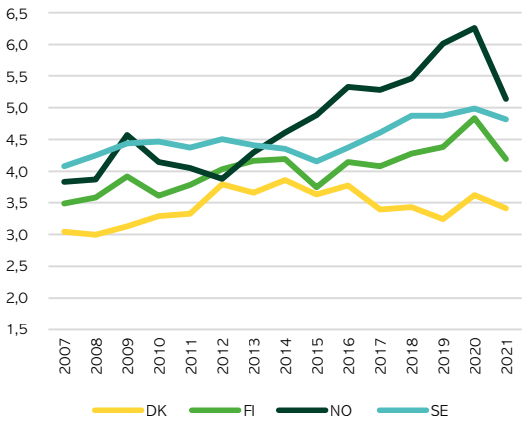


Fig. 1.2.3 Government Investment, Southern Europe

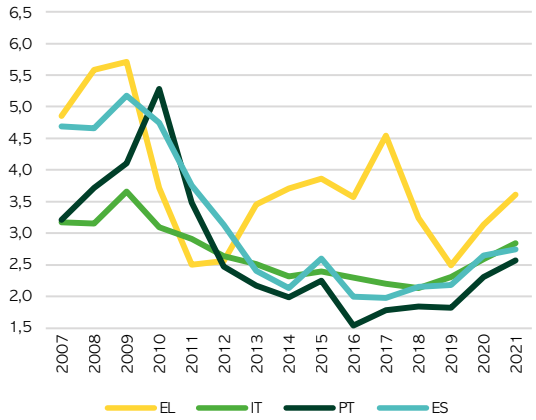


Fig. 1.2.4 Government Investment, Central and Eastern Europe

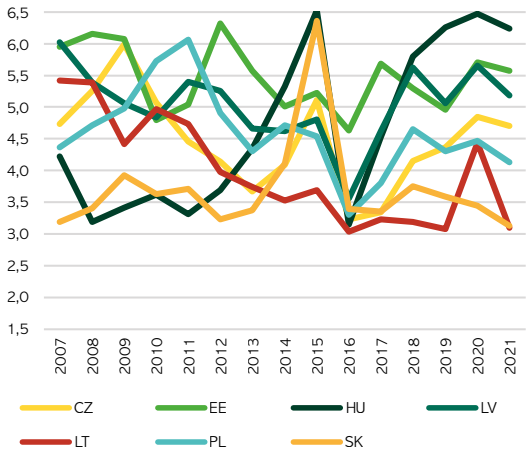


Fig. 1.2.5 Government Investment, Oceania and North America

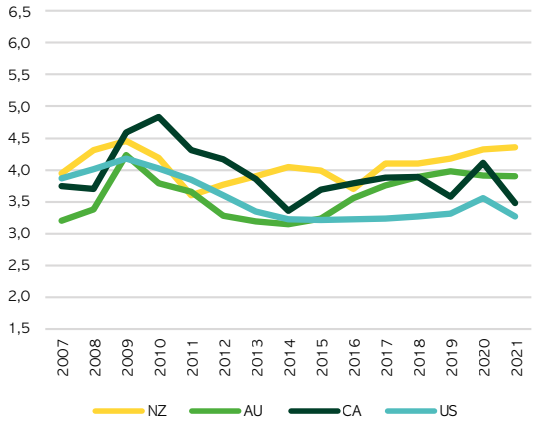
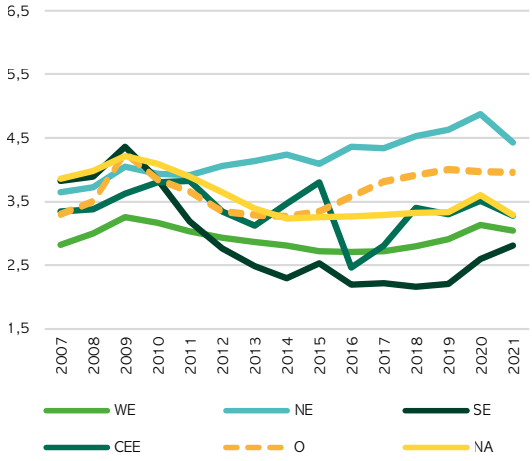


Fig. 1.2.6 Government Investment by region



Source: Authors' elaboration based on OECD (2023) Investment (GFCF)

The Corporate Investment/GDP ratio in Western Europe is presented in Figure 1.3.1. This figure remained at a relatively stable level of around 12.4%. This was the only region of the countries considered in this report where the average Corporate investment/GDP actually increased, in this case, by 0.85% between 2008 and 2020. The weakest performances were observed in Luxembourg, the United Kingdom and the Netherlands, whilst the best performances were seen in Ireland, Switzerland, Austria and Belgium. The clear exception to the stability of the region was found, again, in Ireland. Ireland started with a low level of corporate investment/GDP in 2007 (12.2%) and surged to an extraordinary record level in 2019 (50.5%). The poorest performance for the whole period between 2007 and 2021 were Luxembourg and the United Kingdom, both with declining trends.

In Northern Europe, Corporate investment/GDP was stable (see Figure 1.3.2). Corporate Investment/GDP observed a maximum peak in 2008, then declined until 2010, and then increased again until 2019. Of the four countries included in this group, in general, there were no significant differences as regards Corporate Investment/GDP in 2007 and 2019 or 2021, with the sole exception of Norway, that observed a decline in 2021.

In Southern Europe, Corporate investment/GDP was affected by the financial crisis, but to a lesser extent than Government investment/GDP and Household investment/GDP had been. In the four observed cases, this ratio declined in Greece, Italy, Portugal and Spain, from 7.8%, 10.9%, 13.4% and 15.5% in 2007 to 4.5%, 8.9%, 9.4% and 11.9% in 2013, respectively. In all cases, the ratios increased from 2013 to 2019 (and again, to 2021 in all countries, with the exception of Spain). Hence, in general, Corporate investment/GDP was more stable than the other two components of GFCF.

The effects of the financial crisis on Corporate Investment/GDP were also visible in Central Eastern Europe countries, with the difference that these effects were more irregular. The year 2010 saw the lowest values for this indicator. There were significant differences amongst the countries in this group. Poland was the poorest performer, with Corporate/GDP at 10.4% across on average for the whole period, with a minimum of 8.9% in 2010. The strongest performers were Czechia and Estonia, both with 16.9% on average between 2007 and 2021, with minimum levels of 15.5% and 12.6% in 2010. In general, most of these countries, with the exception of Hungary, had not recovered by the end of the period as regards their levels in 2019-2021 when compared with those levels before the financial crisis of 2007.

In the case of Oceania & North America, the effects of the financial crisis on Corporate investment/GDP were relatively smooth (Figure 1.3.5). Australia performed relatively well in terms of Corporate Investment/GDP during the crisis, with an increase from 12.3% in 2008 to 17.2% in 2012, which was then followed by a decline to 11% from 2016 to 2021. Canada and the United States maintained their initial Corporate investment ratios at 11% and New Zealand around 14%, with a decline of around 1.4% between 2007 and 2019.

The average performance of all the regions are presented in Figure 1.3.6. Between 2007 and 2019, Corporate Investment/GDP increased only in Western Europe, and was relatively stable compared to the other actors (Government and Households) in all the other regions with the exception of Oceania (which is dominated by Australian performance). The financial crisis affected all regions, most markedly Southern Europe, but its effect on Corporate Investment/GDP was relatively moderate in comparison to Government and Household investment/GDP. For Central and Eastern Europe countries, Corporate Investment/GDP was less volatile than the Government investment/GDP.

Figures 1.3.1 - 1.3.6: Corporate Investment in the countries and regions under study, measured as a percentage of GDP

Fig. 1.3.1 Corporate Investment Western Europe

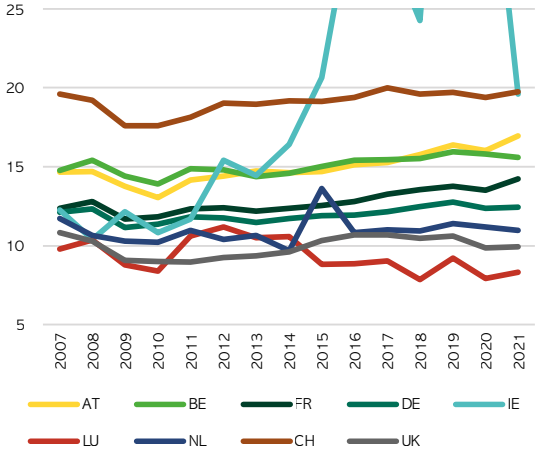


Fig. 1.3.2 Corporate Investment Northern Europe

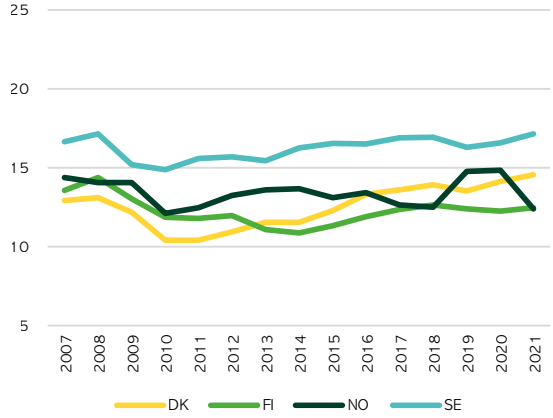


Fig. 1.3.3 Corporate Investment Southern Europe

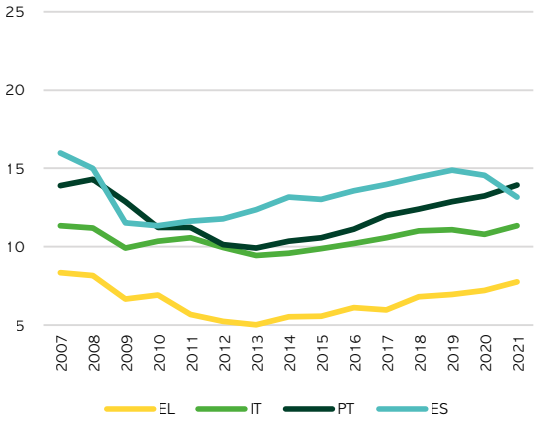


Fig. 1.3.4 Corporate Investment Central and Eastern Europe

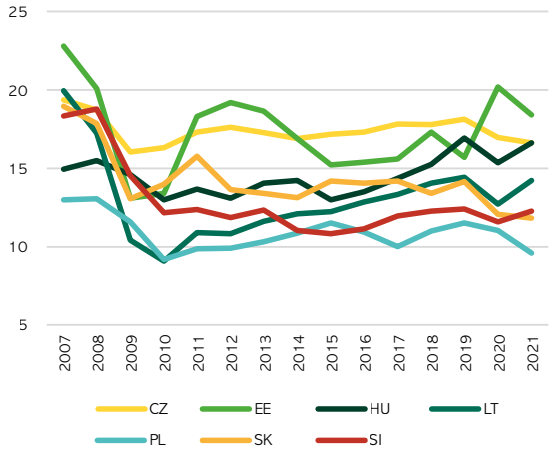


Fig. 1.3.5 Corporate Investment Oceania and North America

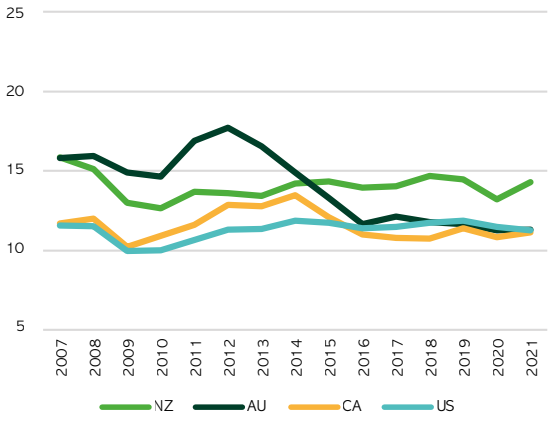
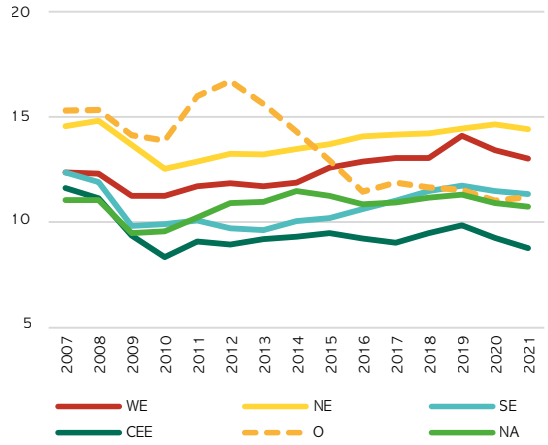


Fig. 1.3.6 Corporate Investmen by Region



Source: Authors' elaboration based on OECD (2023) Investment (GFCF)

Household Investment/GDP in Western Europe is seen in Figure 1.4.1. Here, the ratios remained largely stable, at around 5.5 %, with only some fluctuations, the obvious exception in this group of countries being Ireland. Though the region's average Household investment/GDP decreased 0.3% over the period between 2007 to 2021, this reduction was smaller than those experienced in the other regions. The average of all countries in this group, except Ireland, was between 4.2% in the UK and 6.9% in Germany. All countries, except Austria and Germany, saw reductions in Household Investment/GDP from 2007 to 2021 (from -0.4% in the case of Belgium to -1.2% in the case of Switzerland). As the figure clearly shows, the most drastic decline took place in Ireland, which, in 2007, had a Household investment/GDP of 11.8%. This dropped to the lowest record of this group between 2010 and 2021, to around 1.5%.

Household investment/GDP was also quite stable in Northern European (see Figure 1.4.2). Household Investment/GDP was, on average, 4.7% for the period, with a maximum in 2007, then a decline until 2014, followed by a recovery until 2021 in three countries and until 2017 in Norway. In Sweden and Norway, there was an increase of around 0.23% until 2019 but, in the case of Denmark, there was a significand reduction by 2.9% points, from 7.6% in 2007 to 3.7% in 2014. The Danish indicator remained low, at around 4.5% until the end of the period (2019-2021).

In Southern European Household investment/GDP was clearly affected by the financial crisis. In the four observed countries, the ratio declined in Greece, Italy, Portugal and Spain from 13.3%, 7.6%, 5.9% and 9.7% in 2007 to 1.9%, 5.2%, 3.2% and 2.9% in 2015, respectively. In all cases, the ratios increased from 2013 to 2021 but they were far below the 2007 levels (11 points in Greece and 5 points in Spain).

The effects of the financial crisis on Household Investment/GDP also affected most of the Central Eastern Europe countries. In Estonia and Latvia, Household Investment/GDP dropped from 8.1% to 3.5% and 7.6% to 2.4 from 2007 to 2010, respectively. Meanwhile, in Czechia and Poland, the decline of this indicator extended until 2016 and 2018, respectively. In general, in most countries, with the exception of Slovakia, Household/GDP was lower in 2019 than in 2007, with reductions ranging from -0.7 in Hungary to -4.6% in Latvia.

In the case of Oceania and North America, the effects of the financial crisis on Household investment/GDP were diverse (see Figure 1.4.5). All the countries in this group underwent a decline in household Investment/GDP between 2007 and 2011.However, New Zealand and Canada recovered, reaching ratios of 1.5% and 1% higher at the end of the period when compared with those in 2007. The United States nearly recovered the 2007 level in 2021 (only 0.26% lower). Australia was more irregular in terms of Household Investment/GDP during the crisis, recovering from 2011 to 2017 but declining again to a minimum of 7.5% in 2019 (-2.2% lower than in 2008).

The average performance of all the regions are presented in Figure 1.4.6. Between 2007 and 2021, Household Investment/GDP declined in all the observed groups. However, recovery by the end of the period was either achieved or largely achieved in all groups, with the clear exceptions of South Europe and Central and Eastern Europe (and Australia). It is also important to observe that the effects of the crisis on Household Investment/GDP was relatively moderate in comparison to its effects on Government investment/GDP.

Figures 1.4.1-1.4.6: Household Investment in the countries under study, measured as a percentage of GDP

Fig 1.4.1 Household Investment in Western Europe (% GDP)

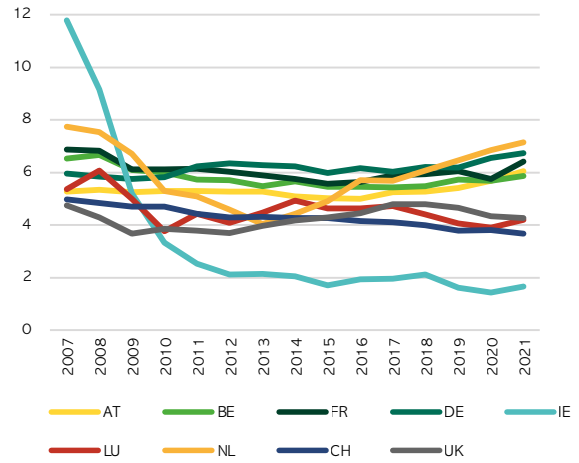


Fig 1.4.2 Household Investment in Northern Europe (% GDP)

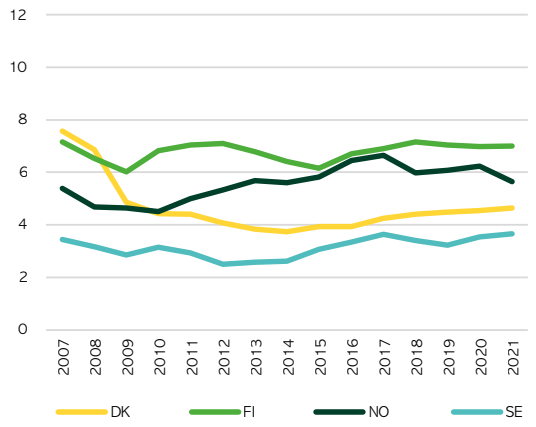


Fig 1.4.3 Household Investment in Southern Europe (% GDP)

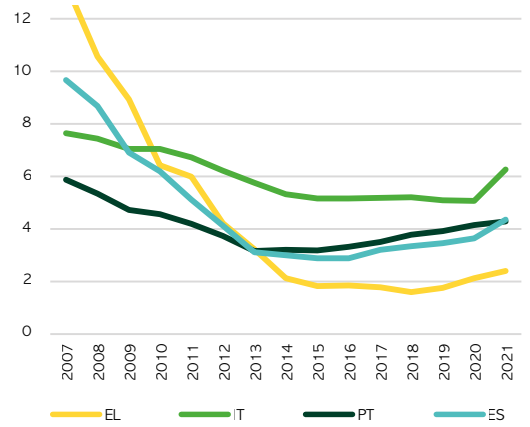


Fig 1.4.4 Household Investment in Central & Eastern Europe (% GDP)

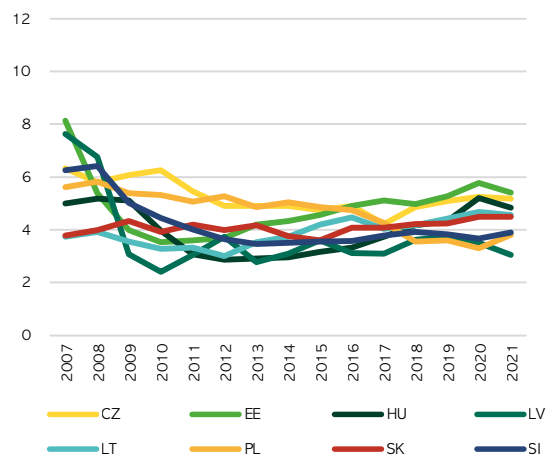


Fig 1.4.5 Household Investment in Oceania and Northern America (% GDP)

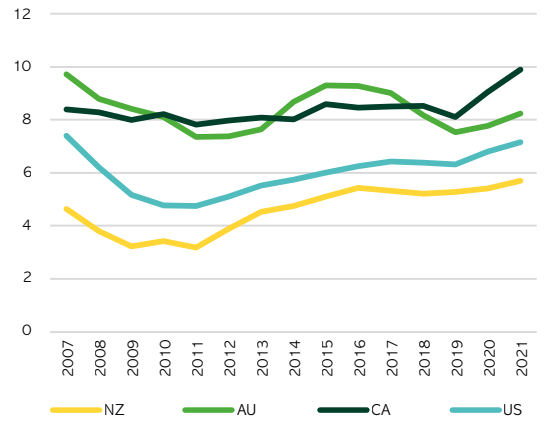
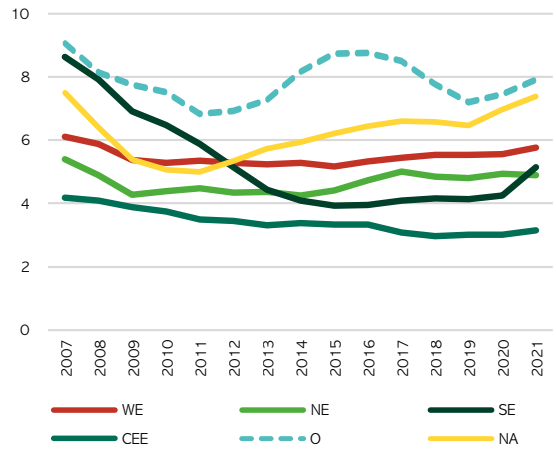


Fig. 1.4.6 Household Investment by Region (% GDP)



Source: OECD 2023

3.2.4. Outputs

Staying at the general level of the Economy, the most common, standard indicator of economic performance is Gross Domestic Product (GDP), which is similar to Gross Domestic Income (GDI). GDP is the standard measure of the value added created through the production of goods and services in a country during a certain period of time. As such, it also measures the income earned from that production. For the purposes of this study, the GDP indicator will be extracted from OECD (2023).[1] The advantage of the GDP indicators derived from OECD (2023) is that the comparison of the 35 countries under study is facilitated. At the same time, the data facilitates a comparison across country blocks, including Western Europe and the EU, in addition to specific regions, such as, within the EU and the Euro-area. GDP (or GDI) is measured in common currencies (US dollars in the case of the OECD and Euro in case of Eurostat) in constant prices or PPP (OECD and World Bank). To facilitate comparison across countries, we use the GDP per capita or inhabitant (GDP/Total Population). The dynamic performance or evolution of GDP over the longer term can be captured using GDP growth per year, in periods ranging from 2, 3 or 10 years.

Output Results
Output GDP is the main output indicator for economic activity. To comparatively evaluate the evolution of economic activity, we first consider GDP per capita expressed in US dollars during a period of low inflation (2% annual average in the OECD and 1.5% in the EU from 2007 to 2020), which reflects the evolution of the examined economies at current and constant prices.

Following the regional classification of countries, Figures 2.1 to 2.5 show the national GDP per capita of countries in their respective regions, whilst Figure 2.6 presents the regional average trends.

Starting with Western Europe (Figure 2.1), it is clear GDP per capita increased for all countries. The Netherlands, Germany, the UK, Belgium, France and Switzerland tended to present similar increases. The two strongest performers were Luxembourg, whose GDP per capita increased from nearly USD 85,000 to over USD 100,000 and Ireland, which shot up from USD 44,105 to over USD 106,852 (this goes off the graph) between 2007 and 2021.

In Northern Europe, GDP per capita in Denmark, Iceland, Sweden and Finland also increased from around USD 40,000 in 2007 to between USD 55,000 and USD 65,000 by 2021. The strongest performer in this region was Norway, which jumped from USD 61,719 to USD 80,496 in the same period (Figure 2.2).

In Southern Europe, GDP per capita increased for all countries with the exception of Greece (Figure 2.3). Italy, Cyprus, Spain, Malta and Portugal all observed increases from a range between USD 25,736 (Malta) and USD 35,293 (Italy) in 2007 to USD 48,726 (Malta) and USD 36,715 (Portugal) in 2021. Greece performed worst, seeing a nearly stagnant GDP per capita over the period, increasing only from USD 30,856 in 2007 to USD 31,177 in 2021.

As regards Central and Eastern Europe, all countries in this region observed increases in GDP per capita, with initial amounts in 2007 ranging from USD 12,621 (Bulgaria) to USD 29,595 (Slovenia) to USD 43,970 (Slovenia) to USD 26,793 (Bulgaria). The two strongest performers in this group were therefore Slovenia and Czech Republic, and the poorest performer was Bulgaria (Figure 2.4).

Finally, for Oceania and North America, the US was the strongest performer, GDP per capita increasing from USD 48,498 to USD 70,181 over this period. Australia also performed quite strongly, seeing a rise from around USD 40,000 in 2007 to nearly USD 62,000 in 2021. Canada showed an intermediate performance, and the weakest performer in this group being New Zealand, whose GDP per capita increased from USD 29,274 in 2007 to USD 47,045 between 2007 and 2021 (Figure 2.5).

[1] For details on the Gross domestic product (GDP) (indicator) see doi: 10.1787/dc2f7aec-en (last accessed on 2 April 2023).

Figures 2.1 - 2.6: GDP per capita in the countries under study (US dollars)

Fig 2.1 GDP per capita in Western Europe (USD)

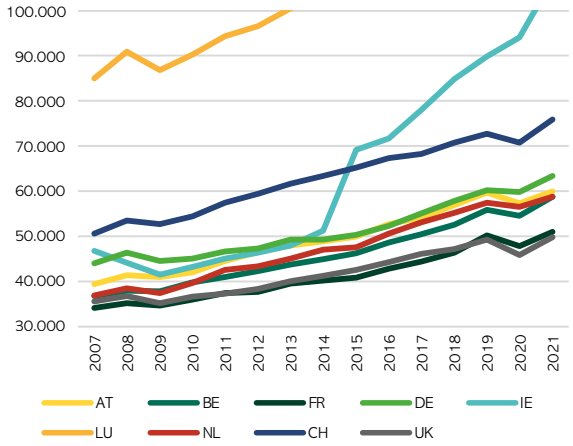


Fig. 2.2 GDP per capita in Northern Europe (USD)

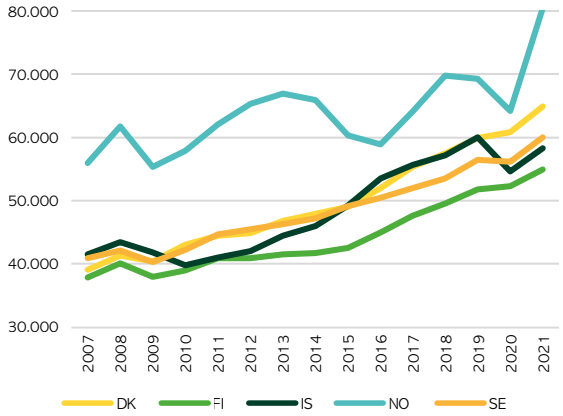


Fig 2.3 GDP per capita in Southern Europe (USD)

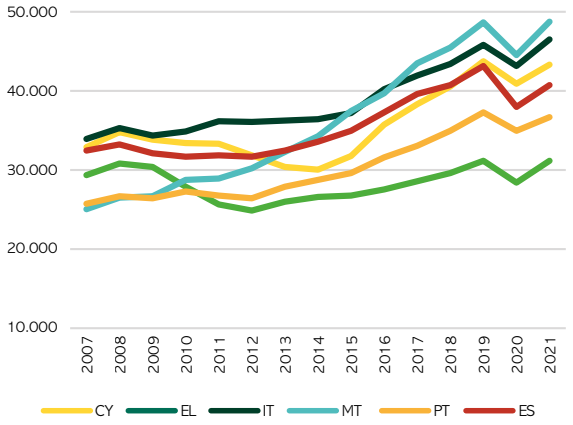


Fig 2.4 GDP per capita in Central and Eastern Europe (USD)

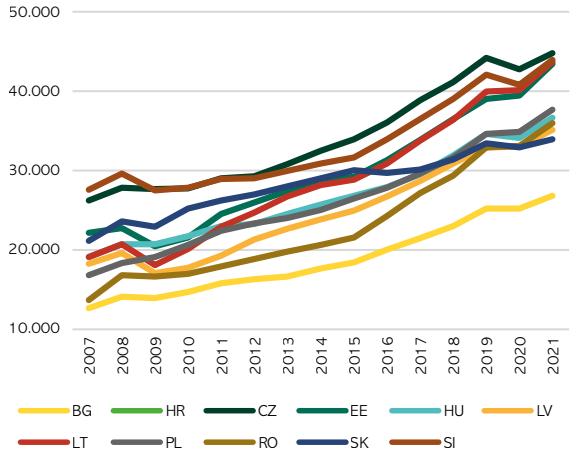


Fig. 2.5 GDP per capita in Oceania and North America (USD)

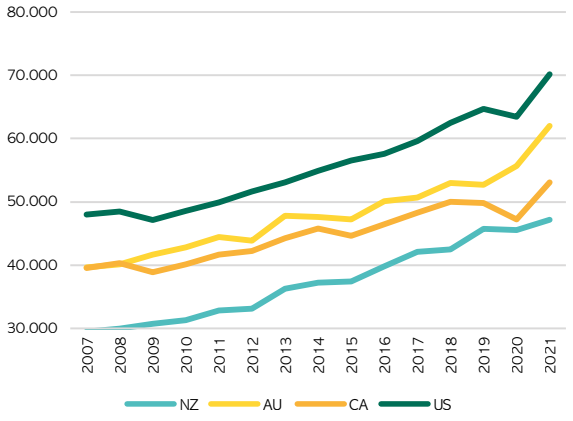
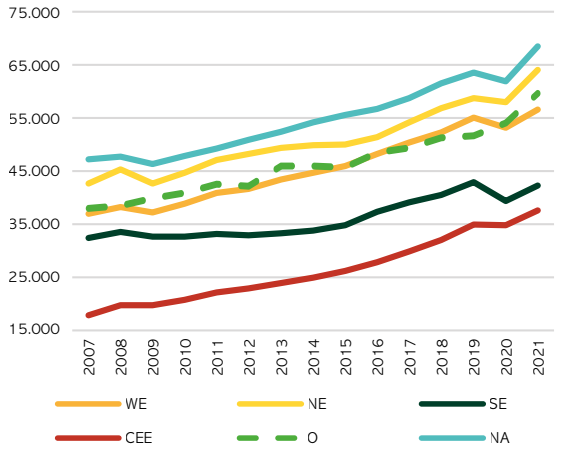


Fig. 2.6 GDP per capita by regions (USD)



Source: Authors' elaboration based onOECD (2023)

When considering GDP per capita using constant prices (USD in 2015), results are predictably rather different. For Western Europe (Figure 3.1), performance of all countries is relatively flat, with the exception of Ireland, which shows a dramatic rise from USD 52,228 to USD 87,340. Similarly, in Northern Europe, (Figure 3.2), GDP per capita where constant prices are flat; the period of the financial crisis is accompanied by a small decline which, by the end of the period, has been recovered. Southern Europe, as a region, performs the worst of all groups (Figure 3.3). Assuming constant prices, GDP per capita falls for Italy, Spain and Greece, who only attain a partial recovery by the end of the period. Cyprus' recovery is complete, with GDP per capita even increasing modestly by the end of the period. The weakest performer is Greece, which experienced a steep fall from USD 23,929 to USD 18,908 by the end of the period. In the case of Central and Eastern Europe (Figure 3.4), GDP per capital in constant prices rose, though quite modestly, for all countries. The best performer in this group was Slovenia, and the weakest, Bulgaria. Finally, in the case of the group of countries in Oceania and North America, both the United States and Australia are the strongest performers, with Canada and New Zealand exhibiting only modest gains in this indicator during the period (Figure 3.5).

Figures 3.1 - 3.6: GDP per capita in the countries under study (measured in USD constant 2015 prices)

Fig. 3.1 GDP per capita in Western Europe (2015 USD)

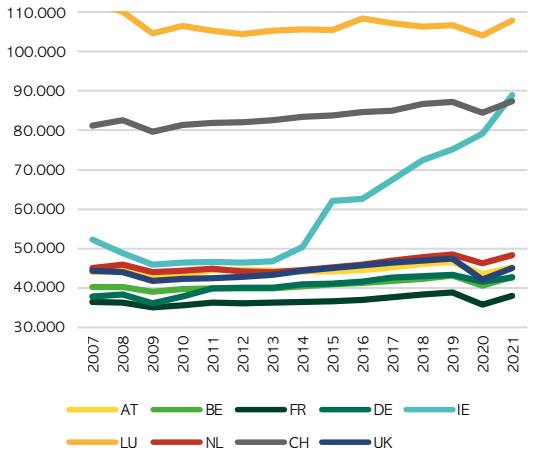


Fig. 3.2 GDP per capita in Northern Europe (2015 USD)

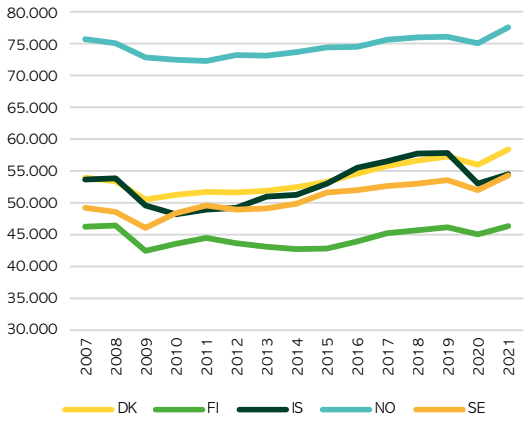


Fig. 3.3 GDP per capita in Southern Europe (2015 US dollars)

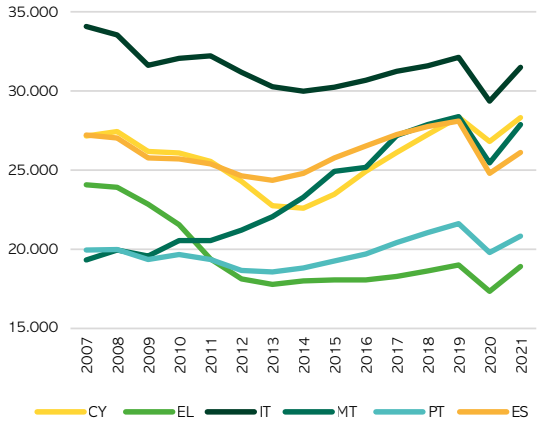


Fig. 3.4 GDP per capita in Central and Eastern Europe (2015 USD)

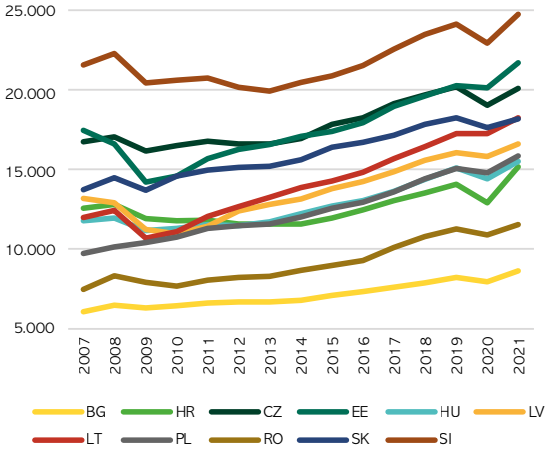


Fig. 3.5 GDP per capita in Oceania and North America (2015 USD)

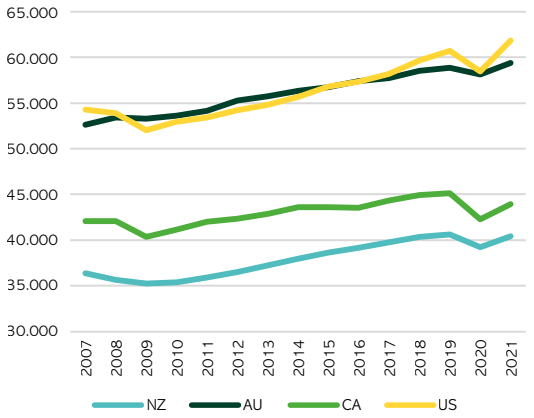
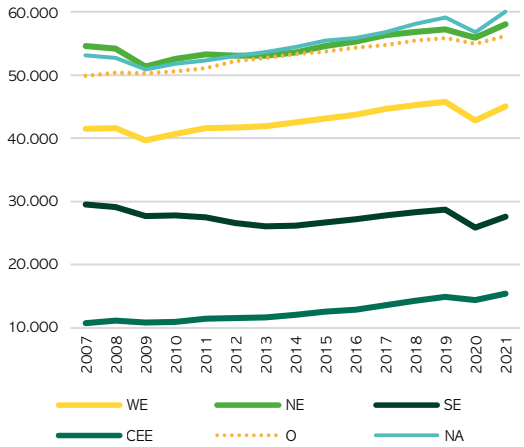


Fig 3.6 GDP per capita by regions (2015 USD)



Source: Elaborated by the authors using World Bank (2023) World Development Indicators.

3.2.4.1 Input – Output (Correlations)

The first step to analyze Economic outcome is to examine the long-term correlations between a key input (Investment or GFCF) and economic output (GDP). This can be described as:

GFCF –> GDP

Y = Y(I)

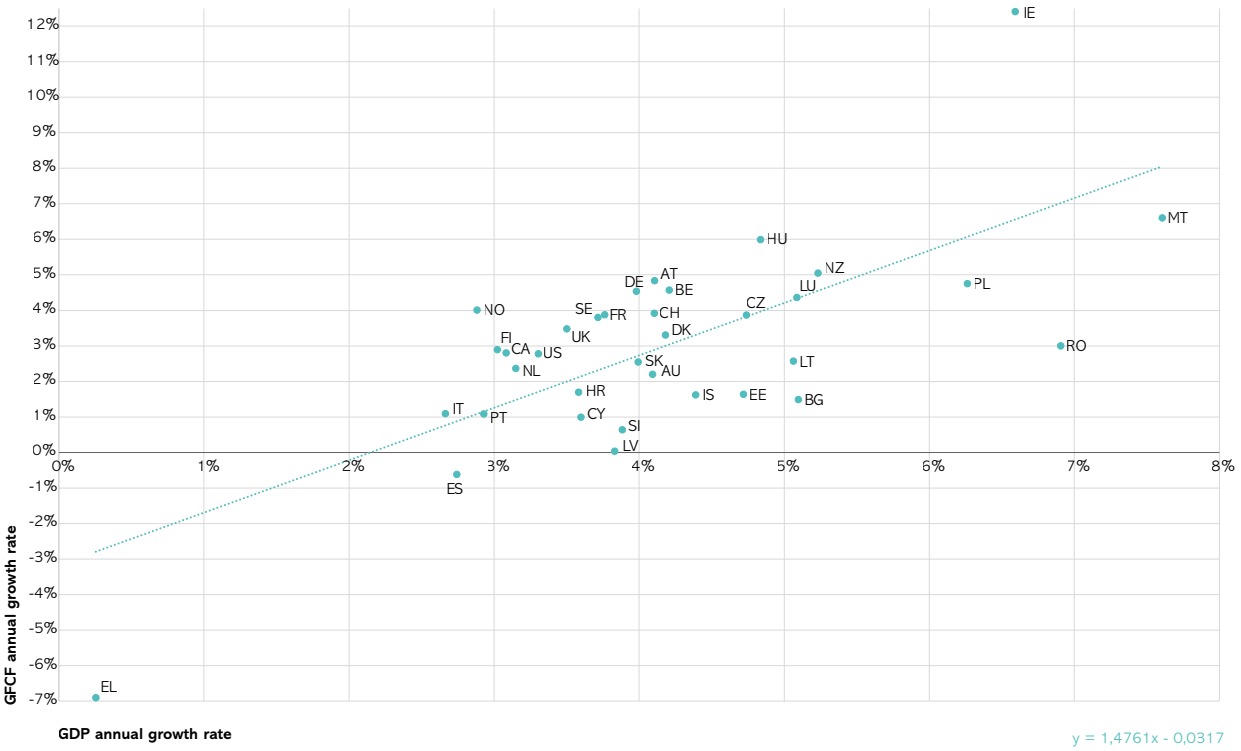
We start by examining the correlation between the annual average rate of growth of the core input indicator, GDP and Investment (GFCF), between 2007 and 2021 (the last available year of data). Here, we observe a positive correlation between high and low performance economies, such as Ireland (IE) and Malta (MT), as high performers, and Spain (ES) and Greece (EL), as poor performers (Figure 3.7). Generally speaking, economies in Central and Eastern Europe exhibited stronger annual growth rates in their economic indicator (GDP) than in Investment (GFCF), whilst Western and Northern European economies, as well as North American economies, exhibited higher annual growth rates in Investment than GDP. Investment was more effective in the Eastern European countries.

Figure 3.7: GDP and GFCF annual growth rates 2007-2021

Source: Elaborated by the authors using OECD (2023) and World Bank (2023)

Given the environment affected by the COVID-19 pandemic, as discussed in section 5.2.1, we examine the correlation between the GFCF and GDP series before the pandemic, that is, the period between 2007 and 2019 (see Figure 3.8). The objective of this exercise is to check for structural breaks in the series of GFCF and GDP, which could predict different trends across the period 2007-2021. The results again show a positive but, in this case, higher, correlation between GFCF and GDP annual growth rates. This can be explained by a relatively higher level of investment than economic activity (GDP) before 2019 than after the pandemic (Figure 3.8).

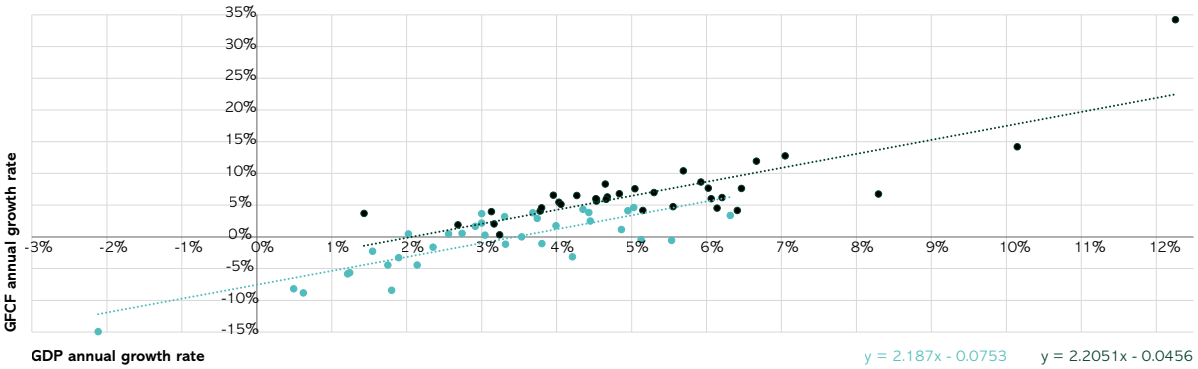
Figure 3.8: GDP and GFCF annual growth rate, 2007-2019



Source: Elaborated by the authors using OECD (2023) and World Bank (2023)

In order to observe the possible structural breaks during the period between 2007-2019, we divide the correlation test of the series (GFCF and GDP) into two sub-periods. The first sub-period corresponds to the financial crisis (2007-2013) and the second sub-period, to the recovery (2013-2019). The equations' estimations for both periods showed similar results in terms of the slope of the correlations lines, but with different intercepts: the annual growth rates of Investment (GFCF) and GDP correlate across the whole period with a structural change. This could also be explained by the policies applied in the second sub-period (2013-2019), in particular, in the EU context, as regards policy interventions such as the EFSI, as mentioned in the discussion of the Environment, in section 5.2.1.

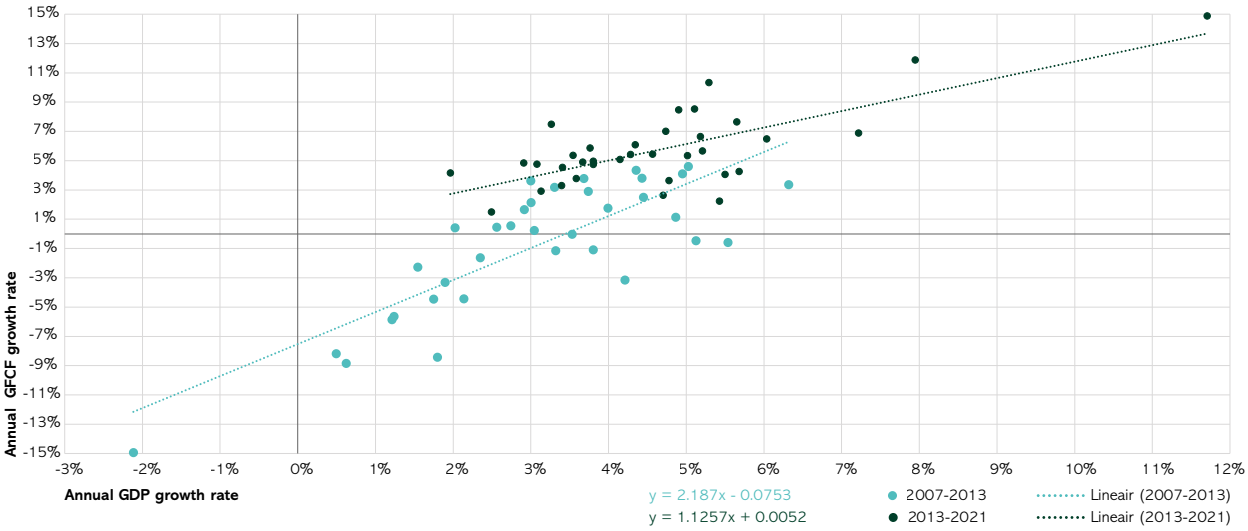
Figure 3.9: GDP and GFCF annual growth rates 2007-2013 and 2013-2019



Source: Elaborated by the authors using OECD (2023) and World Bank (2023)

Finally, we check for correlations between annual growth rates in Investment (GFCF) and GDP during the whole considered period from 2007-2013 and from 2013-2021. We observe a structural break as a result of the pandemic with a relative decline in Investment in terms of economic activity (GDP).

Figure 3.10: GDP and GFCF annual growth rates 2007-2013 and 2013-2021



Source: Elaborated by the authors using OECD (2023) and World Bank (2023)

3.2.5. Outcome

Whilst GDP is the single most important indicator to capture a country's performance at the general Economic level, it falls short of providing a suitable measure of peoples' material well-being. In this regard, alternative indicators may be more appropriate.

Alternative means of capturing outcomes beyond GDP itself have been suggested, for example by Krugman (1994). His work demonstrated that a country's ability to improve its standards of living over time depends on its ability to grow its output (GDP) per worker or *GDP/L*. This is the first indicator used in this section.

Beyond this, there are additional methods of capturing outcome including the consideration of GDP per hour worked or *GDP/H*. GDP/H is the second indicator used in this section. Generally speaking, the indicator of GDP per hour worked is considered a more accurate measure of labour productivity than GDP per worker. GDP per hour worked measures how efficiently labour input is combined with other factors of production and used in the production process. Labour input is defined as total hours worked by all persons engaged in production (for a detailed explanation, see "OECD, 2003"). However, this indicator only partially reflects labour productivity in terms of the personal capacities of workers or the intensity of their effort. The ratio between the output measure and labour input depends to a large degree on the presence and/or use of other inputs, such as capital, intermediate inputs, technical, organisational and efficiency change, and economies of scale. This indicator is measured in US dollars at constant prices from 2010 and PPPs (Purchasing Power Parity). This can be expressed as

$$\frac{Y_t}{L_t} = K_t A_t$$

Labour productivity, which depends on the stock of accumulated capital (K_t) and technological knowledge (A_t,) is a key dimension of economic performance and an essential driver of social and economic structural changes and potential improvement in living standards (Kuznets 1972 and Syrquin 2011).

GDP per worker, (***GDP / L***), can be broken down into growth of labour productivity, measured by growth in GDP per hour worked (***GDP / H***), and changes in the extent of labour utilisation, measured by changes in hours per worker (***H / L***). Increases in labour productivity (***GDP / L***) are also the result of other key factors, such as a greater use of capital, an increase in the employment of high-productive workers, general efficiency gains derived of technology and innovation. This is measured by the OECD in US dollars per capita at current PPPs. Formally, this can be expressed as:

GDP / L = (GDP / H). (H / L)
L *= person employed*
H *= hours worked*

GDP per hour worked is a measure of labour productivity. It measures how efficiently labour input is combined with other factors of production and used in the production process. Labour input is defined as total hours worked of all persons engaged in production. Labour productivity only partially reflects the productivity of labour in terms of the personal capacities of workers or the intensity of their effort. The ratio between the output measure and the labour input depends to a large degree on the presence and/or use of other inputs (including capital, intermediate inputs, technical, organisational and efficiency change, economies of scale and so forth). This indicator is measured in US dollars (World Bank 2023: in constant prices 2015 US dollars and PPPs 2017 and OECD 2023: in 2015 US dollars PPPs).

In Figures 4.1 to 4.6, we first examine GDP per employee (*GDP/L*) by economy grouped in their respective regions. In Western Europe, the vast majority of economies evolved in a very similar way in this regard (Figure 4.1). Despite the fact that their *GDP/L* started from different positions, with Ireland in the strongest position and the UK in the weakest, all tended to evolve following a similar pattern. *GDP/L* declined from the financial crisis starting in 2007 to 2009, and then recovered, fully or partially, depending on the economy, and increased modestly until the outbreak of the COVID-19 pandemic. Though all economies declined in 2020, some fared better than others. Switzerland rebounded strongly, ending 2021 with a higher result than in 2007. The weakest economy was the UK, where *GDP/L*, which had recovered in the aftermath of the financial crisis, was significantly negatively affected by the pandemic, seeing a sharp fall in 2020. By 2021, the UK had recovered to its 2007 levels. Ireland and Luxembourg represented two outliers in this group, Ireland's *GDP/L* soaring from 2013, and Luxembourg's declining by 2021, but from very high levels.

In Northern Europe, the evolution of *GDP/L* was less dramatic than in Western Europe with most economies seeing overall increases when comparing 2007 with 2021 results (see Figure 4.2). The financial crisis did negatively affect these economies, but recovery was rapid and stable. Finland was the poorest performer in this group, since *GDP/L* actually fell overall between 2007 and 2021.

Southern Europe is the weakest regional performer as regards *GDP/L* (see Figure 4.3). This region also exhibited greater heterogeneity as regards the evolution of *GDP/L* over the period. Greece was the weakest performer, with its *GDP/L* plummeting from 2007 to 2021, with only very modest improvement after the pandemic in 2021. Portugal and Spain took considerable time to recover from the financial crisis of 2007, only to see these gains lost due to the COVID-19 pandemic, whilst their recovery could start to be observed in 2021. Italian *GDP/L* did not recover after the financial crisis, and was further lowered during the COVID-19 pandemic, with a modest improvement in 2021.

In Central and Eastern Europe, generally speaking, although the financial crisis was accompanied with a fall *GDP/L*, economies recovered and then grew quite steadily, until the COVID-19 pandemic (Figure 4.4). In 2020, all economies were negatively affected, though all the economies made quite strong and rapid recoveries. Poland and Latvia were impressive performers in this regard, seeing an overall strong increase in *GDP/L* across the period. In Oceania and North America, economies were relatively unaffected by the financial crisis as regards *GDP/L*. Moreover, whilst the COVID-19 pandemic negatively affected Canada, Australia and New Zealand's *GDP/L* was steady, whilst that in the US actually increased. The US was the strongest performer in this group, overall (see Figure 4.5).

Looking at all regions comparatively (Figure 4.6), strong performers were Northern Europe and Oceania and North America. Western Europe also performed well, though, it was badly hit by the COVID-19 pandemic. Central and European economies also saw overall growth. The weakest region was Southern Europe, who overall saw elusive recovery after the financial crisis was negatively affected by the COVID-19 pandemic and has exhibited a difficult and ongoing recovery in 2021.

Figures 4.1 to 4.6: GDP per employee in the countries under study (GDP/L) measured in USD PPP

Fig 4.1 GDP per employee in Western Europe

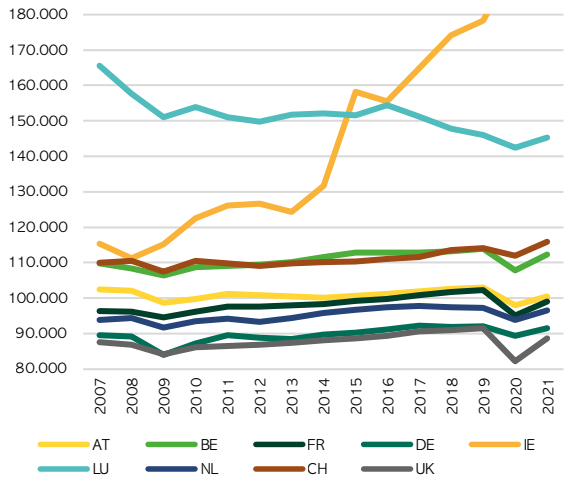


Fig 4.2 GDP per employee in Northern Europe

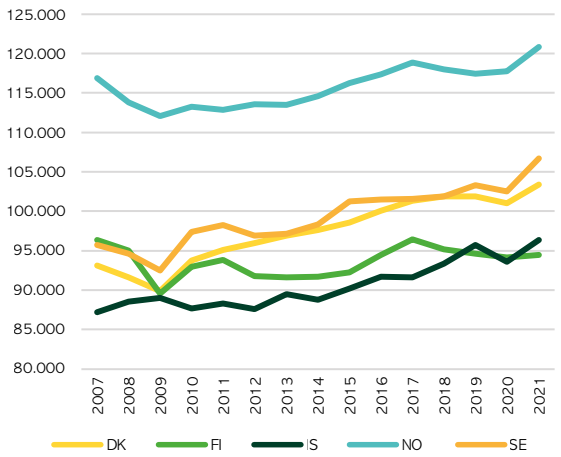


Fig 4.3 GDP per employee in Southern Europe

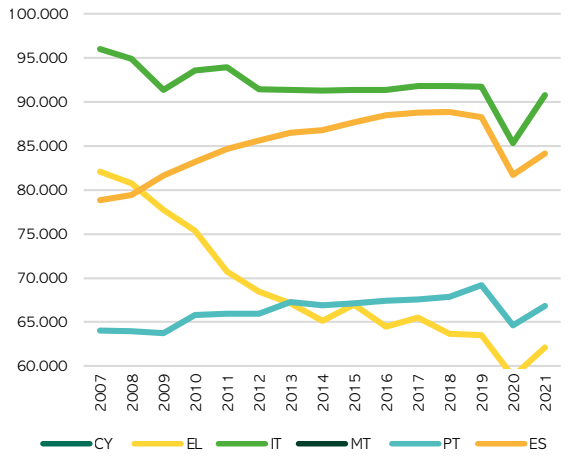


Fig 4.4 GDP per employee in Central and Eastern Europe

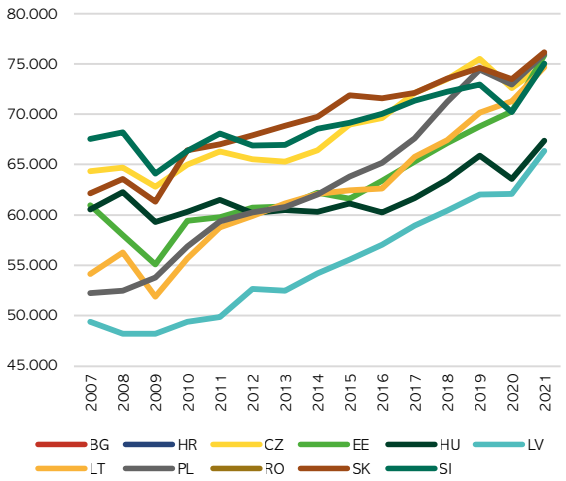


Fig 4.5 GDP per employee in Oceania and Northern America

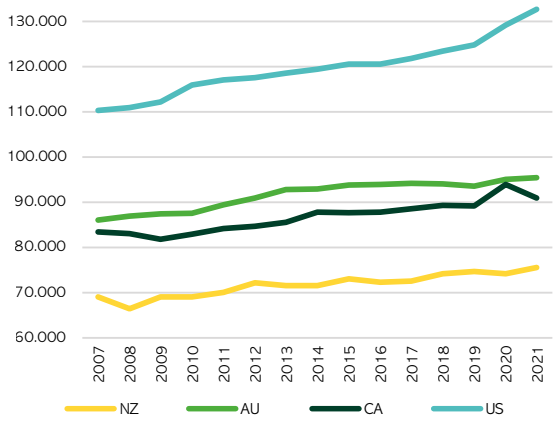
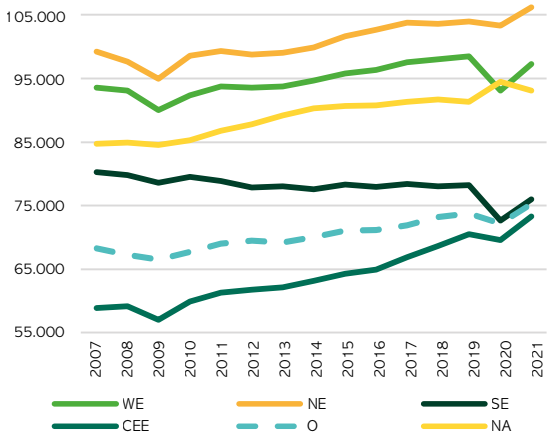


Fig 4.6 GDP per employee by regions



Source: Elaborated by authors using OECD (2023) and Eurostat (2023)

Turning now to examine the second indicator, GDP per hour worked (*GDP/H*) in Western Europe, a similar pattern appears across most economies(Figure 5.1). *GDP/H* was negatively affected by the financial crisis; though, recovery was achieved by all economies. The strongest performer in this group is Ireland, and the weakest, by some margin, is the UK. Economies such as Switzerland, Austria and Germany saw some growth of *GDP/H* during the COVID-19 pandemic, though the other countries in Western Europe were negatively impacted, and had failed to recover pre-pandemic rates by 2021.

In Northern Europe, the *GDP/H* of all economies suffered a drop during the financial crisis. However, all recovered and grew in the following years. It appears that *GDP/H* resisted significant negative downturns during the COVID-19 period, and recovery was again achieved, albeit in Finland to a lesser extent (Figure 5.2).

Heterogeneity of the evolution of *GDP/H* was again exhibited in Southern Europe (Figure 5.3). The worst performer, by far, was Greece, which saw *GDP/H* fall dramatically during the financial crisis, with some weak recovery from 2014 to fall again before the pandemic, and fall again in 2020. Spain saw *GDP/H* increase during the financial crisis, and fall modestly during the COVID-19 pandemic, hence could be seen as the best performer in this indicator. Italy and Portugal both experienced the negative consequences of both the financial crisis and the COVID-19 pandemic on *GDP/H*, with modest recovery on both occasions.

In Central and Eastern Europe, *GDP/H* increased overall between 2007 and 2021, with clearer negative impacts by the financial crisis than due to the COVID-19 pandemic (Figure 5.4). Very strong performers included Latvia, Slovakia and Slovenia, while Hungary displayed the weakest performance in this group.

In North America and Oceania, *GDP/H* appeared rather resilient during the financial crisis, with Canada being the only economy in this group clearly negatively affected by the COVID-19 pandemic. All economies in this group saw increases in *GDP/H* across the period, with the US being the top performer (Figure 5.5).

Comparing across the regions, North America and North Europe clearly led performance in *GDP/H*, with Western Europe following closely. Oceania and Central and Eastern Europe both saw overall improvement in *GDP/H*, whilst the poorest performer, South Europe, remained flat between 2007 and 2021 (Figure 5.6).

Figures 5.1-5.6: GDP per hour worked in the countries under study (GDP/H) measured in USD 2015 PPP

Fig 5.1 GDP per hour worked in Western Europe

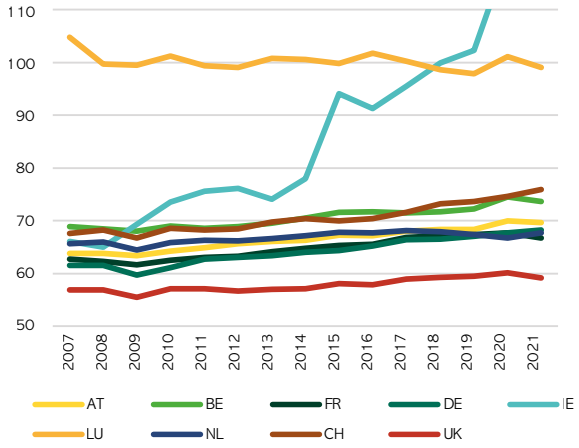


Fig 5.2 GDP per hour worked in Northern Europe

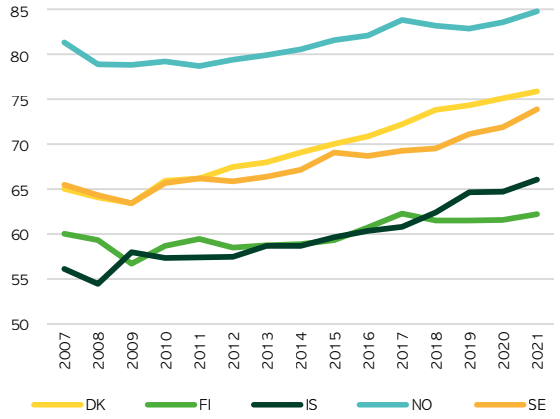


Fig 5.3 GDP per hour worked in Southern Europe

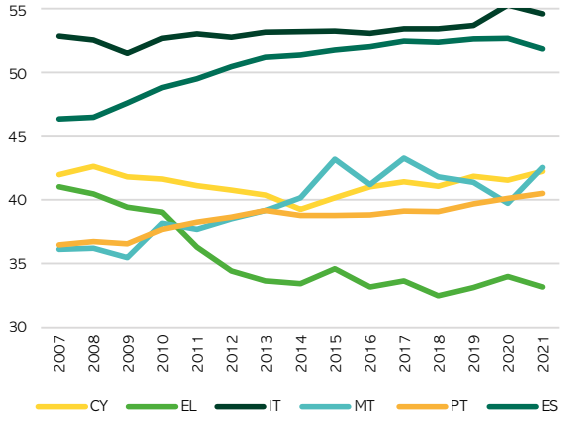


Fig 5.4 GDP per hour worked in Central and Eastern Europe

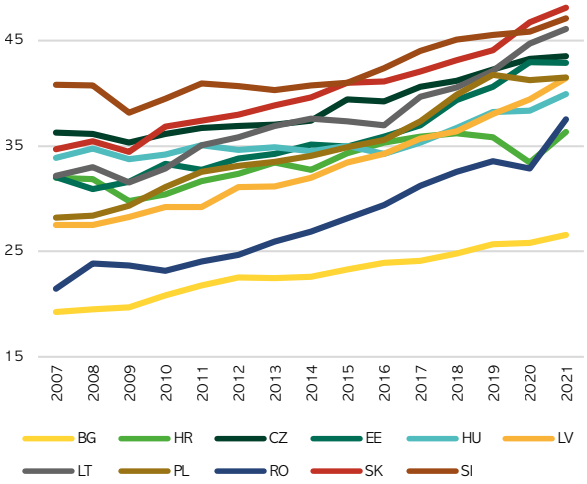


Fig 5.5 GDP per hour worked in Oceania and North America

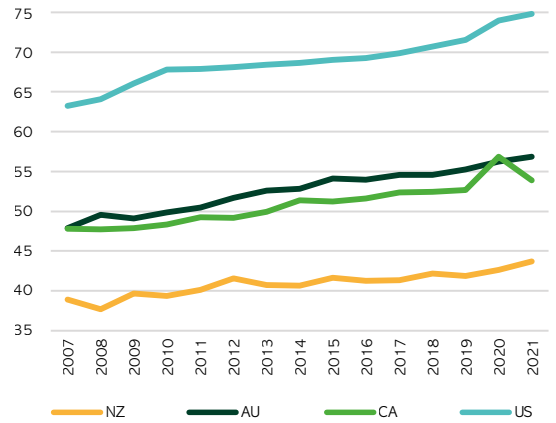
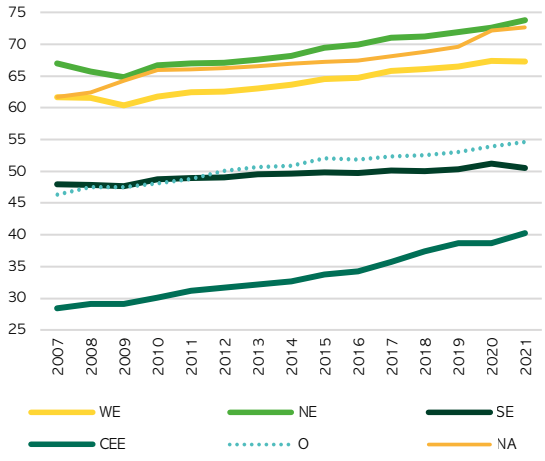


Fig. 5.6 GDP per hour worked by region



Source: Elaborated by authors using OECD (2023) and Eurostat (2023)

As we know, GDP is a measure of economic activity used to capture the value of all goods and services provided, minus the value of the goods and services used in their creation. GDP per worker, or GDP/L, gives an overall impression of the productivity of economies. Workers employed does not distinguish between full-time and part-time employment. Labour productivity per hour worked is calculated as real output per unit of labour input (measured by the total number of hours worked). Measuring labour productivity per hour worked provides a more comprehensive picture of productivity in the economy than labour productivity per person employed, since it eliminates differences in the full-time, part-time composition of the workforce, across countries and years. Moreover, labour productivity is an indicator linked to economic growth, competitiveness, and living standards within an economy. It facilitates assessing GDP-to-labour input levels and growth rates over time, thus providing general information about the efficiency and quality of human capital in the production process for a given economic and social context, including other complementary inputs and innovations used in production.

Sharpe and Mobasher Fard (2022) have summarised research linking productivity and well-being. They conclude that productivity growth has an impact on objective measures of well-being, though this is more pronounced in developing rather than developed economies. However, the link between productivity and a subjective understanding of well-being is more problematic than the link between productivity and objective well-being, in the case of the developed world. In the developed world, the impact of higher incomes on well-being is unclear, as illustrated by the Easterlin Paradox (Easterlin & O'Connor 2022), an example of which is the fact that life satisfaction has barely increased in the US for many decades, despite real income gains. Additionally, strong linkages are identified running from well-being to productivity, especially in the area of health, where policies and programmes aimed at directly or indirectly increasing the well-being of the population will have positive impacts on productivity performance. These productivity gains will, in turn, generate greater income and government revenues that can boost well-being. Productivity growth and improvements in well-being are closely interconnected and can create positive, mutually reinforcing feedback loops.

We now turn to describing *H/L*. Overall, this declined across all economies in the study, and across all regions, between 2007 and 2021 (see Figure 6.6).

In Western Europe, *H/L* fell in nearly all the economies in this group, with declines seen in tandem with the financial crisis and, sharp falls particularly, during the COVID-19 pandemic (see figure 6.1). The United Kingdom exhibited a particularly dramatic fall in *H/L* during the pandemic. The main exception to this overall trend was the Netherlands, where *H/L* seemed to resist the financial crisis, whilst a small negative effect of the COVID-19 pandemic was rapidly overcome.

In contrast, in Northern Europe, though *H/L* also fell during the whole period, this fall was less steep. Again, the COVID-19 pandemic appeared to have a more negative impact on *H/L* than the financial crisis in this region (see Figure 6.2).

In Southern Europe, the COVID-19 pandemic coincided with very sharp declines in *H/L* for all economies in this group. Recovery after the pandemic was only partially attained in 2021, so that 2021 *H/L* levels are all significantly lower than those in 2007 (see Figure 6.3).

In Central and Eastern Europe, *H/L* overall fell across this period (see Figure 6.4). Interestingly, when compared with other European economies, *H/L* in this region was significantly hit by both the financial crisis and by the COVID pandemic. Despite this, there was some heterogeneity within this trend. *H/L* in Poland remained quite resilient in comparison to the other economies in this group, all of which made only partial recoveries by the end of 2021.

In North America and Oceania (see figure 6.5), the US once more performed best in the group; though *H/L* was negatively affected during the financial crisis and to a lesser extent during the pandemic, the value of *H/L* overall rose comparing 2007 to 2021. Canada was the weaker performer of the group, with declines in *H/L* both during the financial and health crisis. With the exception then of the United States, all economies saw moderate declines in this period.

Comparing region by region for *H/L*, North America and North Europe proved the most resilient regions, whilst Western Europe, Central and Eastern Europe and Oceania were negatively affected particularly by the COVID-19 pandemic, making partial recoveries. South Europe was hit particularly hard by the COVID-19 pandemic, seeing very sharp falls in *H/L*, and only a modest recovery by 2021. Southern Europe exhibited the highest *H/L*, the most notable case being Greece, with the lowest decline before the COVID-19 pandemic (see Figure 6.6).

Figures 6.1-6.6: Hours worked per employee in the countries under study, measured by hours per person (H/L).

Fig 6.1 Hours worked per employee in Western Europe

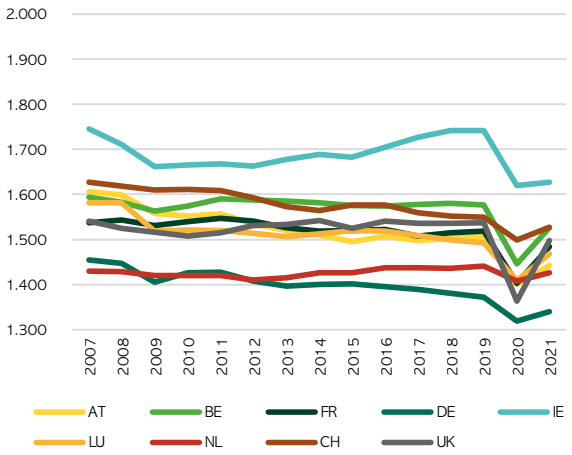


Fig 6.2 Hours worked per employee in Northern Europe

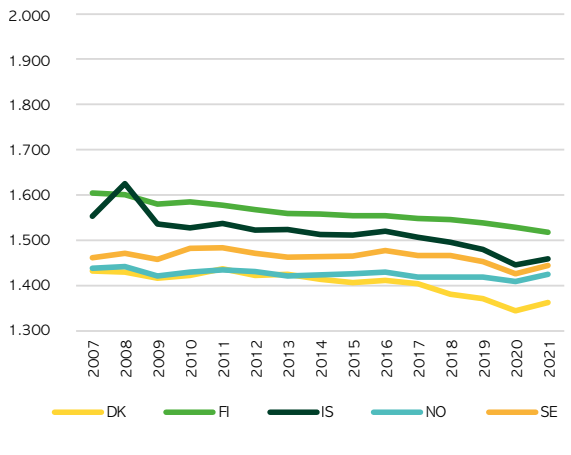


Fig 6.3 Hours worked per employee in Souhern Europe

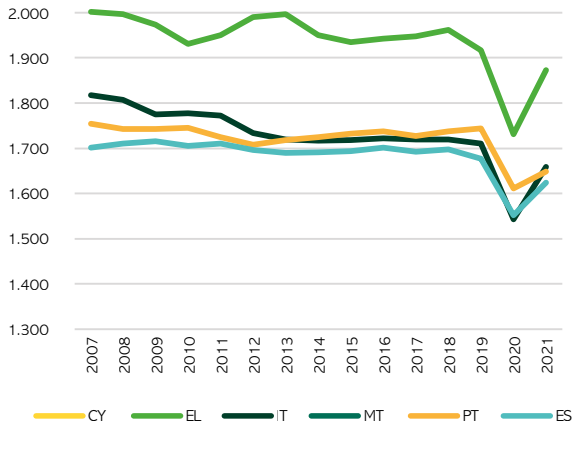


Fig 6.4 Hours worked per employee in Central & Eastern Europe

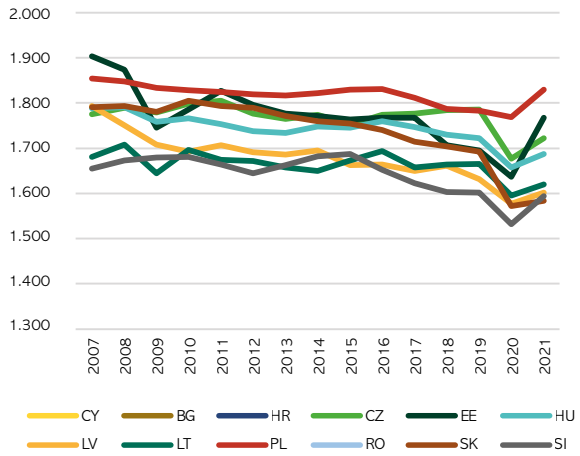


Fig 6.5 Hours worked per employee in North America and Oceania

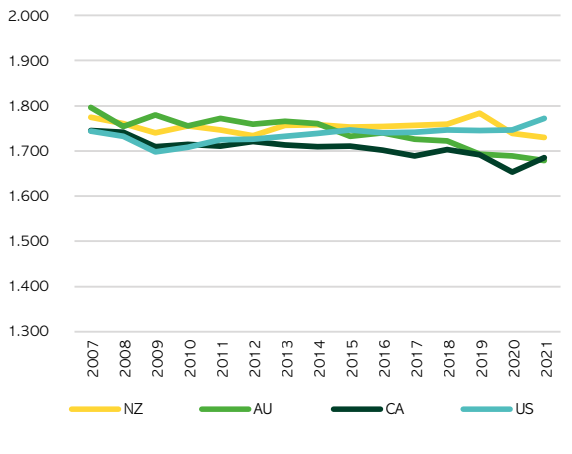
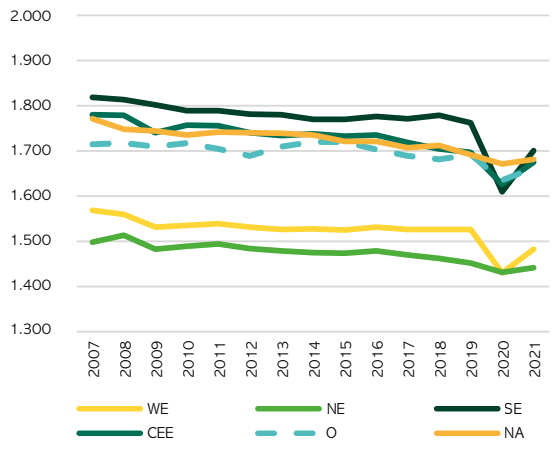


Fig 6.6 Hours worked per employee by regions



Source: Compiled by the authors, based on OECD (2023) and EUROSTAT (2023) for Malta and Cyprus.

3.2.5.1 Output – Outcome

We now examine the correlations between outputs and outcomes, in the following way:

Output = GDP per capita <=> **Outcome** = Productivity per person employed - Productivity per hour worked

GDP / N= (GDP / L) (L / N) = (GDP /H). (H / L). (L / N)
GDP / N= *GDP per capita* ***N*** = *Total population*
GDP / L = *GDP per person employed = Productivity per person employed*
GDP / H= *GDP per hour worked = Productivity per hour worked*
H / L = *Hours worked per person employed*

We first analyse the correlation between our indicator for Economic output (GDP per capita) and Productivity per employee (GDP/L) in the period 2007-2013 (se Figure 7.1). This is performed for 30 countries with reliable data.

In Western Europe, three economies improved their GDP per capita but, at the same time, also experienced a decline in GDP per employee (Austria, Germany and Switzerland), which was exceptional for the whole sample. Two other economies (United Kingdom and Luxembourg) witnessed a fall both in GDP per capita and their productivity per employee. Finally, four countries observed a decline in GDP per capita and an improvement in the productivity per employee.

In Northern Europe, specifically Denmark, Iceland, and Sweden, saw a decline in GDP per capita and an increase in GDP per worker, whilst Finland and Norway saw declines in both GDP per capita and per employee.

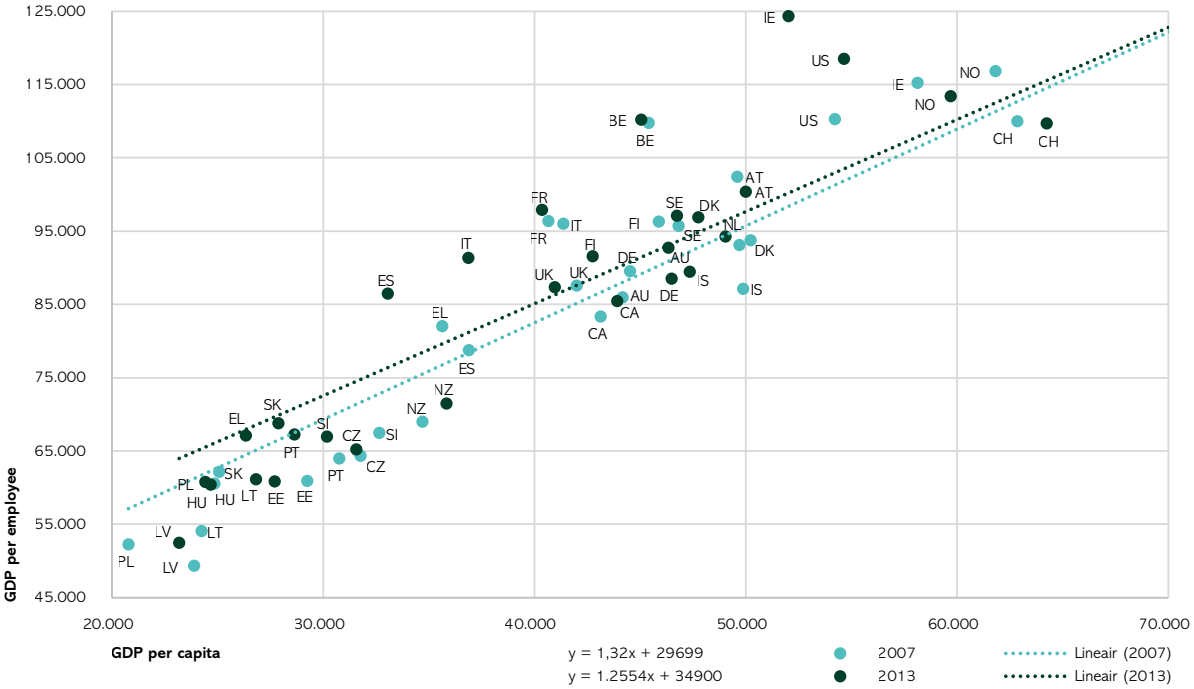
In Southern Europe, two economies (Portugal and Spain) saw declines in GDP per capita and increases in GDP per worker, whilst Greece and Italy saw declines in GDP per capita and per employee.

In Central and Eastern Europe, two economies, Czechia and Latvia, experienced declines in GDP per capita and increases in GDP per employee; Estonia and Hungary saw declines in both GDP per capital and per employee, and Latvia, Poland and Slovakia saw gains in both GDP per capita and employee.

For the Oceania and North America region, economies saw gains in both GDP per capita and employee.

Overall, during the period of financial crisis between 2007-2013, twenty-three out of twenty-six European economies experienced declines, nine European economies experienced falls in GDP per capita and per employee, and eleven saw declines in GDP per capita but increases in GDP per employee (in most cases, with increasing unemployment). Only three economies in Western Europe increased GDP per capita and decreased GDP per employee. Finally, only three European countries saw increases in both GDP per capita and per employee. The four economies of Oceania and North America also saw an increase in both GDP per capita and employee. This can be seen in Figure 7.1.

Figure 7.1: GDP per employee and GDP per capita in 2007 and 2013 (US dollars PPP)

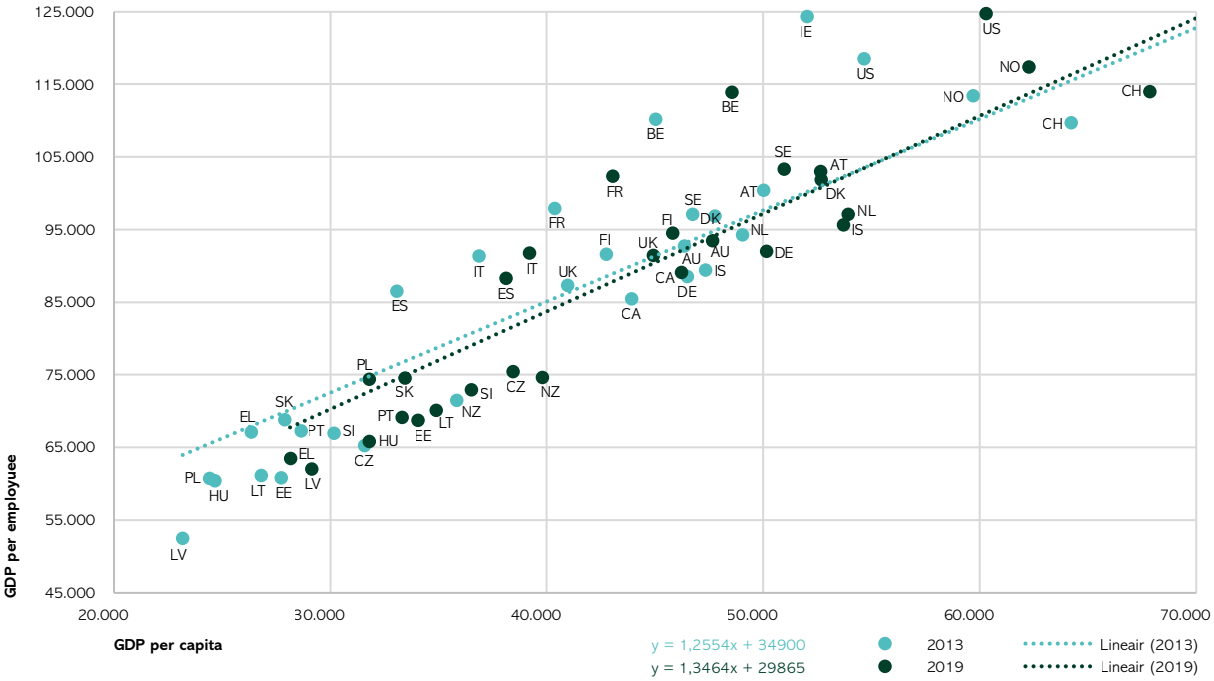


Source: Elaborated by authors based on OECD (2023) and Eurostat (2023)

Next, we analyse the correlation between the indicator for Economic output (GDP per capita) and Productivity per employee (GDP/L) for the period 2013-2019 (see Figure 7.2).

Overall, during the recovery period from 2013 to 2019, all economies improved their GDP per capita and only two experienced declines in GDP per employee (Greece and Luxembourg). This increase in GDP per capita was much higher in the Central and Eastern European economies (around 25% in the whole period) and also for GDP per employee (at 14%) than in the rest of the regions. This is a clear indicator of their convergence as regards GDP and income per capita and GDP per employee to the EU and OECD average levels.

Figure 7.2: GDP per employee and GDP per capita in 2013 and 2019 (US dollars PPP)



Source: Elaborated by authors based on OECD (2023) and Eurostat (2023)

Figures 7.1 and 7.2 are also indicative of the difference between the GDP or income per inhabitant in each economy in terms of the productivity or GDP per employee. The estimated lineal trends in 2007, 2013 and 2019, are relatively consistent/stable. Despite the financial crisis, we can observe a general trend where certain economies in the Western European region, such as Belgium, France, and Luxembourg, enjoyed a higher GDP per employee than expected in terms of their GDP per capita. In contrast, Austria, Germany and the Netherlands and Switzerland showed the opposite result. In general, all the Central and Eastern European economies showed also a similar result than Austria, Germany and the Netherlands and Switzerland which was a low GDP per employee in relation to their GDP per capita. Another result that could be extracted from the estimated lineal regressions in 2007, 2013 and 2019 is that the Central and Eastern European economies showed a much faster convergence in their GDP per capita than in GDP per employee, in particular, during the recovery phase 2013-2019.

3.2.6. Satisfaction and trust

In order to capture some indicators to express satisfaction and trust by citizens as regards the Economy at a general level, we include indicators on regulatory quality, control of corruption, competitiveness and happiness.

Regulatory Quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. World Bank - World Wide Governance Indicators (2023) - Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.

Control of Corruption is an index elaborated by the World Bank as one of the six composite World Governance Indicators to capture corruption on a scale of -2.5 to +2.5, where the higher the index the less the corruption indicated.

The Global Competitiveness Index (GCI) was a highly comprehensive index published by the World Economy Forum until 2019, which captured the microeconomic and macroeconomic foundations of national competitiveness. Competitiveness as the set of institutions, policies, and factors that determine the level of productivity of a country. The Global Competitiveness Report: various issues.

Happiness as a Subjective well-being scores are published annually since 2012 in the World Happiness Report (2023).[2] The happiness scores are based on perceptions to the main life evaluation question asked in the poll. This question, known as the Cantril ladder, asks to think of a ladder with the best possible life for them being a 10 and the worst possible life being a 0 and to rate their own current lives on that scale. Other variables are considered to estimate the extent to which each of six factors – economic production, social support, life expectancy, freedom, absence of corruption, and generosity – contribute to making life evaluations higher in each country than they are in Dystopia, a hypothetical country that has values equal to the world's lowest national averages for each of the six factors. These variables have no impact on the total score reported for each country, but these factors try to explain why some countries rank higher than others.

The Eurostat also elaborates Personal Well-being statistics and ratings of life satisfaction based on three indicators: job satisfaction, financial situation and personal relationships, but the data is restricted to European countries for the years 2013, 2018, 2021 and 2022 (Eurostat 2023)

3.2.6.1. Regulatory quality and Control of corruption

Regulatory quality in Western Europe fluctuated but only mildly, between 2007 and 2021, and always within the band between +1 and +2, demonstrating a good overall performance. Within this group of countries, the lowest performers were France and Belgium, which observed some decline during this period, and recovered to the 2007 levels by the end of the period. The best performer was the UK, which saw an increase in regulatory quality until 2017, followed by a decline towards the average result of this group (Figure 8.1).

Northern Europe - Denmark, Finland, Sweden and Iceland - followed similar patterns to the rest of Western Europe, with regulatory quality between +1 and +2. Iceland, like France and Belgium, was the worst performer in this sub-group, and experienced a fall during the period, but had recovered to 2007 levels by 2021 (Figure 8.2).
In Southern Europe, regulatory quality was lower on average than in Western Europe, this time within the 0 and +1.5 band. Regulatory quality fell for all members in this group, and had not recovered to 2007 levels by 2021. There were no best performers in this case, but the worst performer was Greece, falling to 0 in 2016, and only partially recovering by 2021 (Figure 8.3).

In Central and Eastern Europe, regulatory quality largely fell in a similar band to that of Southern Europe, 0 to +1.5, with the exception of Bulgaria, the best performer, which overall saw increased values, ending on +1.6 by 2021. In contrast with Southern Europe, many countries in this group saw fluctuation but overall increases in this period, including Czech Republic, Lithuania, and Latvia. The worst performer in this group was Romania, which started in a low position and declined, to 0.3, by 2021 (Figure 8.4).

Regulatory quality in Oceania and North America largely remained within the +1.2 to +2 band, representing therefore the highest overall performer by region. New Zealand was the best performer, increasing from +1.7 to over +2 in 2017, ending on +1.8 by 2021. Australia and Canada were relatively stable, whilst the US was the weakest performer in this group. In the US, regulatory quality was the lowest of the group throughout the period, starting at +1.5, falling to +1.2 in 2015, and only partially recovering to +1.4 in 2021 (Figure 8.5).

[2] The World Happiness Report (2023) is published by Sustainable Development Solutions Network, the preparation of the report is at the Center for Sustainable Development at Columbia University, with research support from the Centre for Economic Performance at the London School of Economics; the Vancouver School of Economics at the University of British Columbia; the Wellbeing Research Centre at the University of Oxford; and the Helping and Happiness Lab at Simon Fraser University

Figures 8.1.1 to 8.1.6: Regulatory quality in the countries under study.
Measured on a scale from 2-5 (strong) to – 2.5 (weak).

Fig. 8.1.1 Regulatory Quality in Western Europe

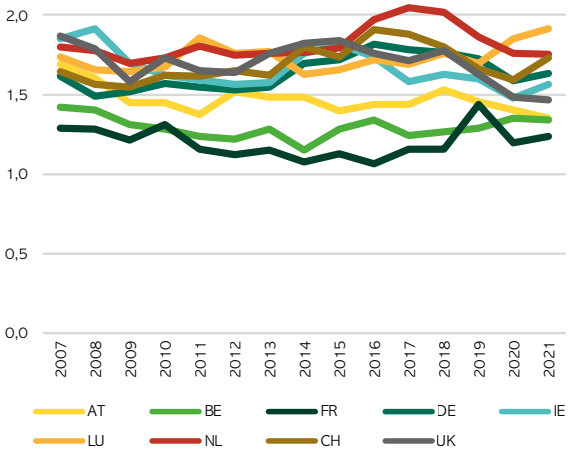


Fig. 8.1.2 Regulatory Quality in Northern Europe

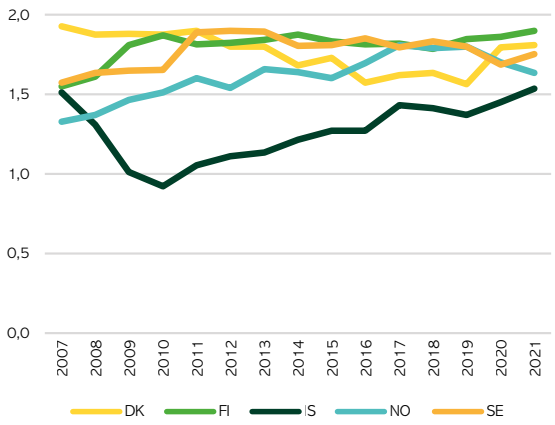


Fig. 8.1.3 Regulatory Quality in Souhern Europe

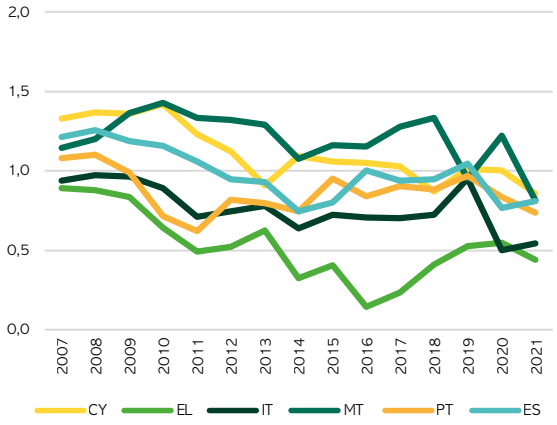


Fig. 8.1.4 Regulatory Quality in Central & Eastern Europe

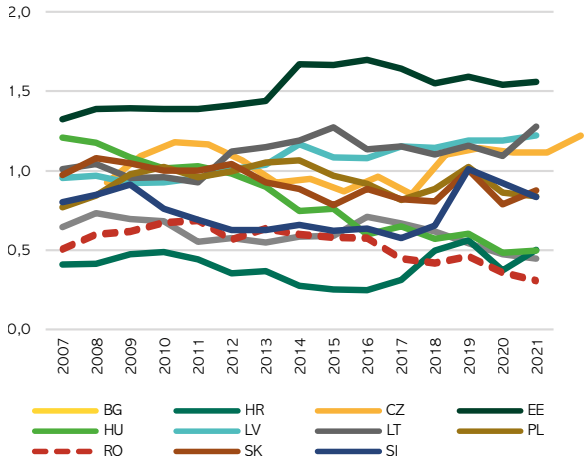


Fig. 8.1.5 Regulatory Quality in Oceania and North America

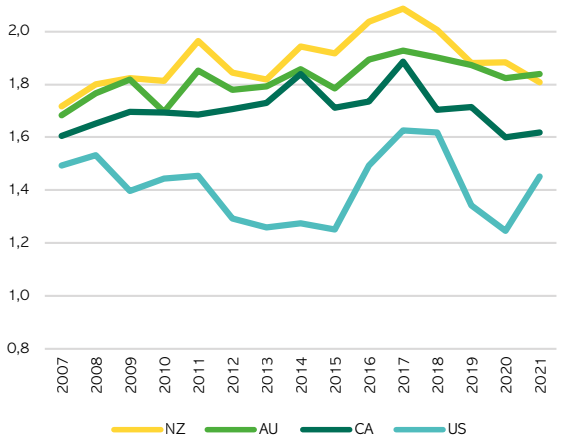
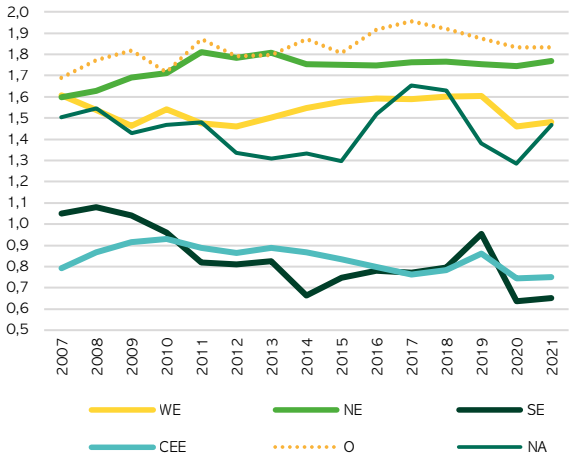


Fig 8.1.6 Regulatory Quality by region



Source: Elaborated by authors based on World Bank (2023)

Control of corruption was relatively high and stable in Western Europe across the period under study (Figure 8.2.1). Stronger performers in this group included Luxembourg, Switzerland, and the Netherlands, with weaker performances by France, which saw a decline from a moderate result from 2011 onwards.

Northern Europe was a strong performer overall, as a country group, maintaining a minimum of around +1.8 points throughout most of the period. Denmark was the strongest performer inside this group, with Iceland being the weakest (Figure 8.2.2).

Control of corruption in Southern Europe was, as a group, weaker than both Western and Northern Europe. The majority of countries in this group started with a result of around +1 point at the beginning of the period, all seeing different degrees of decline throughout, until 2021. The lowest results were found in Greece, whose result fell across the whole period, with some weak recovery from 2016 (Figure 8.2.3). Italy was the second weakest performer, after Greece.

In Central and Eastern Europe (Figure 8.2.4), control of corruption was quite weak and relatively similar to that in Southern Europe (Figure 8.2.4). Maximum results were obtained by Estonia, in this group, with gradual improvements throughout the period. Minimum results were seen in Croatia.

For the final group, control of corruption was quite strong, though slightly more volatile than in the cases of Western and Northern Europe (Figure 8.2.5). The US was the weakest performer in this group, falling from the beginning of the period until 2015, and recovering the initial values by the end of the period. New Zealand was the strongest performer, whilst Canada and Australia performed well in second place.

Figures 8.2.1-8.2.6: Control of corruption in the countries under study, 2.5 being strong and -2.5 weak.

Fig. 8.2.1 Control of Corruption in Western Europe

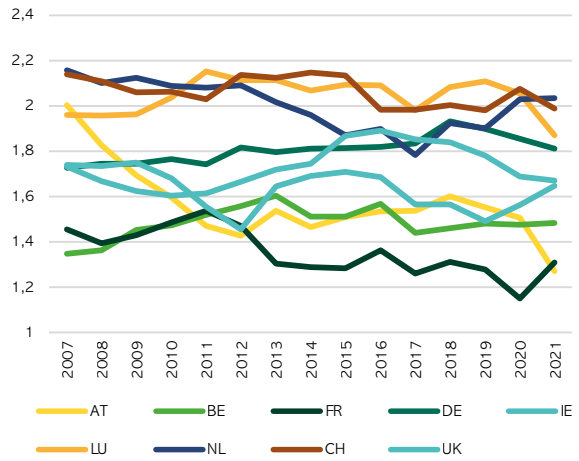


Fig. 8.2.2 Control of Corruption in Northern Europe

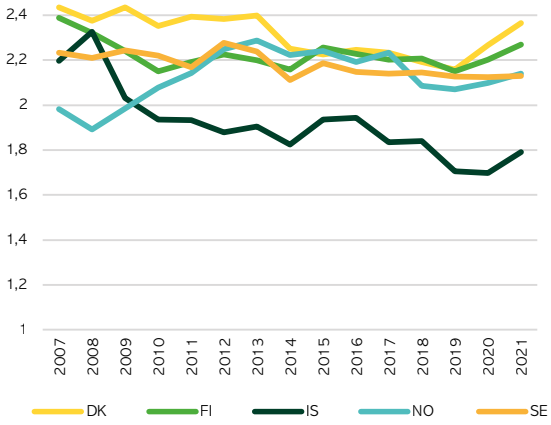


Fig. 8.2.3 Control of Corruption in Southern Europe

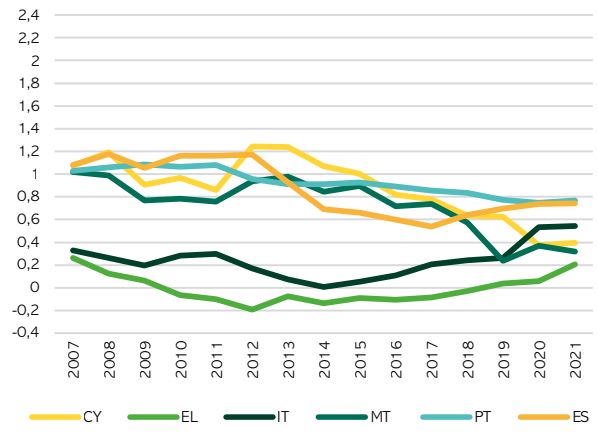


Fig. 8.2.4 Control of Corruption in Central and Europe

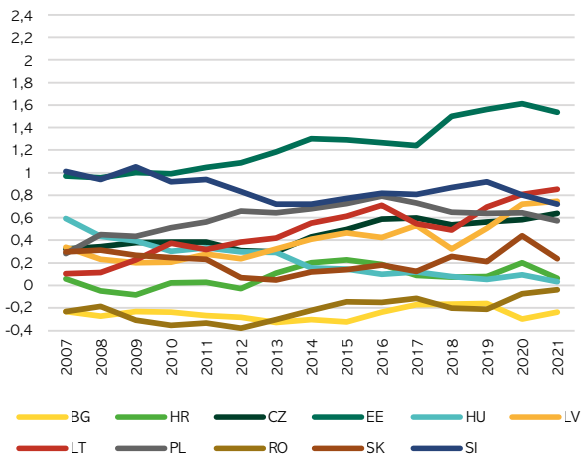


Fig. 8.2.5 Control of Corruption in Oceania and Northern America

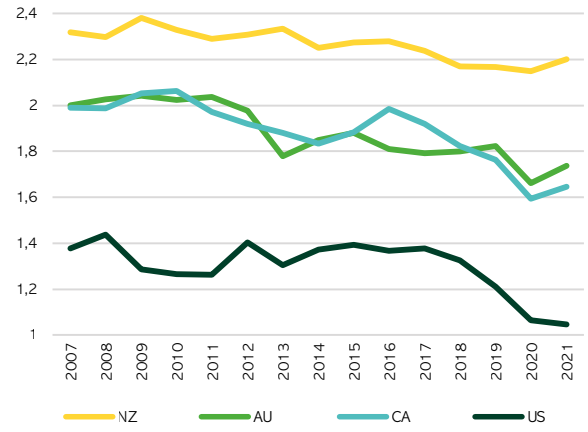
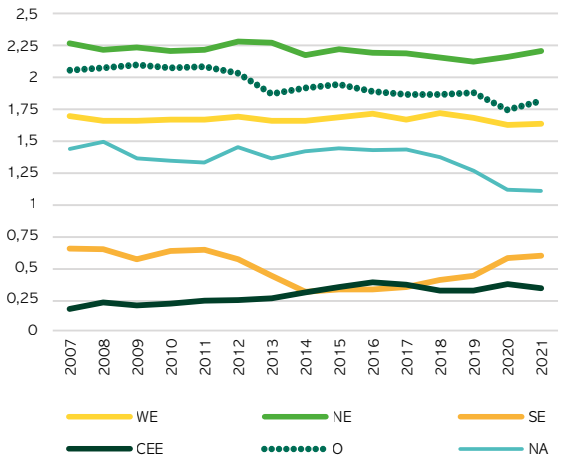


Fig 8.2.6 Control of Corruption by regions



Source: Elaborated by authors based on World Bank (2023)

As regards global competitiveness, country results are expressed as a value with the maximum of 100 points. Figures 8.3.1-6 show the results obtained. In Western Europe, results for global competitiveness were strong, 68 being a minimum result for the group, and a maximum at around 84 (Switzerland). Results were stable across the period (Figure 8.3.1).

Similarly, in Northern Europe (Figure 8.3.2), global competitiveness results were strong and stable, minimum results being around 67 and maximum just over 80 points.

Southern Europe (Figure 8.3.3) and Central and Eastern Europe (Figure 8.3.4) were the two lowest group performers regions. In Southern European countries, there was diversity in the results: the lowest result was Greece, at 55 and the maximum result was Spain (68). In Central and Eastern Europe, results were also quite stable, Estonia being the strongest performer in the group.

In Oceania and North America, (Figure 8.3.5), the strongest performer was the US, with a low of 78 points and a high of nearly 85 points. Canada, New Zealand and Australia performed well and similarly, but not as strongly as the US.

Comparing groups, as can be seen in Figure 8.3.6, the strongest performers were US (as North America), Western and Northern Europe, as well as Oceania, with the other regions significantly lower.

Figures 8.3.1-8.3.6: Global Competitiveness Index in the countries and regions under study, Index min=0 and max =100

Fig 8.3.1 Global Competitiveness Index in Western Europe (max=100)

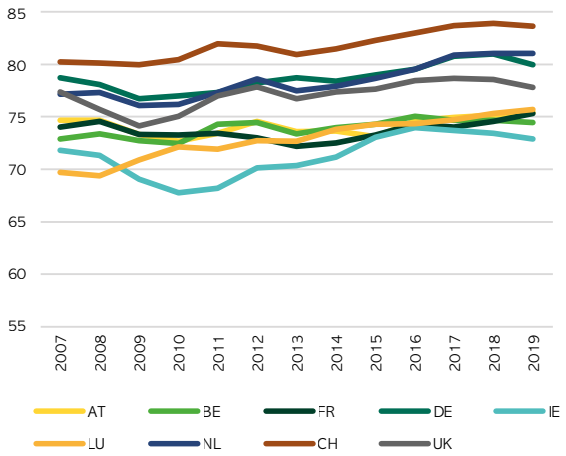


Fig. 8.3.2 Global Competitiveness Index in Northern Europe (max=100)

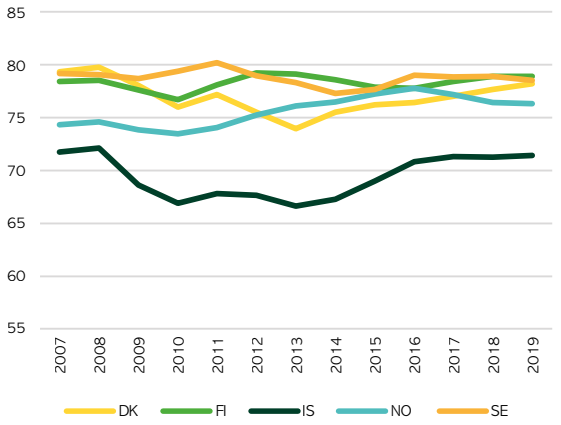


Fig. 8.3.3 Global Competitiveness Index in Southern Europe (max=100)

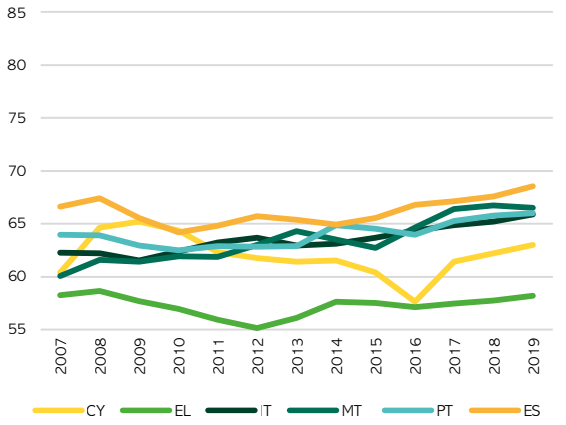


Fig. 8.3.4 Global Competitiveness Index in Central and Eastern Europe (max=100)

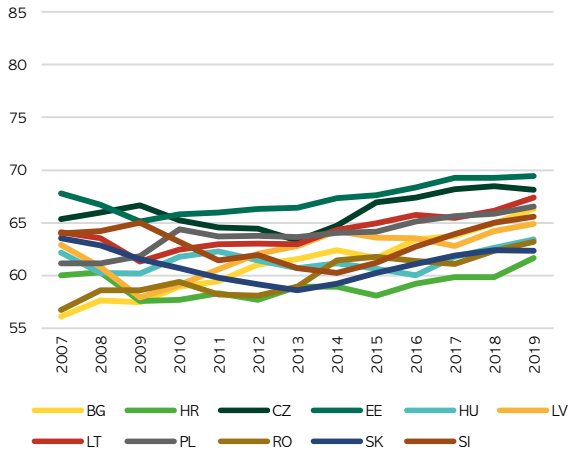


Fig. 8.3.5 Global Competitiveness Index in Oceania and North America (max=100)

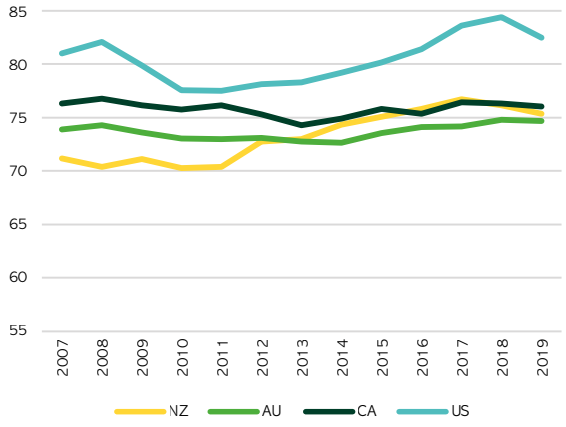
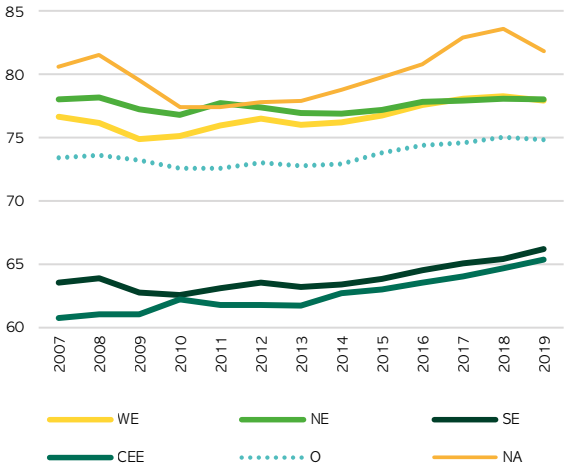


Fig. 8.3.6 Global Competitiveness Index by regions (max=100)



Source: Elaborated by authors based on World Economic Forum (2020) Global Competitivenss Report

Figures 8.4.1-8.4.6: Global Happiness score

Fig. 8.4.1 Happiness score in Western Europe (0-10)

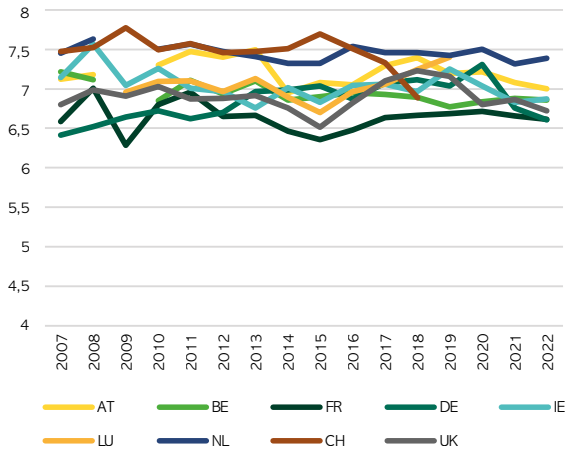


Fig. 8.4.2 Happiness score in Northern Europe (0-10)

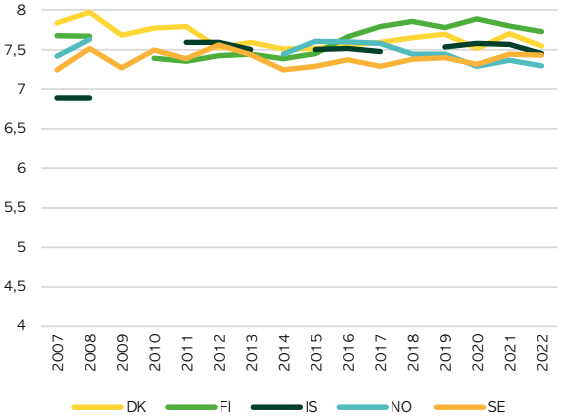


Fig. 8.4.3 Happiness score in Southern Europe (0-10)

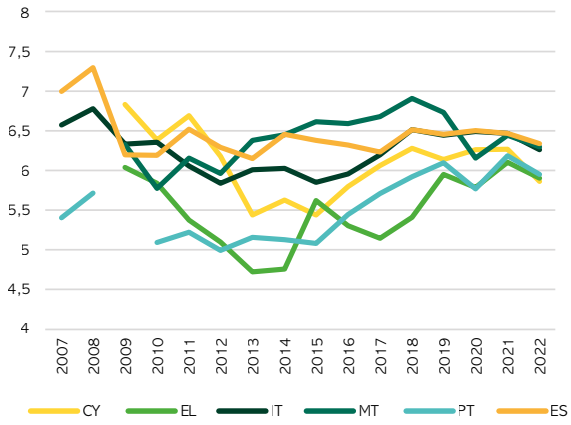


Fig. 8.4.4 Happiness score in Central and Eastern Europe (0-10)

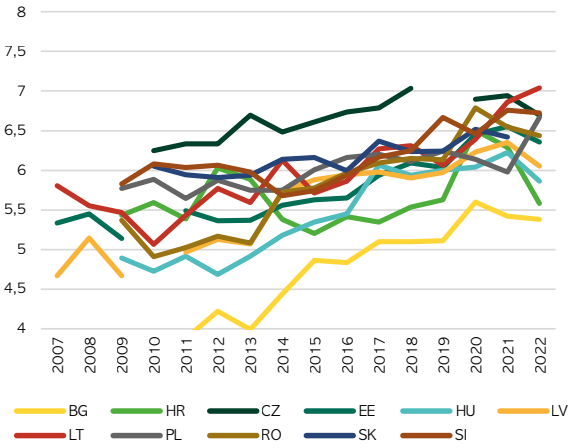


Fig. 8.4.5 Happiness score in Oeeania Northern America (0-10)

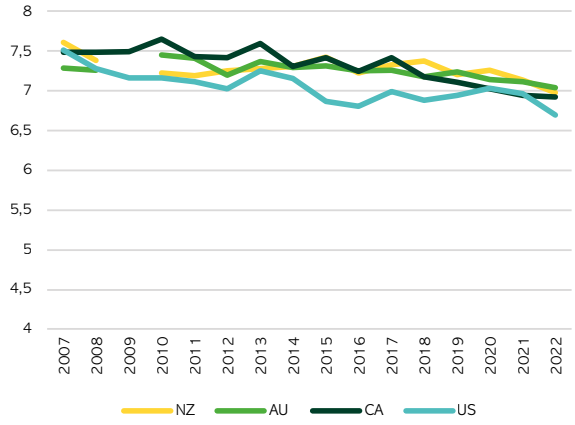
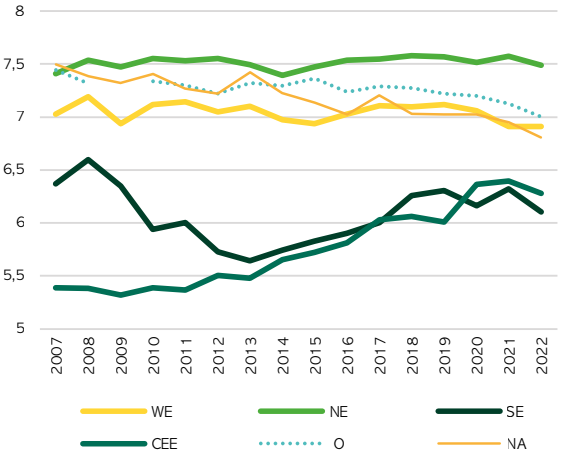
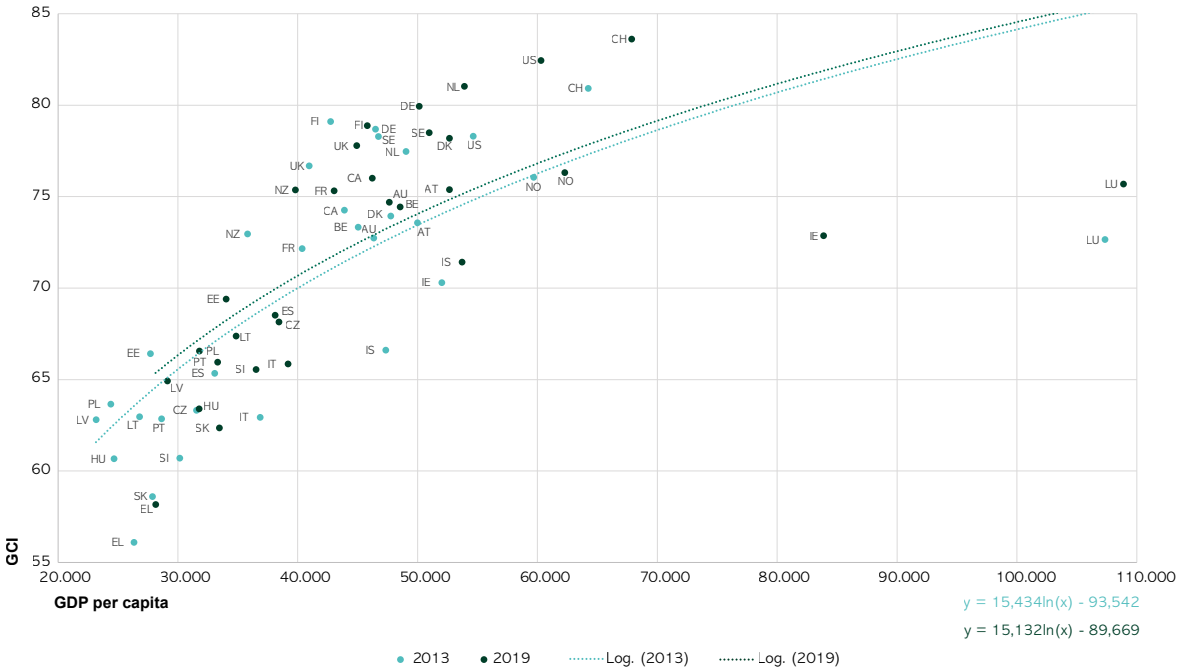


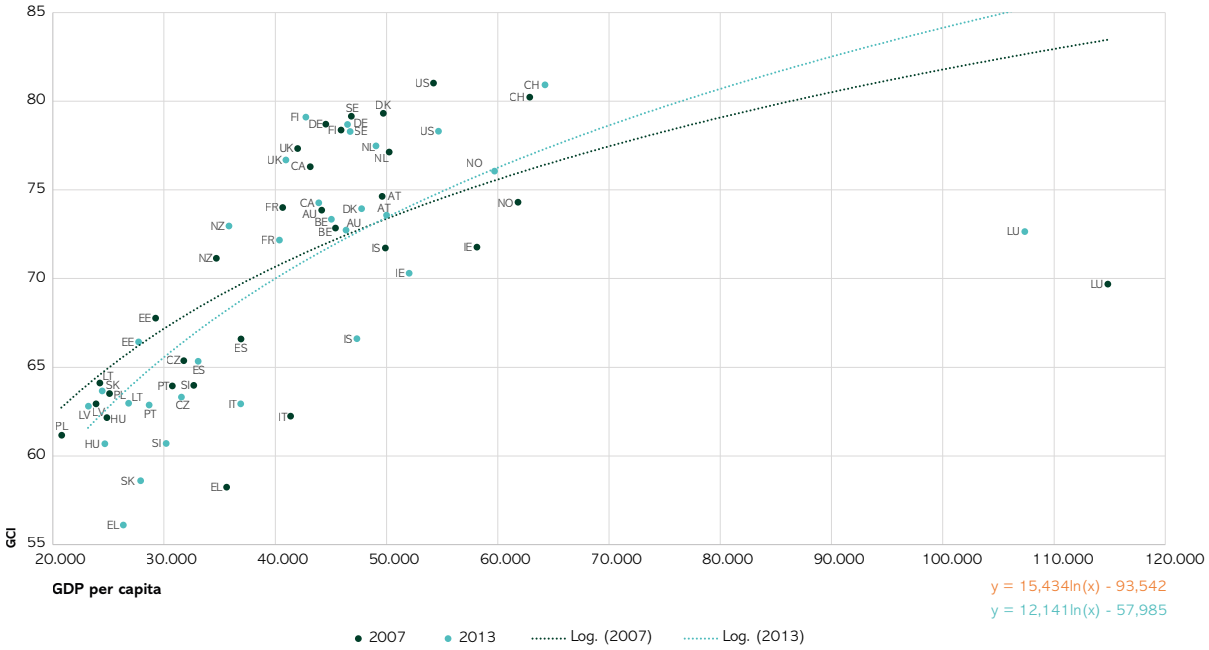
Fig. 8.4.6 Happiness score by region (0-10)



Source: based on information from World Happiness Report (2023)

Figures 9.1-9.2: Competitiveness and GDP per capita, first, between 2007 and 2013, then between 2013 and 2019:





As regards happiness, results for the countries under study can be seen in Figures 8.4.1-6.

In Western Europe, scores for happiness were quite high and also stable across the period (Figure 8.4.1), with Switzerland leading and France exhibiting the lowest results. In Northern Europe, results were also highly stable and strong, with only small differences between this high performing group of countries (Figure 8.4.2).

Southern Europe, in contrast, exhibited volatility and diversity, with happiness scores generally falling during the period, and a partial recovery at the end (Figure 8.4.3). Greece was the lowest performer in this case, with Spain and Malta being the highest performers. The highest result in this group, Spain in 2008, just before the financial crisis, was still lower than the lowest values in Northern Europe.

In Central and Eastern Europe, as seen in Figure 8.4.5, happiness actually increased over the period. There was diversity in this group, with higher performers including the Czech Republic and Bulgaria being the lowest.

Happiness in Oceania and North Americas was remarkably stable and similar across the period (Figure 8.4.5), with evidence of a very minor decline.

Comparing countries by regions, Northern Europeans showed highest results for happiness, followed by Oceania and North America, and Western Europe. Central and Eastern Europe was much lower but on the increase, whilst in Southern Europe, happiness had declined from a higher level than Central and Eastern Europe, and only partially recovered (Figure 8.4.6).

3.3. INFRASTRUCTURE AND TRANSPORT

The dynamics of investment can be examined following a classification based on main assets. For the purpose of this chapter, there are four major categories of investment by assets that are key and very significant for economic activity. Two of these are related to Infrastructure and Transport equipment, which are examined in this section, and the other two categories of investment are related to Information and Communication Technologies (ICT) and Intellectual Property Rights (IPR). These will be examined in the following section, on Science, Technology and Innovation. Each asset category is measured as a percentage of total GDP. For this chapter, Investment (GFCF) by asset type will be extracted from OECD (2023).[3] These four categories combined in the cases of the countries included in this study between 2007 and 2021 made up for around 70% of total GFCF. Hence, they are significant and very relevant indicators of economic and social activity.

To break down the categories further, the two categories of investment examined in this section include:

1. Operative buildings and infrastructures (including roads, bridges, airfields and dams). The standard definition used by OECD (2023) is "Other Buildings and Structure". On average, this category is the largest, single component of GFCF, constituting some 30.7% for the period 2017-2021. The countries with the highest fractions of this category on total GFCF were Norway (43.8%), Lithuania (43.5%), Latvia (42.6%) and Poland (40.5%), whilst the lowest ones were Switzerland (17%), Ireland (18.9%) and Germany (19.9%).

2. Transport equipment (including ships, trains, aircraft). Transport equipment is an important category of investment, again, clearly related to economic activity. On average, transport equipment assets on total GFCA accounted for some 9% between 2007 and 2021. There were significant differences among countries, with the highest shares in Luxembourg (21%) and Ireland (18.1%) and the lowest in Canada (4%), Finland (4.4%) and the United Kingdom (5.7%).

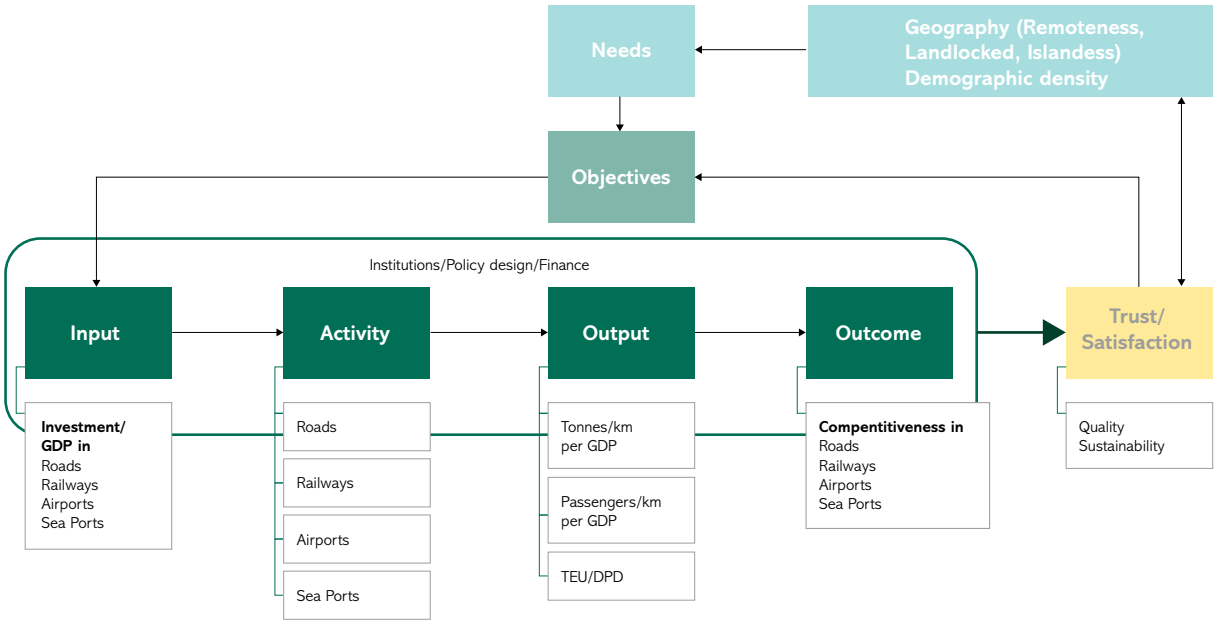
It is also worth mentioning that there is an Investment category associated with Buildings and Construction. This category is not relevant for this chapter and section. However, it is of relevance for another chapter of this study, on Housing Policy. The category referred to as "Dwellings" (excluding land), is mainly household residence investment, which, in the national account systems, are not considered as an economic input related to economic output (GDP). These assets for all the countries considered in this chapter made up for around 20% of total GFCF in the period

[3] OECD (2023) Doi: 10.1787/8e5d47e6-en (accessed on 16 February 2023).

2007-2021, with a maximum of 23% in 2007 and a minimum of 18.6% in 2014 and 2015, followed by a gradual recovery to 21.6% in 2019. The countries with a higher fraction of Investment in Dwelling were Canada (31.5%), Germany, Finland, Spain, New Zealand and France (all around 28.5%). The countries with the lowest fraction were Latvia, Ireland, Hungary, Lithuania and Poland (from 11.5% to 13.7%). This is mentioned to highlight that the contribution on total economic productive investment (GFCF, excluding Dwellings) of the four examined categories of "Building and infrastructure", "Transport Equipment", "ICT" and "IPR" is higher than that on total Investment (87% of GFCF, excluding Dwellings) (EUROSTAT 2023).

3.3.1. Input

Diagram 2: The Conceptual framework for Infrastructure and Transport



Following the conceptual framework deployed by EIPA (2023), which was already adapted in the previous section for the Economy, in this section we tailored the framework for the Infrastructure and Transport (Diagram 2). Firstly, we examine investment in infrastructure which covers spending on new transport construction and the improvement of the existing network, and, secondly, we include investment in transport equipment. In the following sections we will extend the analysis of transport investment following the same steps as in the Economy section, considering input, output and competitiveness-outcome by activities. Finally, we consider indicators of satisfaction relevant to Transport.

This section is divided into Investment in Buildings and Structures, and Investment in Transport Equipment. Investment in Buildings and Structures in Western Europe exhibited some fluctuations during the period between 2007 to 2021, always within the band of minimum 3% and a maximum of 9%. However, most countries tended to recover and even surpass 2007 levels by the end of the period. To a great extent, Luxembourg was the star performer, with investment in this asset reaching 8.6% by 2011, but then declined, being overtaken by Austria in 2018, which ended with the highest level of this group, at 7.2% by 2021. Ireland saw a dramatic fall in this category of investment, from a high of 7.3% in 2007, to the lowest result of the whole group, just 3.9% in 2021. Other countries, such as Switzerland, Belgium, France and Germany remained quite stable during this timeframe (Figure 10.1).

In Northern Europe, the band was higher than the one of Western Europe, with a minimum of 4%, and a maximum of over 12% (Figure 10.2). Iceland started with a very high level, over 12%, but dived from 2007 to 2012, recovering in 2018, only to fall again, to around 6.5% in 2021. Norway was the highest, steady performer in the group, with a lowest level of 9% and highest at 12%. Denmark, Sweden and Finland were the most stable countries in this category during the whole period.

Investment in this category in Southern Europe generally fell throughout the period in all countries. In 2007, the band of investment ranged from 4% to 9.5%; by 2021, this was 3.5% to 7.5%. Portugal, Spain and Greece saw significant drops, whilst Italy, Malta and Cyprus made some recovery by 2021 (Figure 10.3).

In Central and Eastern Europe, investment in this asset category also saw sharp declines for all the countries, without exception. In 2007, the band of investment ranged from 7% to over 15%, though by 2021 it had dropped to a range between 4% and 13% (Figure 10.4). Romania was the strongest performer, starting at levels over 15%, and though this fell sharply, the country had recovered to the leading position, at 12.7% by 2021. The worst performer in this group was Bulgaria, which started at around 7.5% but declined to 3.9% by the end of the period.

In Oceania and North America, investment in this category also witnessed declines for all countries in this group. In 2007, the band of investment ranged from around a 5.5% low to a 9.5% high. By 2021, these levels were just over 4% and 8%. Australia was the country to exhibit a larger percentage of investment in this category, though the decline was considerable, from 9.5% to 8%. The US was the worst performer in this category, with its investment falling overall from around 5.5% to 4% (Figure 10.5).

Therefore, by region, Australia was a star performer, though it saw significant decline in this period. Western and North Europe, plus North America, remained stable throughout, with intermediate investment levels. Central and Eastern Europe, and Southern Europe both exhibited significant declines in the period, only with partial recoveries by 2021 (Figure 10.6).

Figures 10.1-10.6: Investment in Buildings and Structures in the countries under study (as a percentage of GDP)

Fig. 10.1 Investment in Building and structures in Western Europe (% GDP)

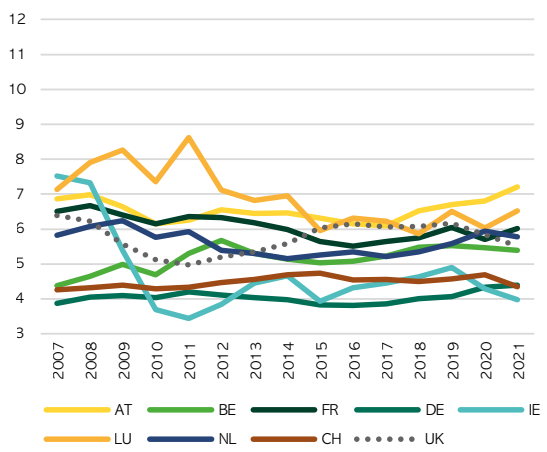


Fig. 10.2 Investment in Building and structures in Northern Europe (% GDP)

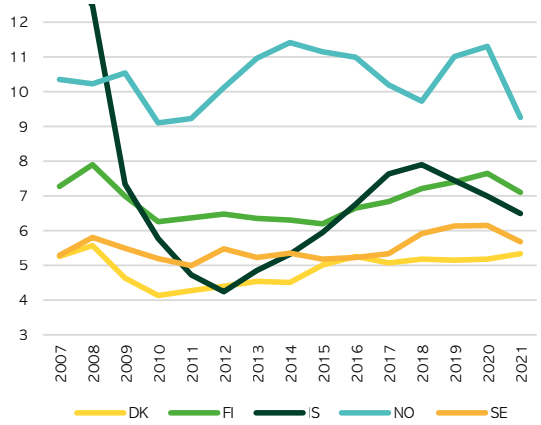


Fig. 10.3 Investment in Building and structures in Southern Europe (% GDP)

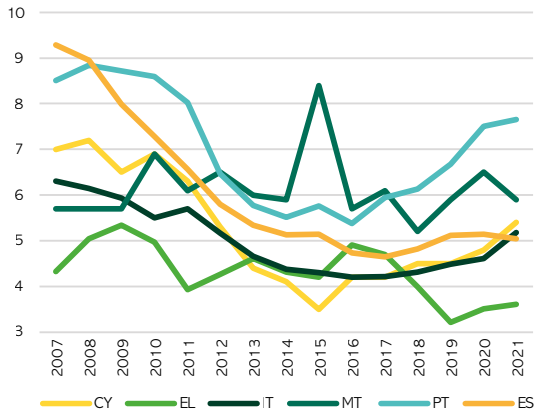


Fig.10.4 Investment in Building and structures in Central and Eastern Europe (% GPD)

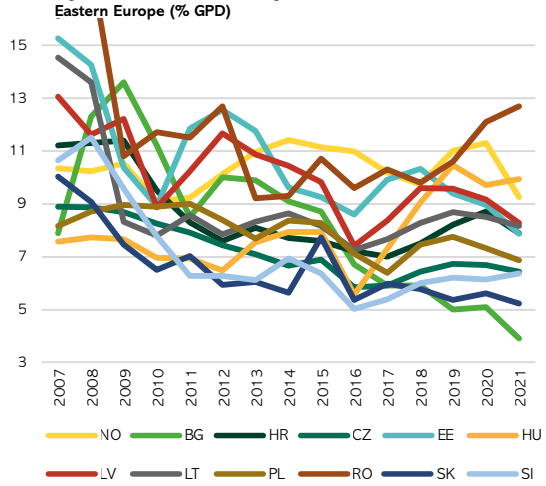


Fig. 10.5 Investment in Building & structures in Oceania and North America (% GDP)

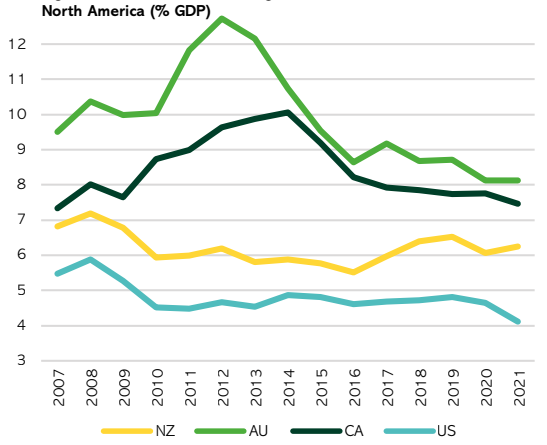
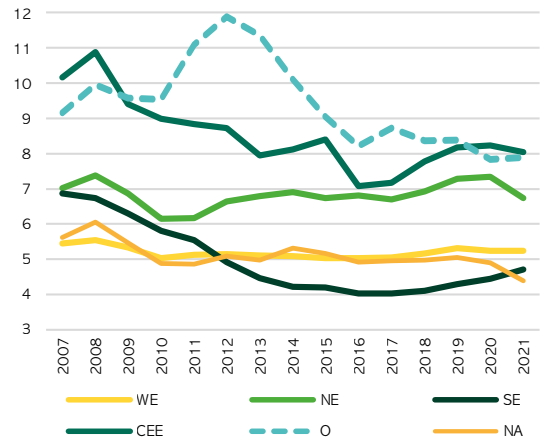


Fig 10.6 Investment in Buildings and structures by regions (% GDP)



Sources: Elaborated by authors based on OECD (2023) and EUROSTAT (2023)

Regarding investment in transport equipment, in Western Europe, countries in this group could be divided into two sub-groups (Figure 11.1). In the first sub-group is Ireland and Luxembourg. Both countries started the period in 2007 with the highest ratios in this group, around 4%, and grew, unevenly, until 2012, after which Luxembourg continuously fell, reaching around 3.13% in 2021, whilst Ireland continued to grow, until 2018, after which it also fell sharply, to similar levels as Luxembourg. The other sub-group exhibited much more stability, with ratios between 1% and 2.5% in 2007 and 2021. Generally speaking, though there were slight falls and declines, most countries in this sub-group saw little change overall during the period.

In Northern Europe, investment ratios were generally speaking similar to the second sub-group in Western Europe, ranging between 1% and 2.5% throughout (Figure 11.2). The exception was Iceland, which plummeted to a negative ratio in 2009, and then reached a high of 3.75% in 2016. However, it then saw declines to around 2.4% in 2021, which still represented a vast improvement on its levels in 2007. The other members of this group, similar to the second sub-group in Western Europe, were quite stable, though with fluctuations, so that results by 2021 were not significantly higher or lower than 2007 levels.

In Southern Europe, Greece saw its investment levels drop dramatically, from over 5% in 2007 to 0.42% by 2011, after which some incremental improvement occurred to reach about 1% in 2021. Spain, Italy and Portugal all saw declines in this category, with only partial recovery compared to 2007 levels by 2021 (Figure 11.3).

In Central and Eastern Europe, most countries' investment levels fluctuated within the 1.5% low and 4% high band in 2007, and overall, fell slightly, to within a 1% low and 3% high band by 2021 (Figure 11.4). At the beginning of the period, there were three high performers: Romania, Latvia, and Estonia, all of which started out with relatively high levels, between 5% and 6%. However, all of these countries also plummeted by 2 or 3 percentage points in the next two years. From then onwards, these three countries remained within the same band as their fellow countries in this group. By 2021, the best performers were Hungary and Romania, at the top of the 3% band.

In Oceania and North America, investment in transport fell overall in the period, from a band of a 1% low to a 2.5% high in 2007 to a 0.72% low and 1.68% high in 2021. Overall, New Zealand performed slightly better than the other countries in this group, still it did not manage to recover to 2007 levels by 2021, ending with a ratio of 1.68%. The worst performer was Canada, starting in 2007 with a ratio of just over 1%, and ending with a low of 0.72% (Figure 11.5).

By region, Central and Eastern Europe started out as the best performers, a result biased by the sub-set of countries mentioned above, however, within a couple of years, these results fell dramatically. Despite this, by the end of the period, this group of countries exhibited the highest ratio of investment for this category, at 2%. Western and Northern Europe as well as North America experienced falls and declines and were unable to fully recover up to 2007 levels by 2021. This trend was even more dramatic for Southern Europe, which experienced overall declines from 2.15% in 2007 to 1.25% in 2021, and Oceania, falling from 2.5% to 1.5% in the same period (Figure 11.6).

Figures 11.1-11.6: Investment in Transport Equipment in the countries under study (as a percentage of GDP)

Fig. 11.1 Investment in Transport equipment in Western Europe (% GDP)

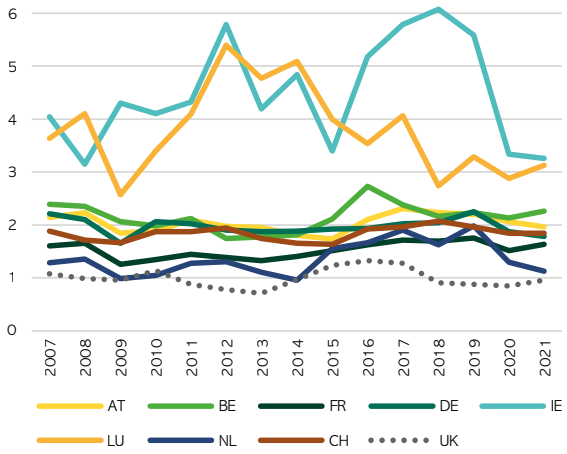


Fig. 11.2 Investment in Transport equipment in Northern Europe (% GDP)

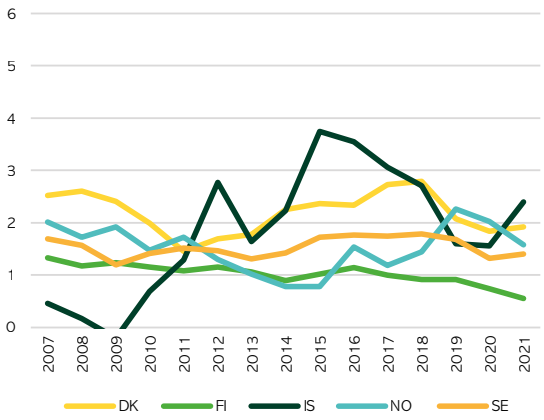


Fig. 11.3 Investment in Transport equipment in Souther Europe (% GDP)

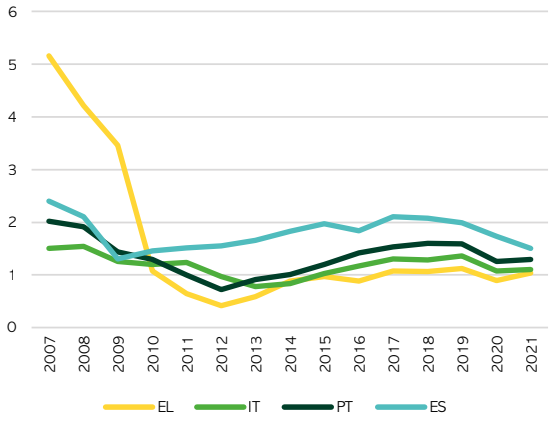


Fig. 11.4 Investment in Transport equipment in Central and Eastern Europe (% GDP)

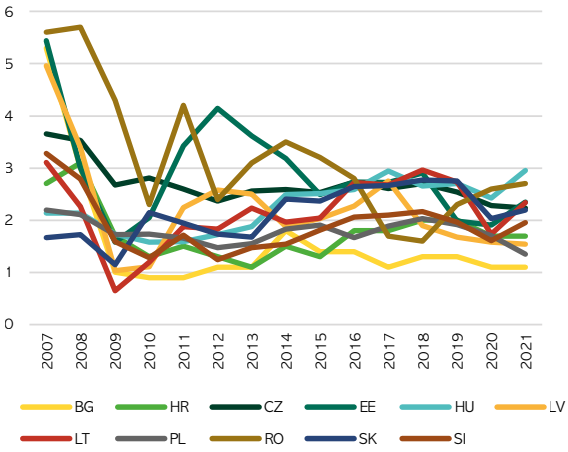


Fig 11.5 Investment in Transport equipment in Oceania and North America (% GDP)

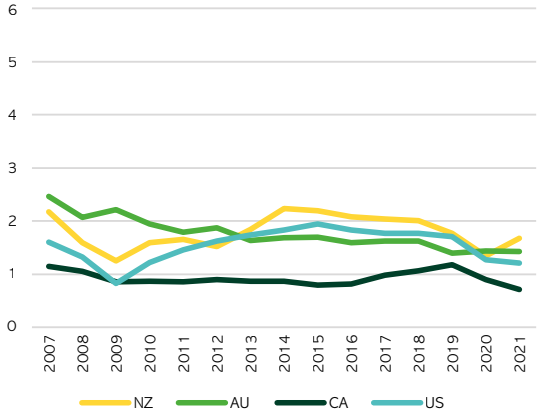
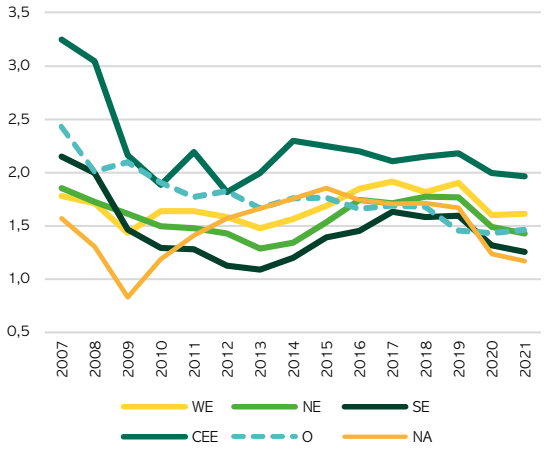


Fig. 11.6 Investment in Transport equipment by region (% GDP)

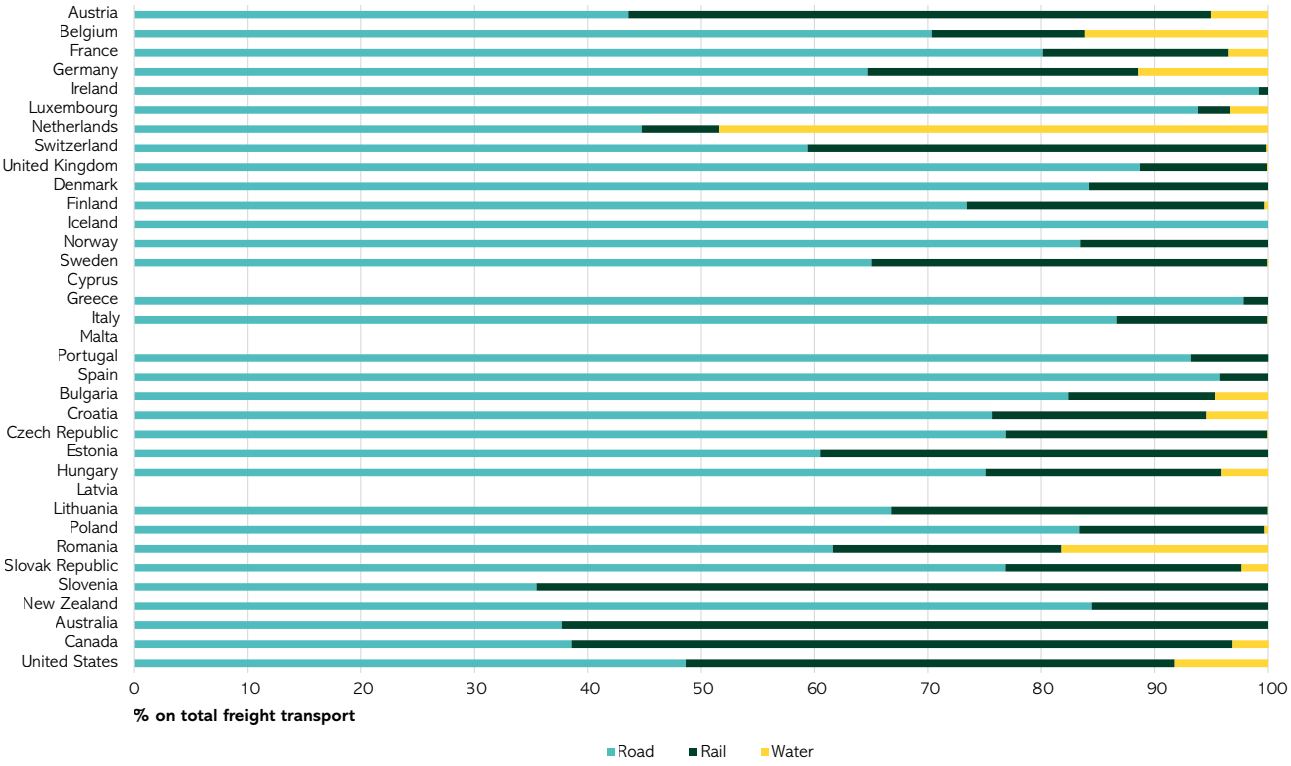


Sources: Elaborated by authors based on OECD (2023) and EUROSTAT (2023)

3.3.2. Input by activity

As we have seen in the former section, infrastructure investment covers spending on new transport construction and the improvement of the existing network. Infrastructure investment is a key determinant of performance in the transport sector and the whole economy and society. In this section we examine the four main activities of transport: road, rail, maritime ports and airports[4]. The investment infrastructure indicators are measured as a percentage of GDP in the countries of the defined regions during the period between 2007-2021 for: roads (Table 10.1 and Figure 12.1-6); railways (Table 10.2 and Figure13.1-6); Sea ports (Tables 10.3 and Fig 14.1-6); and airports (Table 10.4 and Figure 15.1-6). We will examine the trends in investment in the former categories.

Figure 12: Shares of inland road, railway and waterway freight in total transport (average 2007-2021)



Source: Elaborated by authors based on OECD (2023

[4] Our study does not consider inland waterway transport infrastructure, which is, nevertheless, important in some countries, such as the Netherlands (48.4% on average 2007-2021) and also in other Western European but much lower: Germany (11.4% 2007-2021), Belgium (16.2% 2007-2021) and Romania 18.2% (2007-2021).

Road investment

Road investment includes capital expenditure on new road infrastructure or on the extension of existing roads, including reconstruction, renewal (major substitution work on the existing infrastructure which does not change its overall performance) and upgrades (major modification work improving the original performance or capacity of the infrastructure). Infrastructure includes permanent way constructions, buildings, bridges and tunnels, as well as immovable fixtures, fittings and installations connected with them, as opposed to road vehicles.

In the Western European region, investment in roads was relatively stable, at around 0.4% of GDP. This ratio was highest in Switzerland, at around 0.7%, and lowest in Belgium and Austria, at around 0.15% in both cases. As we have seen elsewhere, Ireland exhibited the most drastic change since in 2007 it had the highest ratio in this region, at around 1.1%, this declining to 0.3% in 2012 and then to 0.2% between 2013 and 2019 (Figure 12.1).

For Northern Europe, like the case of Western Europe, road investment ratios were also stable, ranging between 0.5% and 0.8% throughout the period. However, there were some exceptions. Firstly, Iceland, which increased from 1.2% in 2007 and 2% in 2008, then plummeted to around 0.4% between 2009 and 2019. Secondly, Norway saw a notable increase in road investment from 0.6% in 2007 to 1.1% in 2019. The rest of the region was stable in term of road investments, with small fluctuations, and figures by 2021 were not significantly higher or lower than the 2007 levels (Figure 12.2).

In Southern Europe, we have full data across the period for only three countries in this group. Greece saw its road investment levels increase from 0.7% in 2007 to 2.2% in 2017 (Figure 12.3). Since then, its investment ratio declined to 0.4% from 2019 to 2021. The other regularly reporting countries also exhibited a gradual decline in road investment, Spain from 0.9% in 2009 to 0.3% by 2019, and Italy from 0.8% in 2007 to around 0.2% between 2010 and 2020.

The Central and Eastern Europe region exhibited the highest levels of volatility in road investment, which declined along the whole period. Between 2007 and 2008, the highest levels of investment were found in Romania (2.5%), Croatia (2.4%) and Slovenia (1.8%), which were far beyond the other European countries. This can partially be explained by EU structural funding. Other countries started with lower ratios (Bulgaria 0.7% in 2007-2009, Hungary 0.7% in 2007-2008, and Poland 1.1% in 2007-2008) but these ratios gradually increased thanks to EU structural funding (Bulgaria 1.5% in 2012-2015, Hungary 1.7% in 2009, Poland 2% in 2009-2011). On average, Central and Eastern EU countries exhibited higher ratios of road investment than the rest of the European regions across the whole period (2007-2021). However, at the same time, the regional average ratio of road investment declined from around 1.2% in 2007-2010 to 0.8% from 2013 to 2021 (Figure 12.4).

In the two countries from Oceania, road investment ratios remained stable across the whole period, being relatively high in Australia (1.1%) and at an intermediate level in New Zealand (at 0.6%). In North America, road investment was stable in the US (at around 0.5% between 2007 and 2021). Canada increased its ratio during the financial crisis, from 0.7% in 2007 to 1.2% in 2010 and 2011, after which it declined to 0.4% and 0.5% from 2014 to 2019 (Figure 12.5).

In sum, by region, the highest investment ratios were in Central and Eastern Europe during the whole period, and from 2012 to 2021, also, in Oceania. The other regions invested at lower rates and exhibited a downward tendency along the period under study (Figure 12.6).

Figures 12.1-12.6: Road Investment in the countries under study (as a percentage of GDP)

Fig. 12.1 Road investment in Western Europe (% GDP)

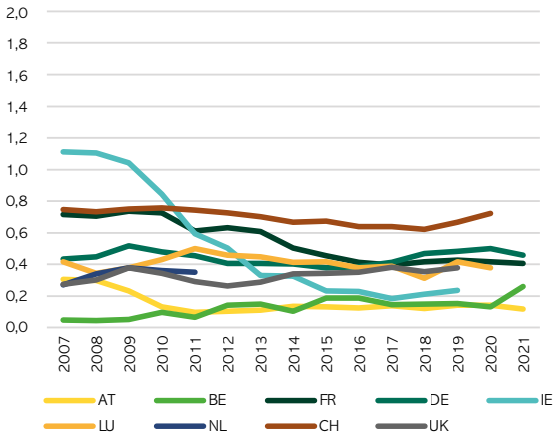


Fig. 12.2 Road investment in Northern Europe (% GDP)

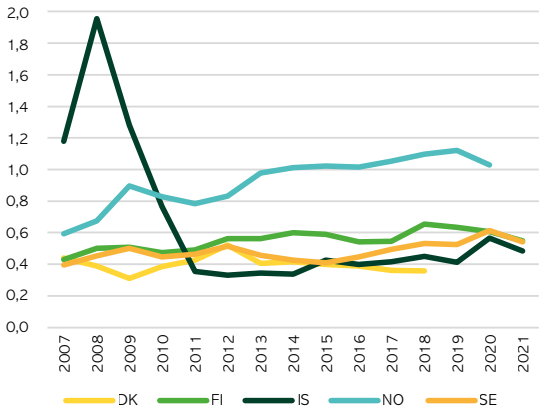


Fig. 12.3 Road investment in Southern Europe (% GDP)

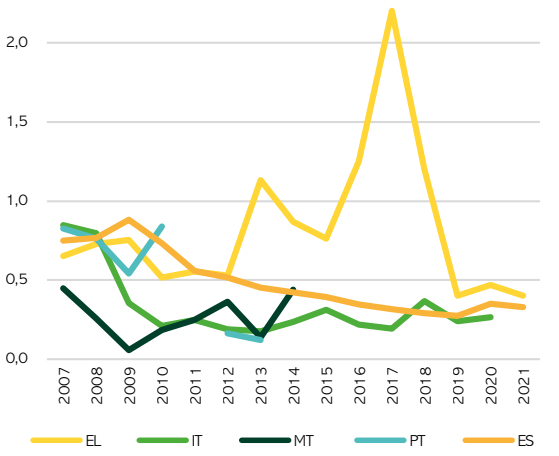


Fig. 12.4 Road investment in Central and Eastern Europe (% GDP)

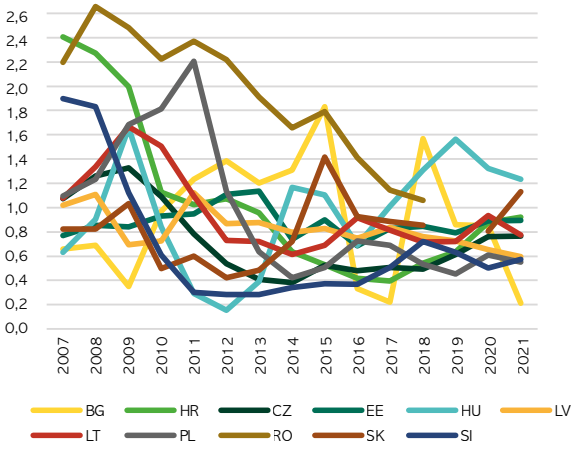


Fig. 12.5 Road investment in Oceania and North America (% GDP)

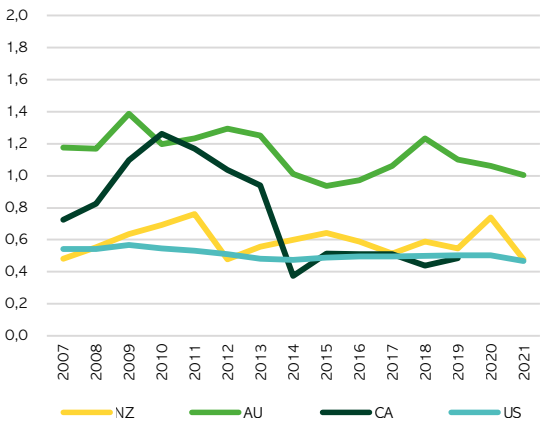
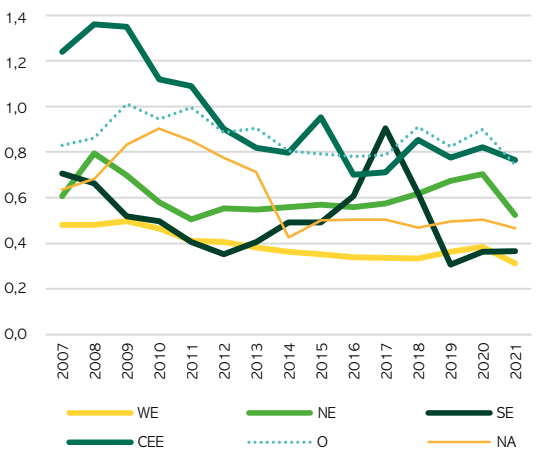


Fig. 12.6 Road investment by region (% GDP)



Source: Elaborated by authors based on OECD 2023 https://stats.oecd.org/Index.aspx?DataSetCode=ITF_INV-MTN_DATA

Railway infrastructure investment

The definition of railway infrastructure investment is capital expenditure on new railway infrastructure, or the extension of existing railways, including reconstruction, renewal (major substitution work on existing infrastructure which does not change its overall performance) and upgrades (major modification work improving the original performance or capacity of the infrastructure). Infrastructure includes land, permanent way constructions, buildings, bridges and tunnels, as well as immovable fixtures, fittings and installations connected with signalisation, telecommunications, catenaries, electricity sub-stations, etc.) as opposed to rolling stock.

In Western Europe, we see different investment patterns by country. However, we can also note something of a convergence between countries (Figure 13.1). At the beginning of the period, countries such as Switzerland and Austria were the highest performers (over 0.6% and 0.5% respectively), a middle group, consisting of countries such as Luxembourg, Belgium and France (between 0.2% and 0.4%), and a low performing group, including Germany, Ireland and the UK (between 0.1% and 0.2%). By the end of the period, all countries had settled within the 0.2% to 0.55% band, representing some move towards convergence. The only exception was Ireland, which started in the lowest band, increased dramatically to 0.8% in 2014, but then fell dramatically to levels under 0.1%. In Northern Europe, growth in this investment category increased overall, particularly in the specific cases of Denmark and Norway, but also in Finland to a lesser extent. They remained stable but at a high level between 0.4% and 0.5% in Sweden. Across the period, as in the case of Western Europe, some convergence between countries could be seen, with initial ratios ranging from 0.1% to 0.4%, and final ratios between 0.25% and 0.5% (Figure 13.2).

Southern Europe saw sharp declines in this category over the period, starting from investment ratios as high as 0.8% in the case of Spain and 0.5% in the case of Italy, but seeing sharp drops during the financial crisis, followed by a convergence to lower investment levels from 2018, where all countries invested under 0.2%. The exception was Italy, which, after falling as its regional peers during the financial crisis, saw an upsurge to 0.6% by 2020 (Figure 13.3).

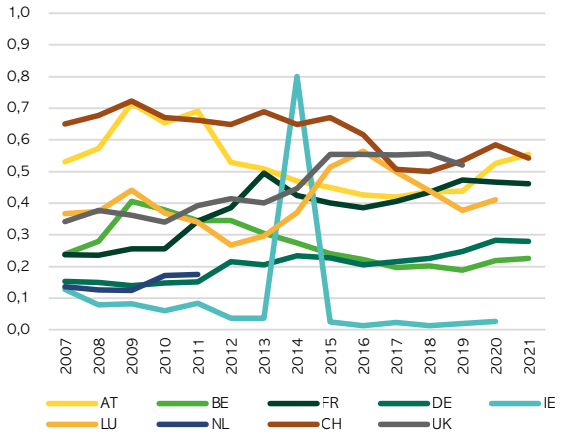
Central and Eastern Europe saw significant volatility in this investment category during the period, which, in contrast to Western and Northern Europe, tended to see greater divergence by 2021 (Figure 13.4). In 2007, investment was at the high of 0.45% in Czech Republic, and the low of 0.15% in the case of Estonia. By 2021, the highest ratio was 0.7% by Slovenia and over 0.1% by Poland. Slovenia experienced the sharpest volatility throughout the period.

In Oceania and North America, investment in this category was rather flat and low, across the whole period. The best performer was Australia, which grew from 0.25% in 2007 to 0.5% in 2021 (Figure 13.5).

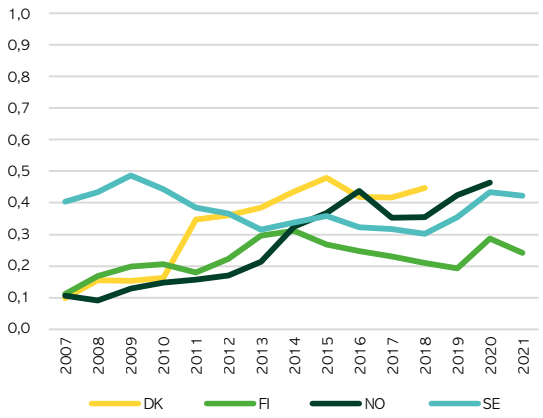
Across all regions, at the beginning of the period, Southern Europe was the most significant investor in this category. However, this fell dramatically during the financial crisis and started to recover from 2019, but was hit again by the COVID-19 pandemic. Western and Northern Europe were more stable, actually growing overall during the whole period, whilst Oceania and Central Europe exhibited volatility, but both also grew during the period. In contrast, this investment category was flat in North America (Figure 13.6).

Figures 13.1-13.6: Rail infrastructure investment in the countries under study (as a percentage of GDP)

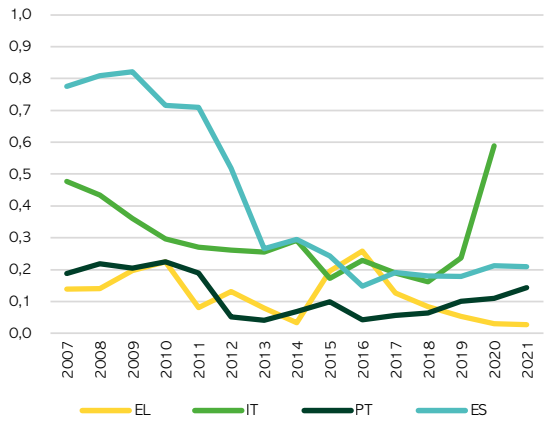
13.1 Rail infrastructure investment in Western Europe



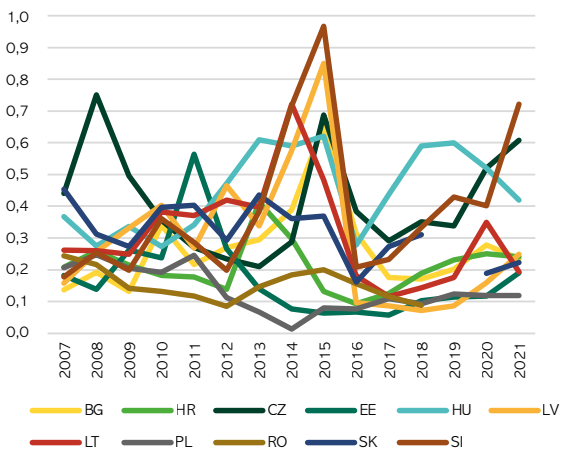
13.2 Rail infrastructure investment in Northern Europe (% of GDP)



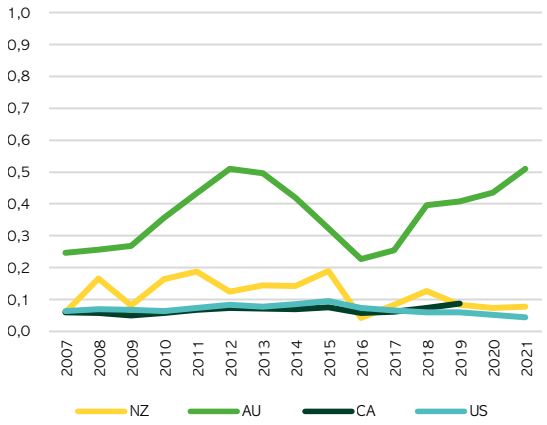
13.3 Rail infrastructure investment in Southern Europe



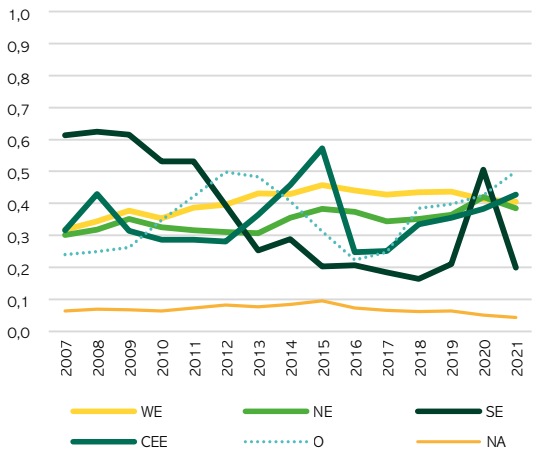
13.4 Rail infrastructure investment in Central and Eastern Europe



13.5 Rail infrastructure investment in Oceania and North America



13.6 Rail infrastructure investment by regions



Source: Elaborated by authors based on OECD 2023 https://stats.oecd.org/Index.aspx?DataSetCode=ITF_INV-MTN_DATA

Maritime port infrastructure investment

Investment in this category can be best described by capital expenditure on new construction, including new maritime ports, or extensions of existing maritime ports, including reconstruction, renewal (major substitution work on the existing infrastructure which does not change its overall performance) and upgrades (major modification work improving the original performance or capacity of the infrastructure). Infrastructure includes land and port approach canals, port facilities machinery and equipment, office and storage buildings, port repair facilities, navigation aids and services, hinterland links, as well as immovable fixtures, fittings and installations connected with them.

Clearly, not all countries included in this study have maritime ports, being particularly the case when countries are land-locked. This should be borne in mind when interpreting results.

In Western Europe, data is missing in this category for Austria, Luxembourg, the Netherlands and the UK. Maritime port investment was stable overall across the period, of the countries that provided full data, Belgium was the best performer in this group, investing between 0.04 and 0.06% (Figure 14.1).

In Northern Europe, whilst the region as a whole was relatively stable, there was internal differences. Sweden was the top performer in 2007, at 0.24%, but fell dramatically, to 0.14% at the end of the period. Finland, though it invested less from the outset, saw similarly sharp falls. Denmark, Iceland and Norway remained much more stable throughout (Figure 14.2).

In Southern Europe, investment was quite strong in 2007, particularly led by Spain, at 0.24%. However, a convergence occurred throughout the period, with a downward tendency, until Italy saw some increases in 2018, and Spain from 2020. Greece was flat and a very low investor in this group (Figure 14.3).

The Central and Eastern European countries also include land-locked countries, such as Czechia, Hungary and Slovakia. This region saw convergence in a downward direction throughout the period, with some internal differences. At the beginning of the period, Latvia was the strongest investor, however, data is missing for the rest of the period. After Latvia, Estonia was the strongest performer, but the 2007 levels of 0.35% were dramatically lowered to under 0.1% for the final years in this period (Figure 14.4).

Finally, Australia was the star performer in the Oceania and North America group, reaching 0.5% by 2012, followed by a sharp decline to 0.1% in 2015 and a continued slump to the end of the period. Information in this category for the US is not available. New Zealand and Canada were quite flat throughout (Figure 14.5).

By region, port investment saw a strong convergence in the period under study. In 2007, the highest performing region, Central and Eastern Europe, invested overall at 0.18%, whilst the lowest, North America, invested at a ratio of under 0.02%. The strongest investors at the beginning of this period, Central and Eastern Europe, Oceania, and Southern Europe, all underwent declines during the period, to 0.07%, 0.04%, and 0.04%, respectively. At the same time, regions which commenced at lower investment levels, such as Northern and Western Europe and North America, tended to remain either stable, or increased slightly (Figure 14.6).

Figures 14.1-14.6: Maritime port investment in the countries under study (as a percentage of GDP)

Figure 14.1 Port investment in Western Europe

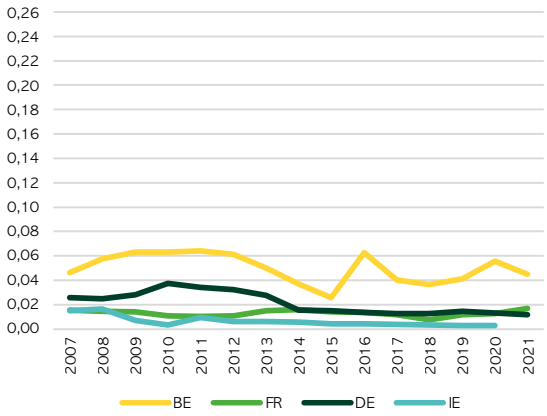


Figure 14.2 Port investment in Northern Europe

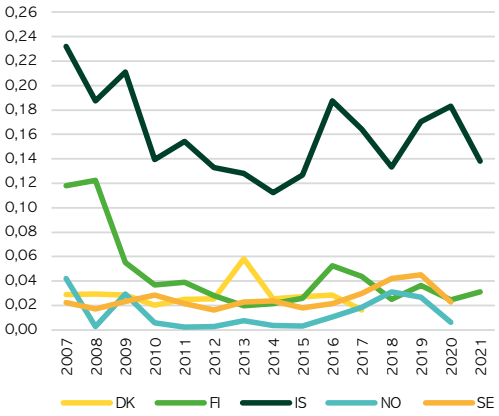


Figure 14.3 Port investment in Southern Europe

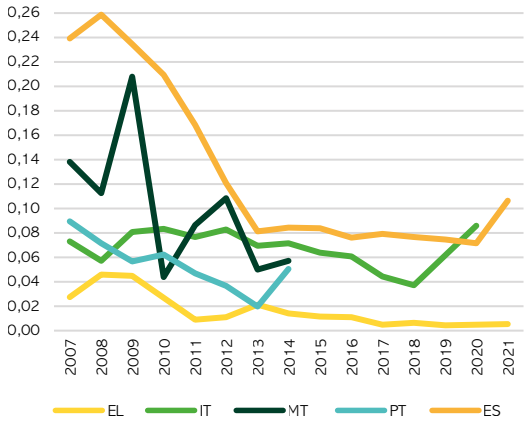


Figure 14.4 Port investment in Central and Eastern Europe

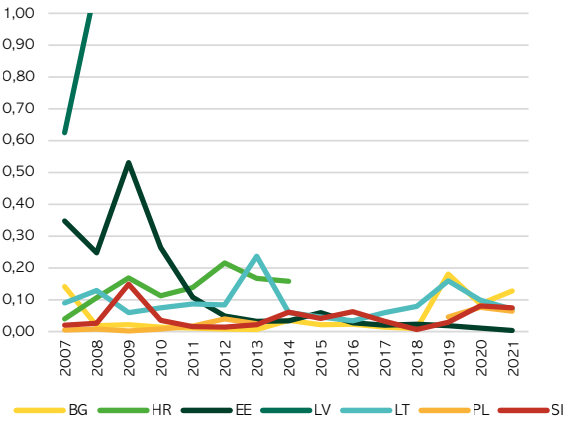


Figure 14.5 Port investment in Oceania and North America

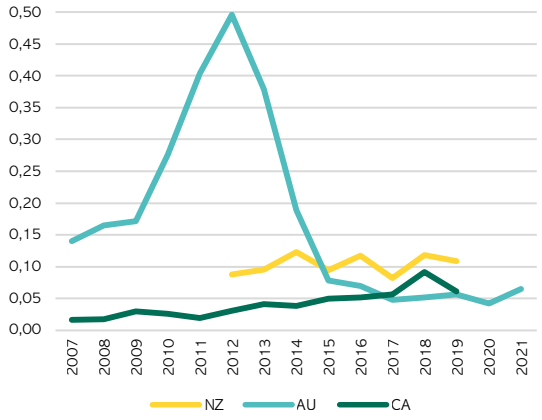
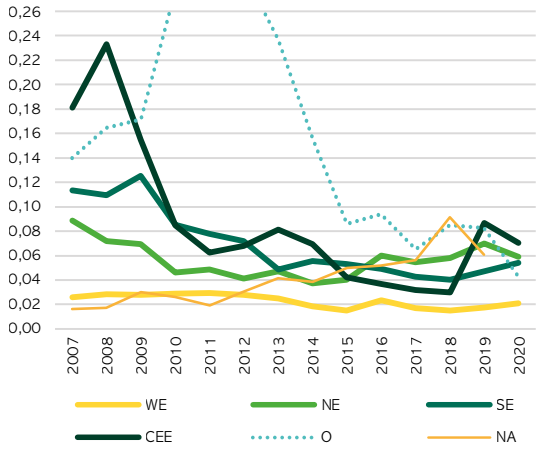


Figure 14.6 Port investment by region



Source: Elaborated by authors based on OECD 2023 https://stats.oecd.org/Index.aspx?DataSetCode=ITF_INV-MTN_DATA

Airport infrastructure investment

This investment category is described as being capital expenditure on new construction (including new airports) or extension of existing airport infrastructure, including reconstruction, renewal (major substitution work on the existing infrastructure which does not change its overall performance) and upgrades (major modification work improving the original performance or capacity of the infrastructure). Infrastructure includes land, airport facilities and associated equipment, office and storage buildings, air navigation systems as well as immovable fixtures, fittings and installations connected with them (signalisation, telecommunications, etc.). Countries' airport infrastructure investment is measured as a percentage of GDP.

In Western Europe, star performer Ireland, reaching 0.3% in 2009, slumped to a much lower investment levels associated with the other countries in this region between the range of 0.01% and 0.05% by 2021 (Figure 15.1).

In Northern Europe, all countries underwent declines overall, despite investment surges in 2016-17 in Norway and 2019 in Finland, to a lesser extent (Figure 15.2).

This investment category also converged downwards in Southern Europe, Spain being the lead investor at 0.2% in 2007, and showing only gradual recovery from its dramatic slump from 2007 onwards, at 0.07% by the end of the period (Figure 15.3).

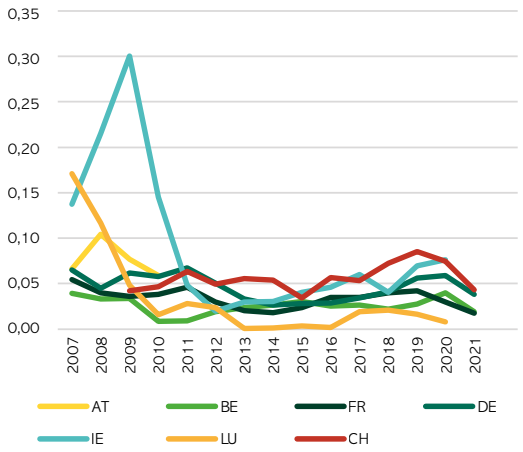
Though investment fell overall in Central and Eastern European countries during the period, most countries exhibited low rates across the whole period. The main exceptions, which exhibited volatility, were Estonia, and Croatia, with peaks at 0.34% in 2008 and 0.37% in 2016, respectively (Figure 15.4).

Finally, in Oceania, New Zealand was a strong performer, reaching 0.2% in 2018, whilst Canada was flat, at between 0.05% and 0.1% (Figure 15.5).

By region, Airport investment underwent a gradual convergence downwards. In 2007, this category had highs of 0.09% in Western Europe and lows of 0.05% in Northern Europe. By the end of the period, regions invested between the high of 0.04% (Northern Europe, representing a slight decline) and 0.03%, in Central and Eastern Europe (quite a fall, from 0.07% in 2007). The exception was Oceania, which, though data is not complete across the period, was the star regional investor and, though it saw declines from 2010, there was recovery to 2018, then a fall to 0.14% by 2019 (Figure 15.6).

Figures 15.1-15-6: Airport investment in the countries under study (as a percentage of GDP)

Figure 15.1 Airport Investment in Western Europe



15.2 Figure Airport Investment in Northern Europe

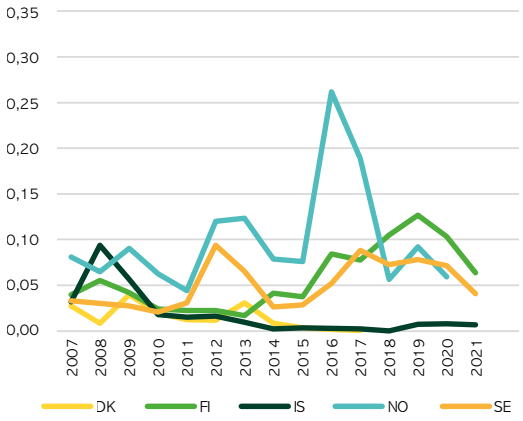


Figure 15.3 Airport Investment in Southern Europe

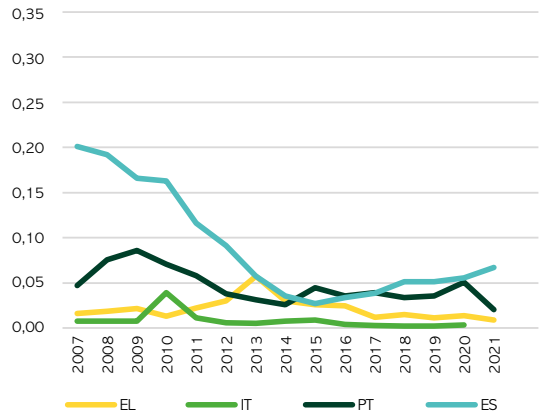


Figure 15.4 Airport Investment in Central and Eastern Europe

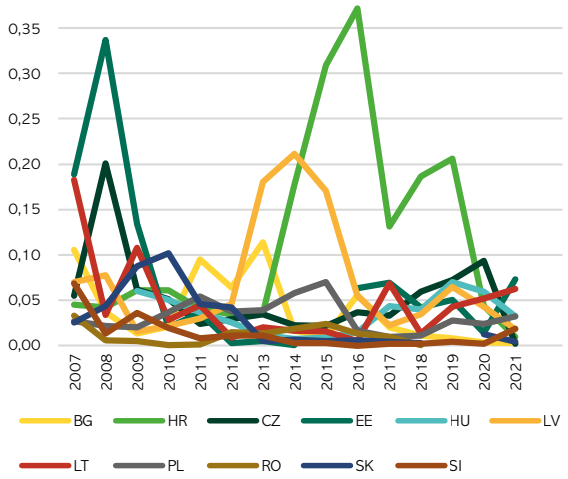


Figure 15.5 Airport Investment in Oceania and North America

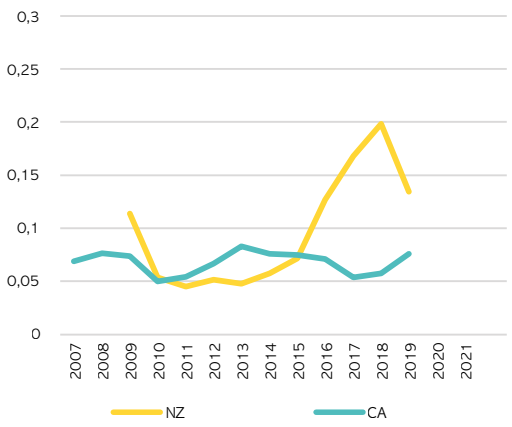
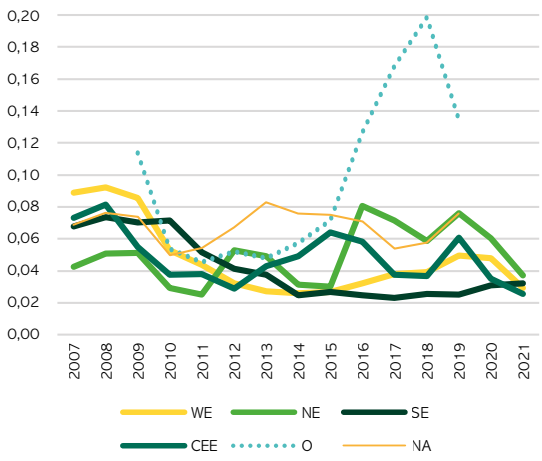


Figure 15.6 Airport investment by region



Source: Elaborated by authors based on OECD (2013) and EUROSTAT (2023)

3.3.3. Outputs and outcomes by activities

We consider outputs of freight and passenger transport starting with Road, followed by Rail, Sea Port and finally, Air transport.

Road freight transport
Road freight transport is any movement of goods using a road vehicle on a given road network. When a road vehicle is being carried on another vehicle, only the movement of the carrying vehicle (active mode) is considered. To evaluate the performance of this activity, we estimate the number of tonne–kilometre (Ton-km) in relation to GDP in constant dollars of 2014 (GDP 2015 USD).[5] The unit of analysis is therefore Ton-km per GDP 2015 USD.

In Western Europe, rail freight measured by Ton-km per GDP 2015 USD tended to converge downwards in the period under consideration. In 2007, the lead performer was Luxembourg, at between 170-180 Ton/km per GDP 2015 USD, but then fell towards its peers, to under 120 by 2019. The other countries in this region declined, slowly, so final amounts ranged from highs (bar Luxembourg) of 90 Ton-km per GDP USD in Germany to around 20 tons/km in Switzerland (Figure 16.1).

In Northern Europe, road freight was much more stable for all countries in the region. The lead performer in this group was Finland, hovering at 120 tons/km most of the period (Figure 16.2).

Southern Europe exhibited much more diversity as a group. Spain and Portugal were clear leaders in 2007, at around 220 Ton/km per GDP 2015 USD, but their trajectory differed. Whilst both fell after 2007, Spain fully recovered by the end of the period, whilst Portugal´s levels fell more sharply, with only partial recovery to 140 tons/km by the end of the period. Italy was flat throughout the period, whilst Greece saw improvements, peaking at around 140 Ton-km per GDP USD in 2018, and falling somewhat since then (Figure 16.3).

In Central and Eastern Europe, initial results were, as a group, high, with leader Lithuania at over 500 Ton/km per GDP 2015 USD growing impressively to over 1000 by 2018. Poland followed, as the second-best performer in this group. Most of the other countries in this group saw slight declines, but still from strong positions, when compared with countries in other groups. Slovenia was the exception, with lower and stable levels always under 100 Ton-km per GDP 2015 USD (Figure 16.4).

Finally, Oceania and North America exhibited relative stability, between the 130-200 Ton-km per GDP 2015 USD range throughout the period (Figure 16.5).

On comparing the regions, the strong performance of Central and Eastern Europe is clear across the period, which exhibited results well above all the other regions, whose results were both lower and either flat or on a modest decline over the period (Figure 16.6).

[5] For further information, see “Performance on ROAD TRAFFIC” at OECD (2023)

Figures 16.1-16.6: Road freight transport in the countries under study (measured as Ton-km per GDP, in 2015 thousand USD)

Figure 16.1 Road freight in Western Europe

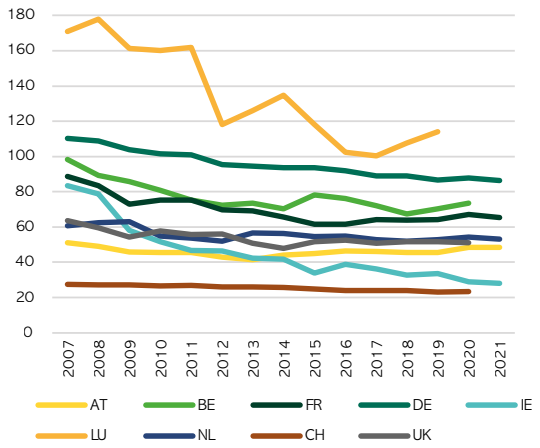


Figure 16.2 Road freight in Northern Europe

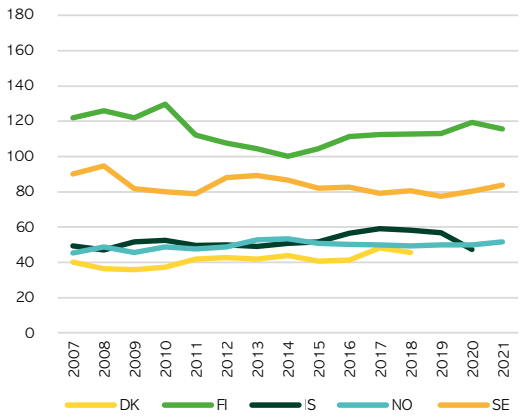


Figure 16.3 Road freight in Southern Europe

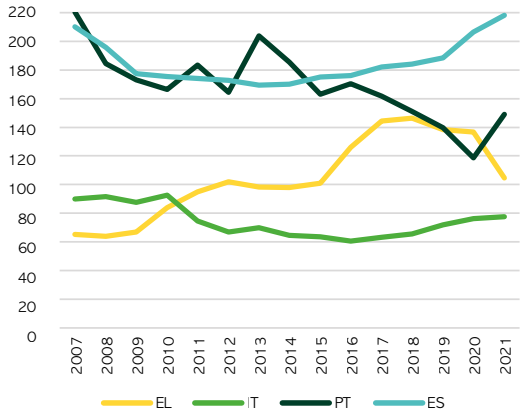


Figure 16.4 Road freight in Central and Eastern Europe

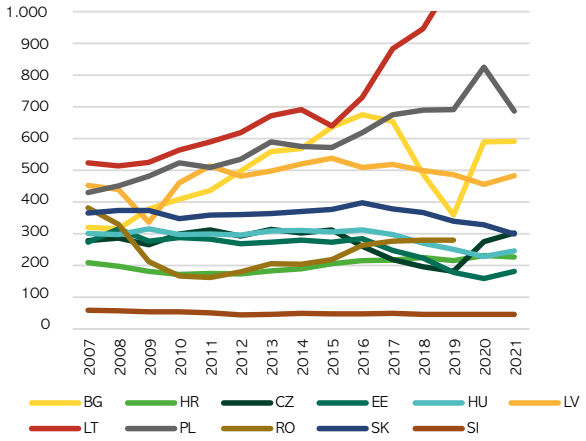


Figure 16.5 Road freight in Oceania and North America

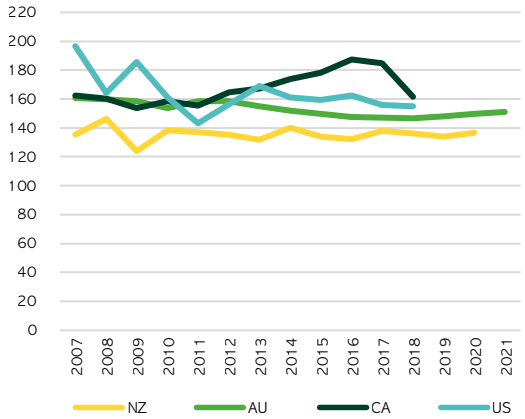
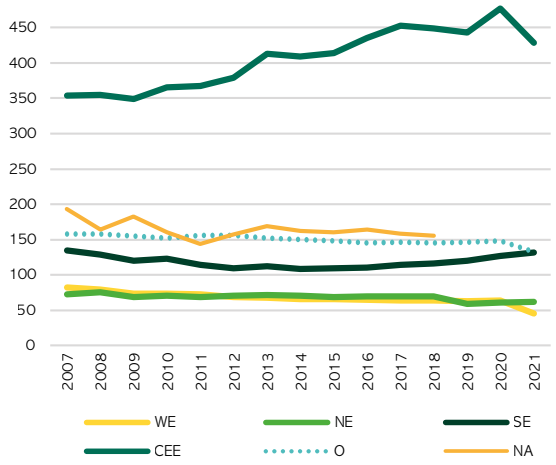


Figure 16.6 Road freight by region



Source: Elaborated by authors based on OECD 2023 https://stats.oecd.org/Index.aspx?DataSetCode=ITF_INV-MTN_DATA

Road passengers carried

Road passenger transport is any movement of passengers using a road vehicle on a given road network. When a road vehicle is being carried on another vehicle, only the movement of the carrying vehicle (active mode) is considered. To evaluate the performance of this activity we estimate the number of million passengers–km in relation to the GDP in constant dollars of 2015 (the unit of analysis is passenger-km per GDP 2015 USD).

As regards road passenger transport, Western Europe and Northern Europe exhibit very similar patterns. In both cases, there was a great deal of stability throughout the period, and a clear pattern of leader countries. For example, in Western Europe, France was the leader country, carrying between 300-350 passenger-km/ GDP 2015 USD throughout the period. Germany followed, then Belgium. The lowest performer was Switzerland, hovering at around 150 passenger-km/GDP 2015 USD throughout the period (Figure 17.1).

In Northern Europe, the star performer was Iceland, which peaked at over 400 passenger-km/GDP 2015 USD in 2017, but did not drop below 330 passenger/km at any time. Finland was second in this regard, with a stable result of around 300 passenger-km/GDP 2015 USD. Norway showed the lowest figure, at around 170 passenger-km/GDP 2015 USD for the whole period (Figure 17.2).

In Southern Europe there is a complete data set only for Italy and Spain. Initially high results declined sharply throughout the period. Italy led, at 400 passenger-km/GDP 2015 USD in 2007, falling to over 300 passenger-km/ GDP 2015 USD by the end of the period. Spain saw a more gradual decline, from 320 to 250 passenger-km/GDP 2015 USD over the same period. Results for the other members of this group were lower, but data is incomplete (Figure 17.3).

Central and Eastern Europe exhibited the highest results for any group, led by Slovenia, which peaked at 700 passenger-km/GDP 2015 USD by 2009, however, from this date, data is incomplete (Figure 17.4). Hungary showed high and stable results, of around 600 passenger-km/GDP 2015 USD throughout most of the period. The other members of this group all showed high, though declining, results in this period, with the lowest performer, Slovakia, still significantly above rates in many other countries in other regions. Results for the other members of this group is limited to five out of eleven countries.

Finally, in Oceania and North America, countries exhibited gradual declines across the period. The United States was the leader in this group, starting at around 350 passenger-km/GDP 2015 USD in 2007, and continuing at that level. Australia and New Zealand had both lower levels and clearer, if gradual, declines, Australia at around 270 and New Zealand at 185 passenger-km/GDP 2015 USD respectively (Figure 17.5).

By region, the prominence of Central and Eastern Europe, albeit in decline across the period, can be seen. Southern Europe and North America saw a partial convergence with this leader region from 2017. The other regions exhibited lower results, all in modest decline, especially in the second half of the period under study (Figure 17.6).

Figures 17.1-17.6: Road passenger carried, in the countries under study, measured by passenger-km/GDP 2015 USD

Figure 17.1 Road passenger in Western Europe (passenger-km-per GPD 2015USD)

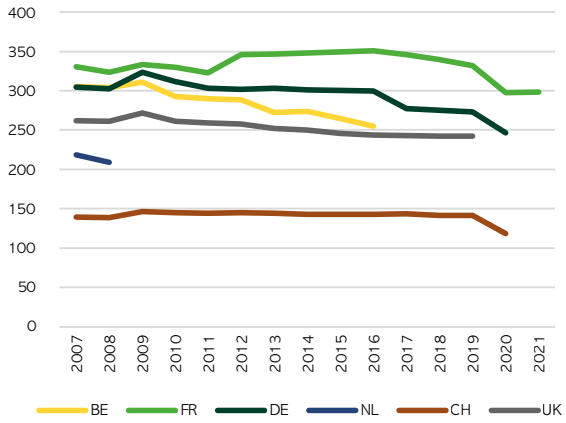


Figure 17.2 Road passenger in Northern Europe (passenger-km-per GPD 2015USD)

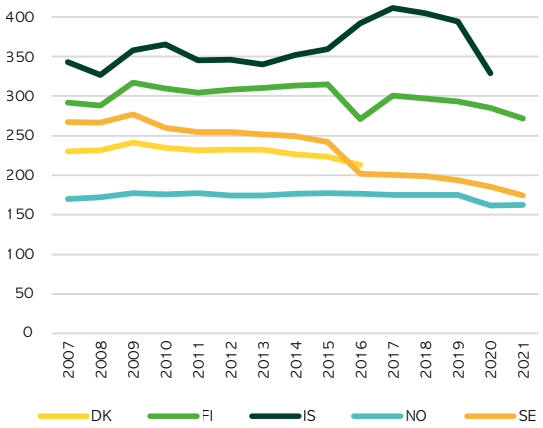


Figure 17.3 Road passenger in Southern Europe

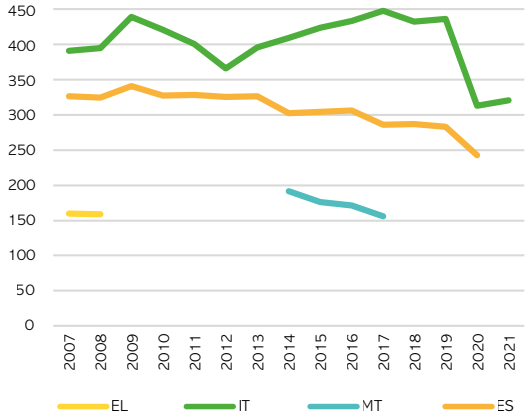


Figure 17.4 Road passenger in Central and Eastern Europe

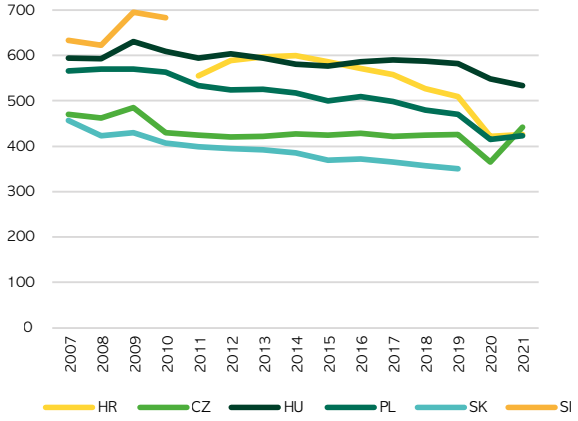


Figure 17.5 Road passenger in Oceania and North America

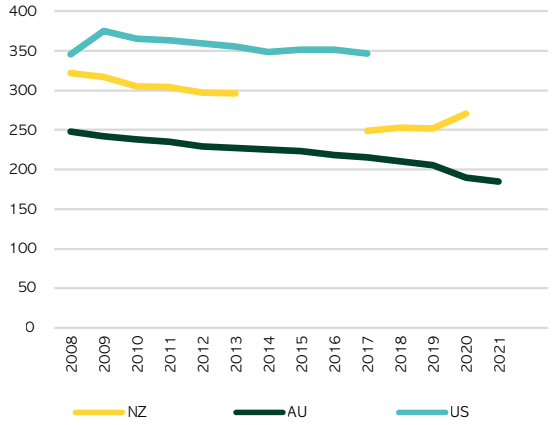
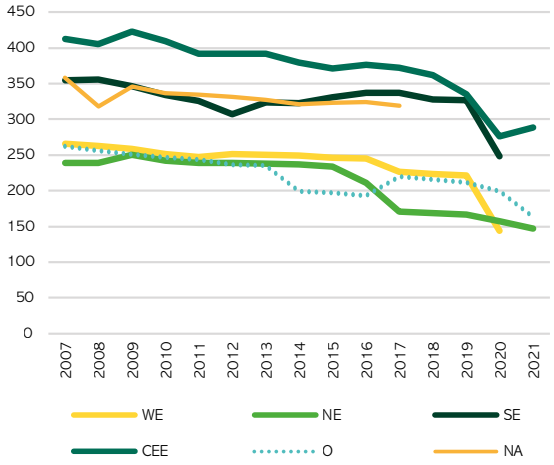


Figure 17.6 Road Passenger by region



Source: Elaborated by authors based on OECD (2023) and EUROSTAT (2023)

Rail freight transport

Rail freight transport is defined as any movement of goods using a rail vehicle on a given rail network. Further, national rail freight transport is defined as rail freight transport between two places (a place of loading/embarkation and a place of unloading/disembarkation) located in the same country. This may involve transit through a second country. In contrast, International rail freight transport is defined as rail freight transport between a place (of loading/embarkation or unloading/disembarkation) in one country and a place (of loading/embarkation or unloading/disembarkation) in another country. This may also involve transit through one or more additional countries. A standard unit measure of rail freight used by OECD (2023) and the World Bank (2023) is tonne-kilometre (Ton-km or tkm), which represents the transport of one tonne of goods by rail over a distance of one kilometre. To evaluate the performance of railway freight between 2007 and 2021, we estimate the number of tkm per one thousand units of the country by GDP in constant dollars of 2015 (2015 USD).[6] Units are stated therefore as Ton-km/GDP USD 2015.

When examining rail freight in the countries under study in this chapter, it can be observed that Western and Northern Europe exhibited similar patterns, both regions including a group of stronger and weaker performers. In Western Europe, Austria, in particular, but also, Germany, were strong performers, with stable performance throughout the period. Austria's result was between 50 and 60 Ton-km/GDP USD 2015, and Germany's between 30 and 40 Ton-km/GDP USD 2015. In a second group of countries, performance is less strong: here, the sub-group leader is Switzerland, with a result between 17 and 20 Ton-km/GDP USD 2015 for the entire period, followed closely by France and Belgium. Greece is the worst performer in this category, followed by Luxembourg (Figure 18.1).

Again, in Northern Europe, there are two sub-groups in this category. Sweden and Finland are the lead performers, at between 40 and 50 and around 40 Ton-km/GDP USD 2015, respectively, for the whole period. Weaker performers are, therefore, Norway and Denmark, which score 10 or less for the whole period (Figure 18.2).

Countries in Southern Europe score similarly to the poorer performers in Northern Europe (Figure 18.3). All members of this group tended to follow a stable, but relatively low, level, led by Portugal as performing only slightly better than Italy across the period under study. Spain follows, whilst Greece trails behind, with results usually under 3 Ton-km/GDP USD 2015.

Countries in Central and Eastern Europe show dramatic volatility with a tendency to downward convergence. At the outset, Estonia is a star performer, with a result of over 350 Ton-km/GDP USD 2015, however, this drops sharply, from 2007 onwards, to the low levels of most of the other countries in this group, at around 60 Ton-km/GDP USD 2015 by the end of the period. However, there are exceptions to these lower results: Lithuania and Latvia, though data is incomplete across the whole period, exhibit very high rates of between 250 and 350 Ton-km/GDP USD 2015 towards the end of the period (Figure 18.4).

Rail freight in Oceania and North America is also strong, especially in the case of Australia, Canada and the US. Australia leads the group, reaching 300 Ton-km/GDP USD 2015 on a constant level from 2014. Next is Canada, hovering around a 250 Ton-km/GDP USD 2015 result throughout the period. The US sees a decline, from around 150 to over 100 Ton-km/GDP USD 2015, whilst New Zealand has the lowest but stable level, at around 25 Ton-km/GDP USD 2015 (Figure 18.5). Finally, when considering rail freight comparatively by region, the prominence of Oceania is apparent, with North America and Central and Eastern Europe somewhat lower, and on a downward trend. The other regions are relatively flat with lower values (Figure 18.6).

[6] For further details, see OECD 2023 and World Bank 2023

Figures 18.1-18.6: Rail freight transport in the countries under study, measured by Ton-km/GDP USD 2015

Figure 18.1 Rail freight in Western Europe

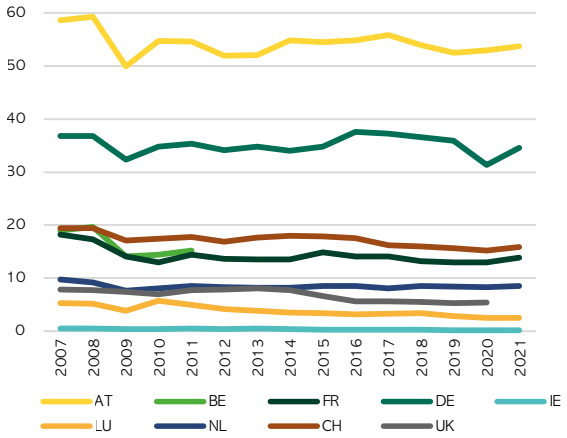


Figure 18.2 Rail freight in Northern Europe

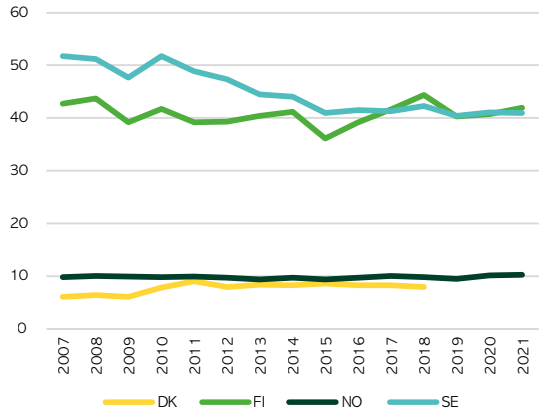


Figure 18.3 Rail freight in Southern Europe

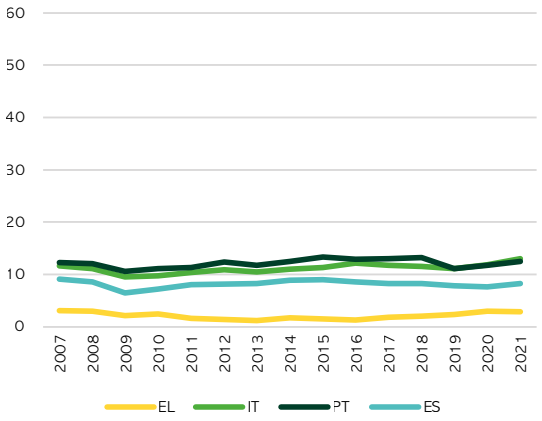


Figure 18.4 Rail freight in Central and Eastern Europe

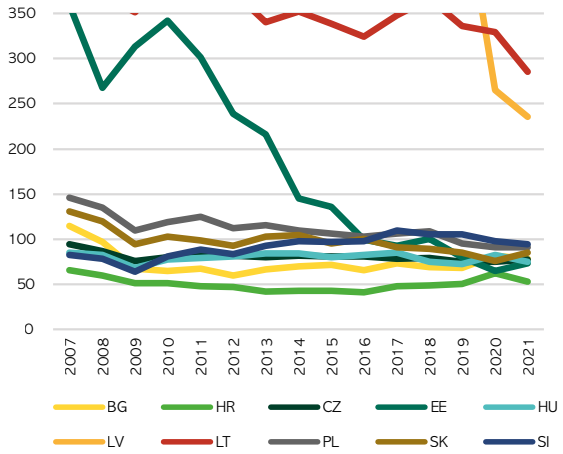
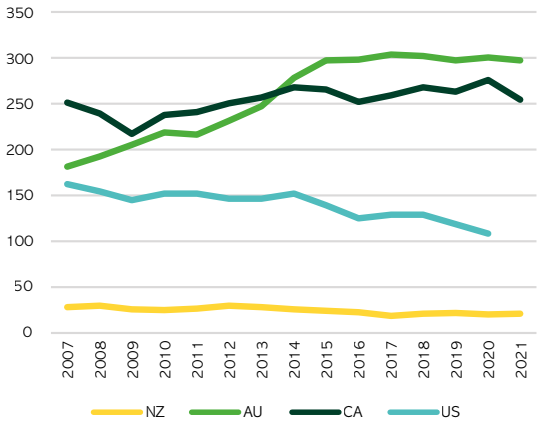
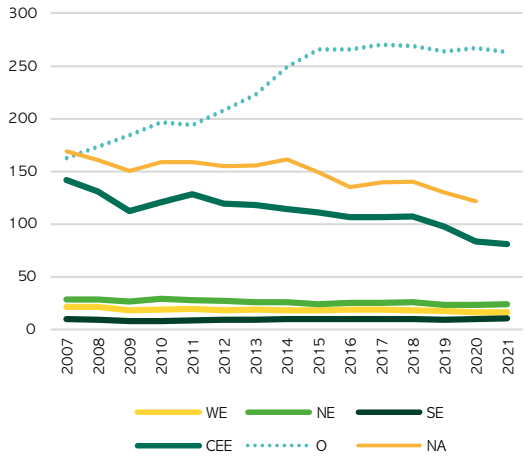


Figure 18.5 Rail freight in Oceania and North America



18.6 Rail freight by region



Source: Elaborated by authors based on OECD (2023)

Railway passenger transport

Railway passenger transport refers to any movement of passengers using a rail vehicle on a given rail network. To evaluate the performance of this activity, we estimate the ratio between the total transport performance of passengers by rail by kilometres travelled (passenger-km) per GDP in constant dollars of 2015 (GDP 2015 USD). The unit of measurement is, therefore, passenger-km/GDP USD 2015.[7]

Following from this, as regards railway passengers, Western Europe, Northern Europe and Southern Europe exhibited similarities as regards results and sub-groups of countries. In Western Europe, France stands out for superior performance at 40 passenger-km/GDP USD 2015 in 2007 and, although it experienced a fall in numbers due to COVID-19 in 2020, recovery is strong from 2021. A cluster of countries including Ireland as sub-group leader, sees very stable results until COVID-19, though recovery is somewhat differentiated. Ireland sees a good recovery, for example, whilst Belgium´s recovery is more ambiguous (Figure 19.1).

In Northern Europe (Figure 19.2), similarly, there are two sub-groups of countries. Sweden leads the strongest performing sub-group. Norway is the lowest performer in this group, starting from under 10 passenger-km/GDP USD 2015. All countries were similarly affected by COVID-19, and their recovery is more homogenous than those in Western Europe.

Southern Europe also exhibits two sub-groups by performance. Italy leads the best performing group, which includes also Portugal and Spain (Figure 19.3). The decline due to COVID-19 was also sharp in this region, but recovery is clear. Greece trails as the sole member of the other group, and recovery after COVID-19 is not particularly convincing.

For Central and Eastern Europe, Hungary is a strong group leader, starting out with nearly 75 in 2007 (Figure 19.4). Though this undergoes decline, particularly sharp due to COVID-19, partial recovery means the result in 2021 is at 36. A cluster of countries, including Czech Republic, Poland, Slovakia, Bulgaria, have initial results between 30 and 55 passenger-km/GDP USD 2015; there is some volatility across the period but, by 2021, the band of results is between 25 and 32 passenger-km/GDP USD 2015, indicating decline was only partial. Lower performing countries, including SI, Estonia and Lithuania converge downwards from already lower levels, compared to the other countries in this group, to a band range of between 6 and 10 passenger-km/GDP USD 2015.

Finally, results for Oceania and North America are the lowest when compared to the other regions. Of these, Australia is the strongest performer, declining with no recovery in sight since COVID-19 (Figure 19.5).

Looking across all regions comparatively, Central and Eastern Europe leads, followed by Western, Southern and Northern Europe. All of these regions saw declines coinciding with the COVID-19 pandemic. Lower values are found in North America and Oceania (Figure 19.6).

[7] We follow the World Bank definition: Passengers carried by railway is measured by the number of passengers transported by rail multiplied by kilometres travelled in relation to the GDP in constant dollars of 2015 (2015 USD). For EUROSTAT, this indicator is defined as the ratio between the total transport performance of passengers using the inland modes (road and rail), expressed in passenger-kilometres and GDP 2015 USD. https://ec.europa.eu/eurostat/cache/metadata/en/tran_hv_pstra_esms.htm

Figures 19.1-19.6: Railway passengers transport in the countries under study measured by passenger-km/GDP USD 2015

Fig. 19.1 Railway passengers in Western Europe

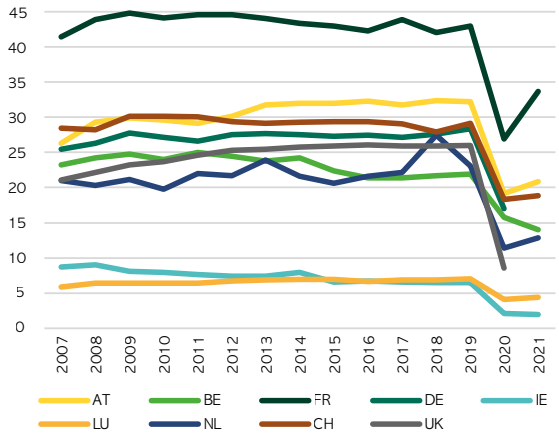


Fig 19.2 Railway passengers in Northern Europe

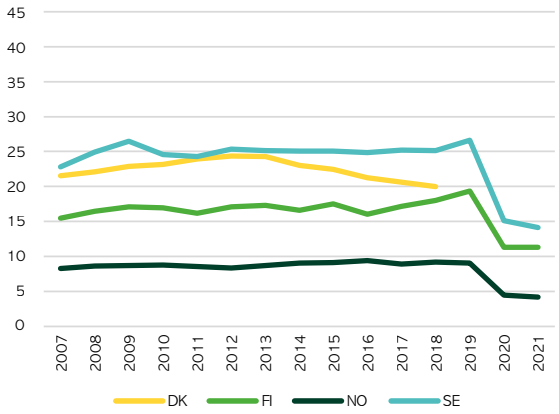


Fig. 19.3 Railway passengers in Southern Europe

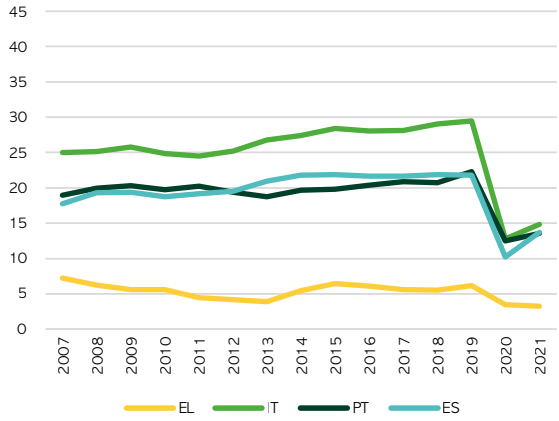


Fig. 19.4 Railway passengers in Central & Eastern Europe

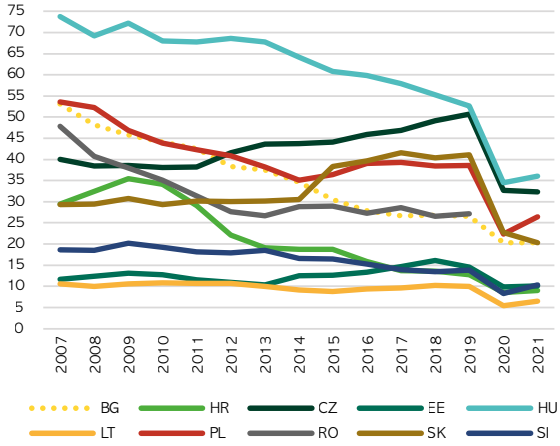
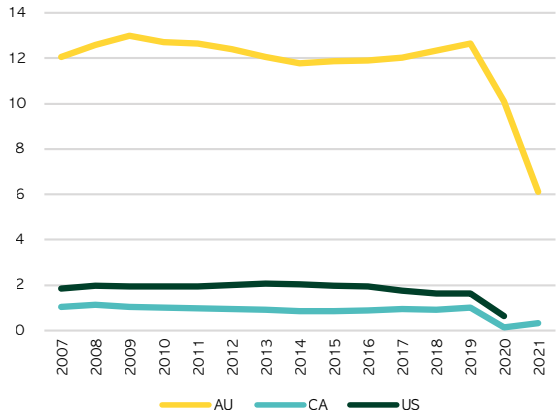
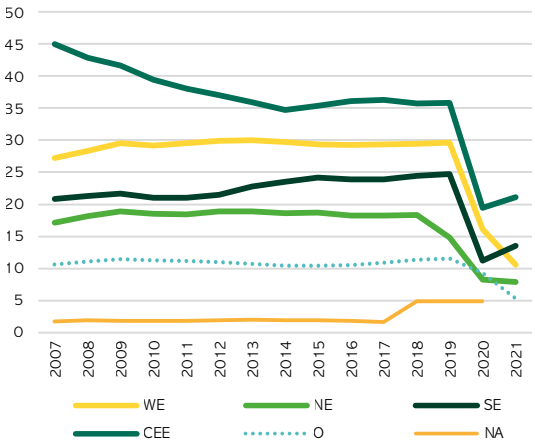


Fig 19.5 Railway passengers in Oceania & Norh America



19.6 Rail passengers by region



Source: Elaborated by authors based on OECD (2023)

Port traffic in Containers

Container transport is defined by the transportation of goods in standardized re-sealable transportation boxes by rail and sea. Data are expressed in tonnes and TEU (Twenty-foot Equivalent Unit). TEU is based on a container of 20-foot length (6.10 m) providing a standardised measure of containers of various capacities and for describing the capacity of container ships or terminals. One 20-foot container equals 1 TEU.[8] To examine the economic performance of Port traffic in Containers we follow OECD (2023) and World Bank (2023) and estimate the number of TEU per one thousand units of the country GDP in constant dollars of 2015 (GDP per 2015 USD). The unit of analysis is, therefore, TEU/GDP USD 2015[9]

Turning to the data on Port traffic in containers the countries under study in this chapter, Western and Northern Europe, respectively, had clear leaders in their groups and, also, a sub-group of followers, all in a generalized context of stability. For Western Europe, the clear leader country was Belgium, followed by the Netherlands (Figure 20.1). Overall, across the period, both countries saw some modest increases to their traffic. Behind them, with much lower traffic, are all the other countries in this group. Similarly, in Northern Europe, the clear leader here was Iceland; again, the other countries in this group had much lower, but stable, traffic (Figure 20.2).

In Southern Europe, there was more change to traffic volumes. Greece was the leader, seeing a sharp increase in traffic from 2008 onwards, reaching around 33 TEU/GDP USD 2015 by 2020, with a fall since COVID-19. Spain followed behind, growing from 10 to 15 TEU/GDP USD 2015 by the end of the period (Figure 20.3).

As in the case of Southern Europe, Central and Eastern Europe (Figure 20.4) saw changes during the period, albeit less dramatic than in the case of Greece. Here, Slovenia was the group leader, overseeing a growth in traffic from around 7 to 20 TEU/GDP USD 2015 by the end of the period. Latvia followed, also doubling its traffic in the period. The rest of the countries exhibited more stability, with a trend to slight decreases in their traffic throughout the period.

As in Western and Northern Europe, traffic in Oceania and North America was stable (Figure 20.5). The US was the leader across the period, with the other members of this group exhibiting lower and stable traffic.

Finally, comparing across the regions, the growing prominence of Southern Europe, followed by Oceania, can be seen. Western Europe represents an intermediate player, with Belgium and the Netherlands as top performers in their group, and Central Eastern Europe as a growing intermediate player, with Slovenia as a key player in the group, with the rest of the regions showing lower and flat values (Figure 20.6).

[8] See OECD 2023 https://data.oecd.org/transport/container-transport.htm#indicator-chart
[9] See OECD 2023 https://stats.oecd.org/Index.aspx?DataSetCode=ITF_INV-MTN_DATA

Figures 20.1-20.6: Port traffic in Containers in the countries under study, measured as TEU/GDP USD 2015

Fig. 20.1 Container port traffic in Western Europe

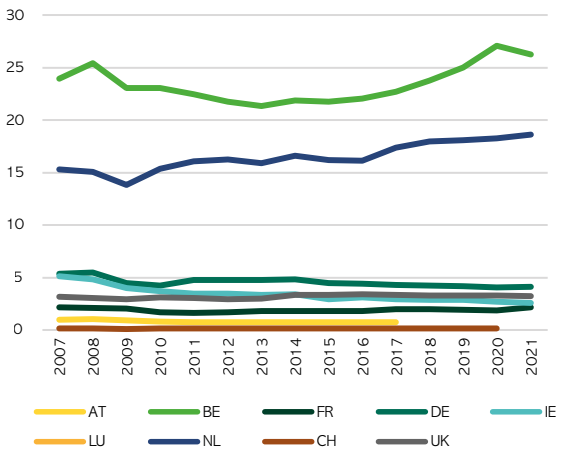


Fig. 20.2 Container port traffic in Nothern Europe

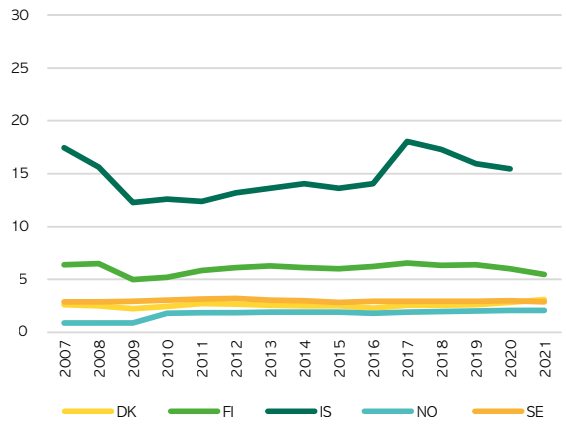


Fig.20.3 Container port traffic in Southern Europe

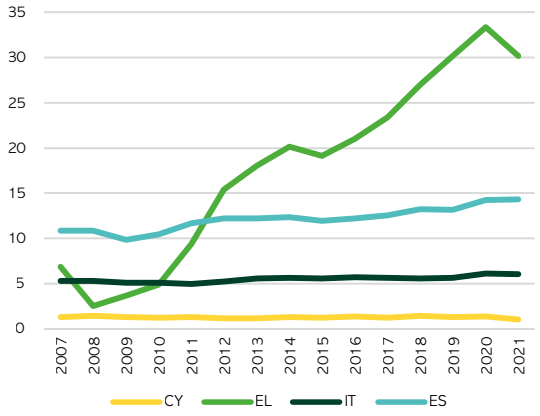


Fig. 20.4 Container port traffic in Central & Eastern Europe

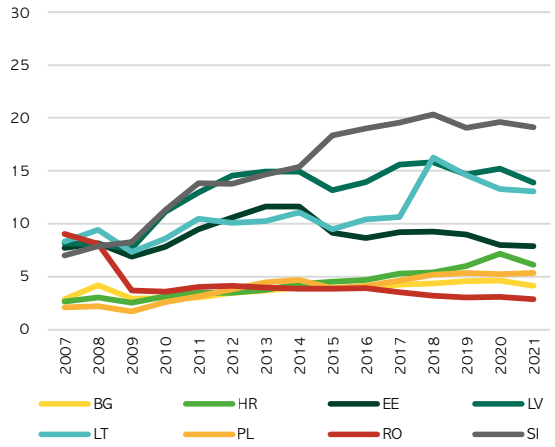


Fig. 20.5 Container port traffic in Oceania and North America

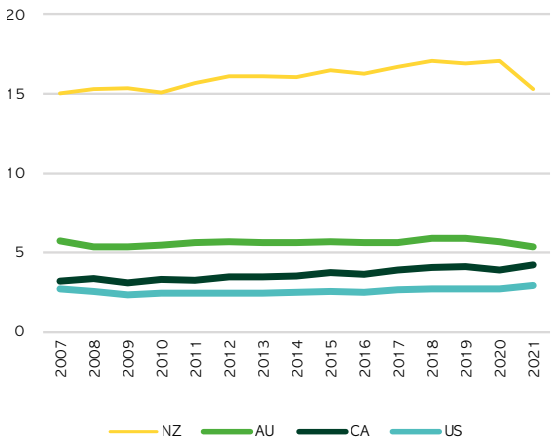
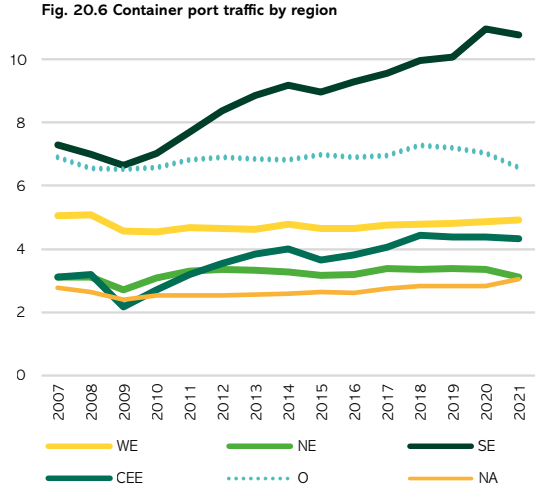


Fig. 20.6 Container port traffic by region



Source: Elaborated by authors based on OECD (2023)

Air freight transport

Air freight transport can be defined as any movement of goods using airplanes on airports. National air freight transport is defined as air traffic between two places located in the same country; international air freight transport involves traffic between a place in one country and a place in another country. This may involve transit through one or more additional countries. Following OECD (2023), a standard unit measure of air freight is Tonne-kilometre (abbreviated Ton-km), which represents a measure of freight transport of one tonne of goods by airplanes over a distance of one kilometre. To evaluate the performance of air freight transport, we estimate the number of tkm per one thousand units of the country GDP in constant dollars of 2015 (2015 USD). Thus, the unit of analysis is Ton-km/GDP USD 2015.[10]

Turning to the data on air freight transport in the countries under study, there were similarities between Western and Northern Europe. In Western Europe, the Netherlands are the leader, though it showed a modest decline through the period. Belgium leads the sub-group of all the other countries in the region, which were low, and either stable or in modest decline (Figure 21.2). In Northern Europe, similarly, there is a clear leader, this time, Iceland, which has also seen something of a decline overall during the period. Finland and Sweden show much lower levels than the leader, though Finland grew until COVID-19, whilst Sweden remained on a low level throughout (Figure 21.2).

In Southern Europe, the results overall as a group are lower than for Western and Northern Europe. In this context, Portugal is the regional leader, and has recovered since COVID-19. Spain and Italy are a second sub-group of countries, with Malta and Greece following them, with a slight downward trend in most cases (Figure 21.3).

In Central and Eastern Europe, air freight is generally at very low levels when compared to the other regions. In this group, Slovakia and Hungary started out with the most ambitious performance, but this soon slumped from 2009 onwards. Since then, Poland has emerged as the best performer, peaking before COVID-19 hit (Figure 21.4).

Finally, in Oceania and North America, New Zealand was the best performer at the outset of the period under study, but fell dramatically due to COVID-19 with no sign of recovery (Figure 21.5). The other members of this region exhibited low but constant levels, between 1 and 2.5 Ton-km/GDP USD 2015, throughout the whole period.

Comparing the regions, Western Europe shows the highest values, followed by Oceania and North America, however, all are on a downward trajectory across the period. Northern Europe grew for the first part of the period, but was negatively hit in 2020. Southern Europe follows, also negatively affected by COVID-19, whilst Central and Eastern Europe exhibit low and flat values (Figure 21.6).

[10] See OECD 2023 https://stats.oecd.org/Index.aspx?DataSetCode=ITF_INV-MTN_DATA and Eurostat 2023 https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Tonne-kilometre

Figures 21.1-21.6: Air freight transport in the countries under study, measured as Ton-km/GDP USD 2015

Fig. 21.1 Air freight in Western Europe

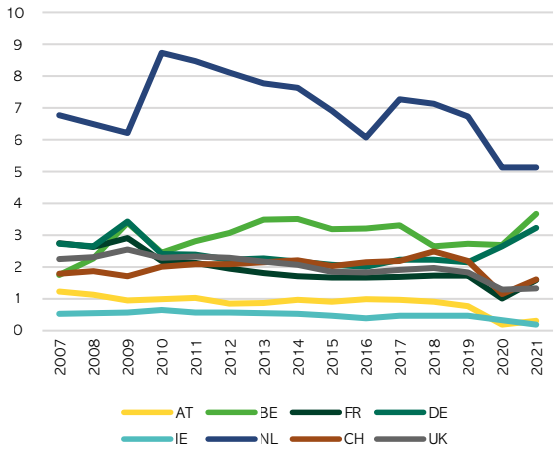


Fig. 21.2 Air freight in Northern Europe

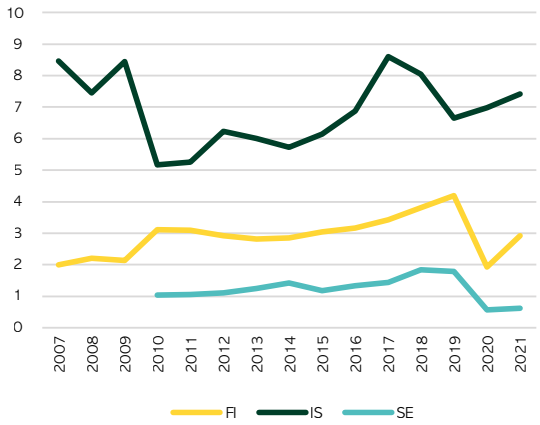


Fig. 21.3 Air freight in Southern Europe

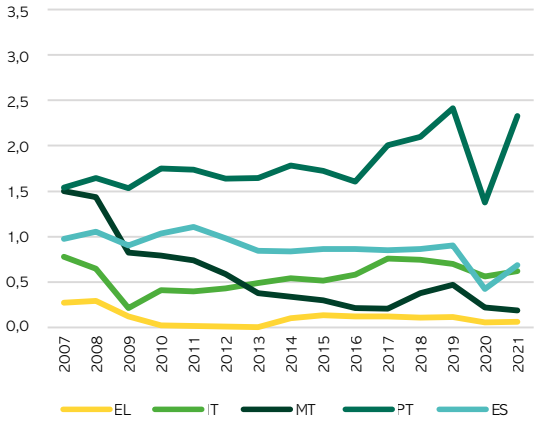


Fig. 21.4 Air freight in Central and Eastern Europe

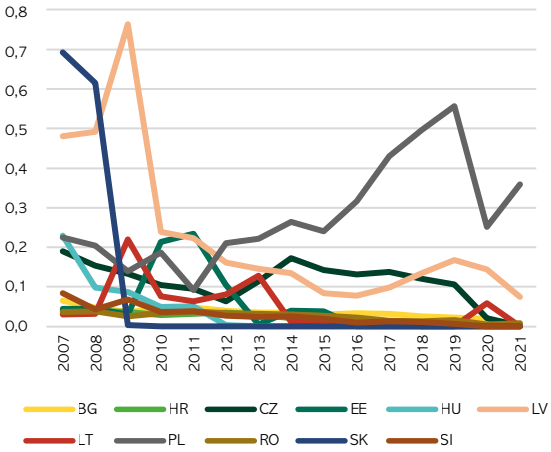


Fig. 21.5 Air freight in Oceania and North America

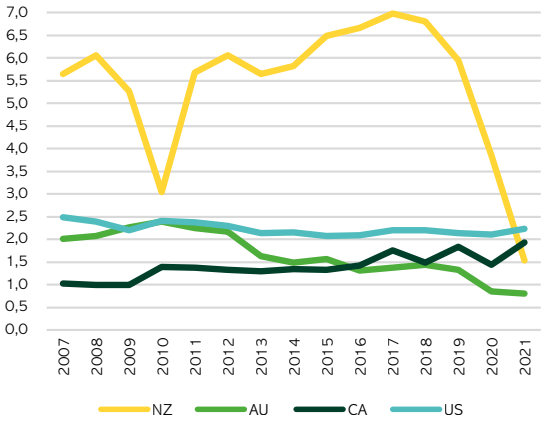
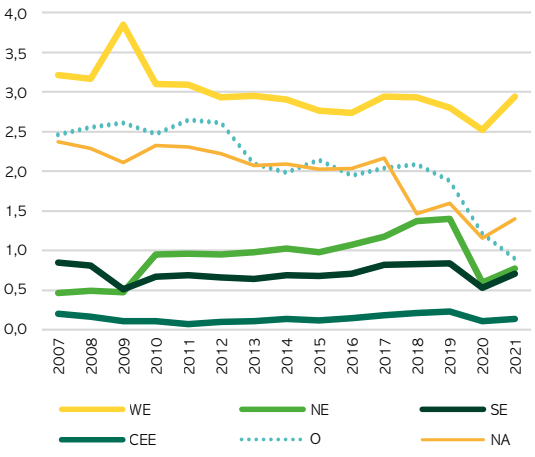


Fig. 21.6 Air freight by region



Source: Elaborated by the authors based on OECD (2023) and World Bank (2023)

Air passenger transport

Air passenger transport can be defined as any movement of passengers using airplanes and airports. Air passengers carried include both domestic and international aircraft passengers of air carriers registered in a country. To evaluate the performance of air passengers there are two main sources of information, on the one hand, the World Bank based on International Civil Aviation Organization (ICAO), which provides the number of passengers for most of the examined countries and, on the other, Eurostat, which provides the number of passenger-km for European countries, except for the UK. Thus, we estimate both indicators in terms of the GDP in constant dollars of 2015 (2015 USD). Given that there are two different approaches, in this chapter, we include consideration of both: first, we use the World Bank-ICAO definition, where the unit of analysis is measured as passengers/GDP USD 2015. Next, we use the Eurostat approach, showing passengers over a distance of one kilometre (passenger-km) in relation to GDP, hence this unit of analysis is passenger-km/USD 2015.

Before turning to examine the data on these two measurements, there are two important issues to point out. First, it should be clarified that since, in this case, there are significant outliers, this renders it complex to evaluate the rest of the data from the non-outlier countries. To resolve this, we present the data on all countries organised into their respective regions in the set of Figures 22.1a to Fig 22.4a, after which we exclude the outliers, and present the rest of the non-outlier countries in a second set of figures, Figures 22.1b to Figures 22.4b. The second important issue to bear in mind is that, in general, COVID-19 had a dramatic impact on passenger air transport, in particular, on international air transport. Airports that had a relatively large share of domestic transport tended to be somewhat less impacted than those that were more dependent on international flights.

Turning now to the data, in the case of Western Europe (Figure 22.1a), Ireland is the clear outlier, with very high levels of activity, that grow throughout the period until the year 2018, after which the values are flat until a steep drop is observed, coinciding with COVID-19. Considering trends in the rest of Western Europe, most countries saw increased values until COVID-19, with recovery starting in 2021 (Figure 22.1b). The Netherlands, Austria and the UK showed high values in this sub-group, and lower values could be found in Belgium and Luxembourg. The COVID-19 pandemic particularly affected Ireland and Austria and their main airport international passenger air transport. Dublin and Vienna airports dropped out of the top 10 top EU airports between 2019 and 2021 in terms of passengers carried (for more details, see EUROSAT 2022 Key figures on European transport).

In the case of Northern Europe, the outlier country is Iceland (Figure 22.2a). Similar to Ireland, Iceland saw values increase until 2018, flatten off but then decline sharply coinciding with COVID. As regards the other countries in this region (Figure 22.2b), Iceland performed strongly, followed by Sweden and Finland, all of which were sharply hit by COVID, with gradual recovery in 2021.

Most Southern European countries that are major tourist destinations had a high ratio of passenger-km/USD 2015, particularly, Malta, which is the outlier in this group (Figure 22.3a). Values peaked around 2009, after which they fall, starting to increase a couple of years before COVID-19, but then being hit hard from 2020. Looking at the other countries in this group (Figure 22.3b) all seem to follow a similar pattern as Malta, falling due to COVID-19, but showing some slow recovery. Palma de Mallorca, Athens and Lisbon airports were listed in the top 10 airports in Europe in 2021, but not in 2019. Italy, the country with the lowest values, does not exhibit recovery from 2021. Rome airports dropped out of the top 10 European airports between 2019 and 2021 (EUROSTAT, 2023).

In Central and Eastern Europe, the outlier countries are Hungary and Latvia (Figure 22.4a). In both cases, values increased steadily until 2020, after which they plummeted, with some gradual recovery in 2021. As regards the other countries in this region (Figure 22.4b), different patterns of performance can be observed but, as a general trend, all values were significantly lowered by the pandemic.

In the case of Oceania and North America, New Zealand exhibits the highest values, the other countries exhibiting very similar values, all members of this group are hard hit by COVID and show slow recovery in 2021 (Figure 22.5).

Across all regions, considering the averages, we can see that the outliers are not highly significant. Oceania has the overall strongest performance, and all regions are strongly impacted by COVID-19, and there is a generalised trend towards a slow recovery from 2021.

[11] See EUROSTAT 2022 Key figures on European transport).

Figures 22.1a- 22.6: Air transport passengers in the countries under study, measured by passenger-km/USD 2015 (Figures 22.1b, 22.2b, 22.3b and 22.4b exclude the outlier in each group)

Fig 22.1a Air passengers in Western Europe

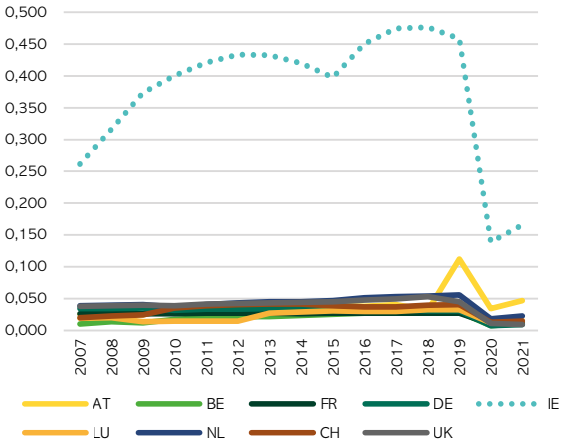


Fig 22.1b Air passengers in Western Europe

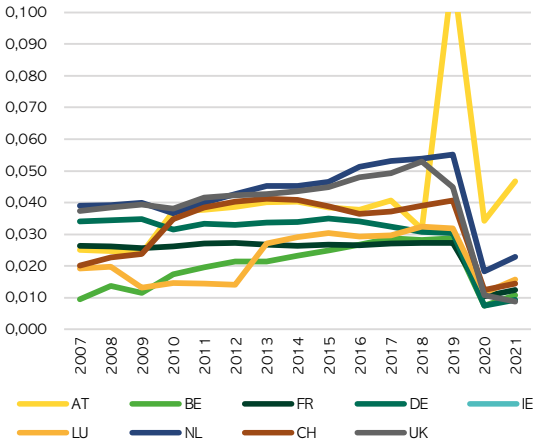


Fig 22.2a Air passenger in Northern Europe

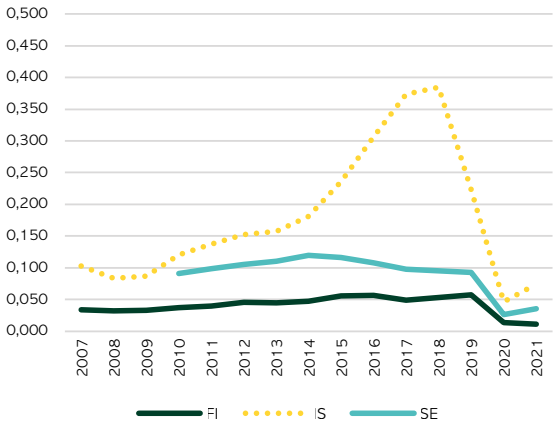


Fig 22.2b Air passenger in Northern Europe

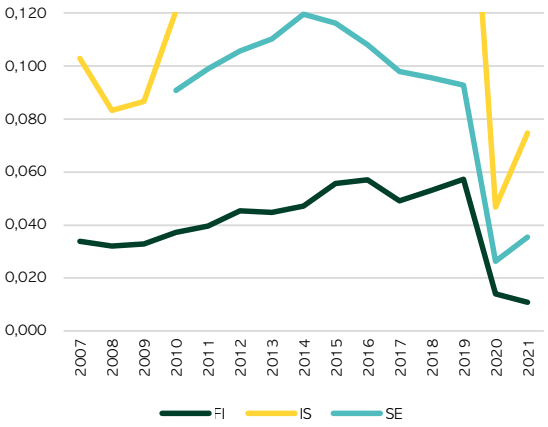


Fig 22.3a Air passenger in Southern Europe

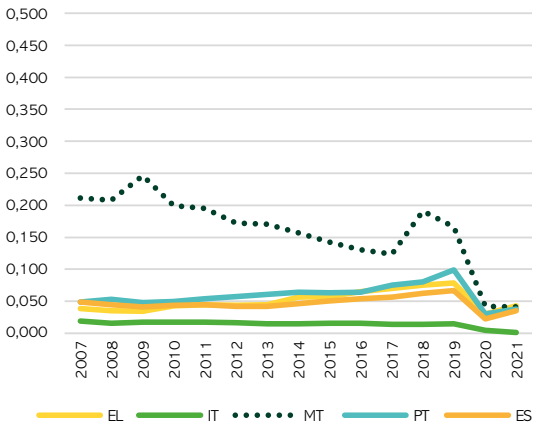


Fig 22.3b Air passenger in Southern Europe

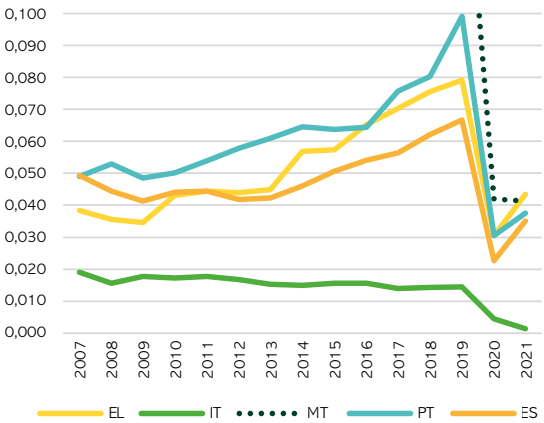


Fig. 22.4a Air passenger in Central & Eastern Europe

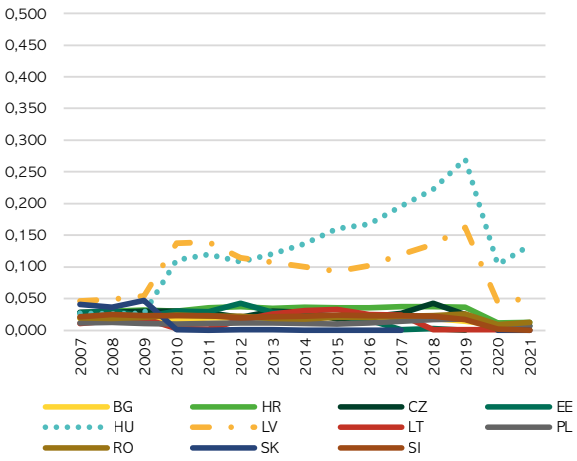


Fig 22.4b Air passenger in Central & Eastern Europe

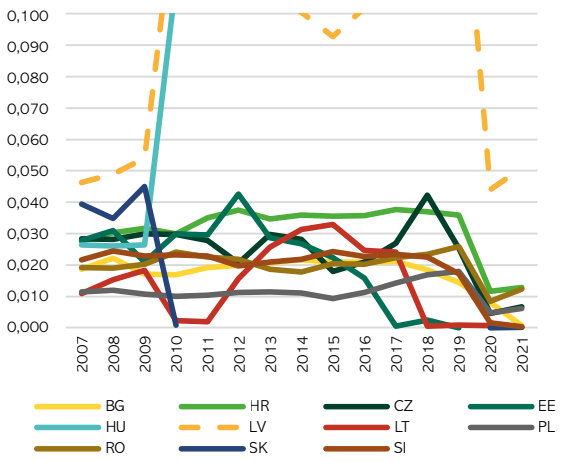


Fig 22.5 Air passenger in Oceania & North America

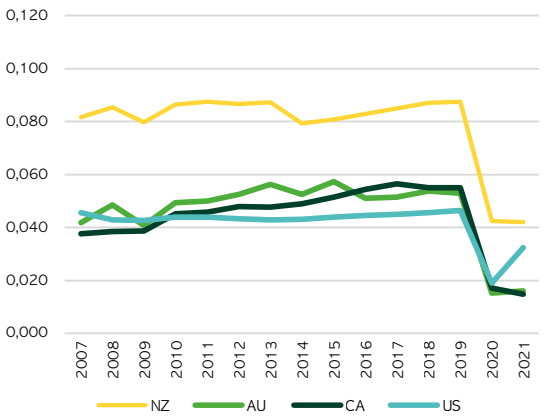
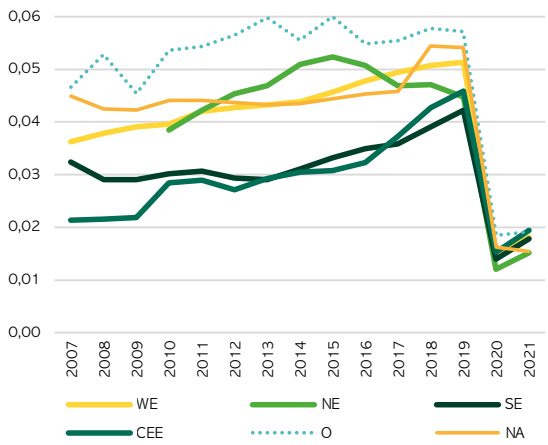


Fig 22.6 Air passengers per region



Source: Elaborated by the authors based on OECD (2023) and World Bank (2023)

The second approach to air passenger transport by Eurostat has the advantage of providing a more detailed unit of the measuring passenger-kilometre (passenger-km), which represents the transport of one passenger by air transport, in relation to the GDP 2015 USD. The unit of analysis is, therefore, passenger-km/GDP USD 2015.

Turning to the data on the countries under study, in Western Europe, France and Austria are the stronger performers, followed by Germany, showing modest increases until 2018, then the COVID slump (Figure 23.1).

In Northern Europe (Figure 23.2), Iceland is, by far, the strongest performer, peaking in 2018, flattening out and then falling sharply due to COVID-19 with some gradual recovery in 2021. The rest of the countries show quite similar results to each other, and recovery is lacklustre.

In Southern Europe, Greece was the strongest performer, followed by Cyprus, with Italy and Malta the lowest performers. Spain and Portugal exhibited very similar patterns (Figure 23.3).

In Central and Eastern Europe, leaders were Bulgaria and Croatia, Poland having the lowest value in this group. However, the negative effects of COVID-19 were common to all countries (Figure 23.4).

By European regions, Central and Eastern Europe was the strongest performer in terms of passenger-km per GDP, followed by Southern Europe, with Western and Northern Europe exhibiting similar results. All regions were negatively affected by COVID-19, and recovery was gradual in all cases in 2021, but strongest in the leader region (Figure 23.5).

Figures 23.1-23-5: Air passenger transport in the countries under study, measured by passenger-km/GDP USD 2015

Fig.23.1 Air passenger in Western Europe

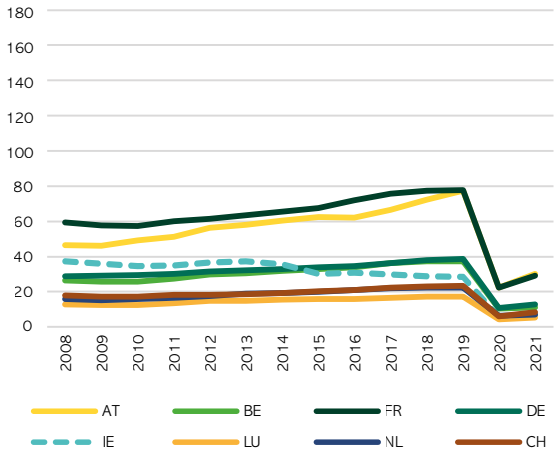


Fig. 23.2 Air passenger in Northern Europe

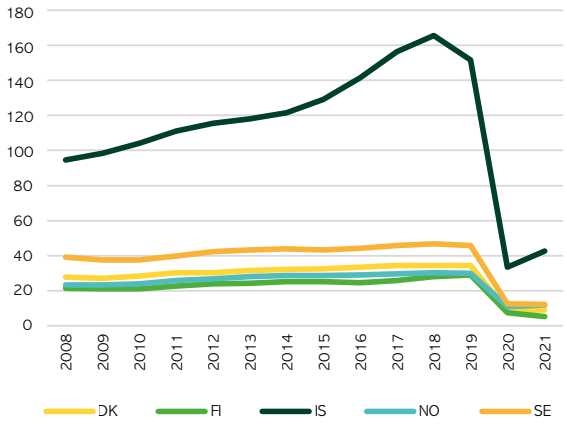


Fig 23.3 Air passenger in Southern Europe

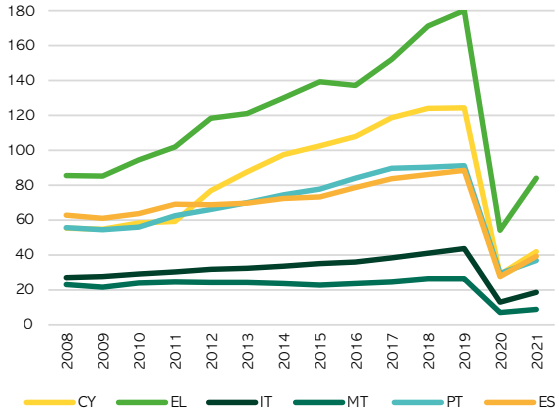


Fig. 23.4 Air passenger in Central & Eastern Europe

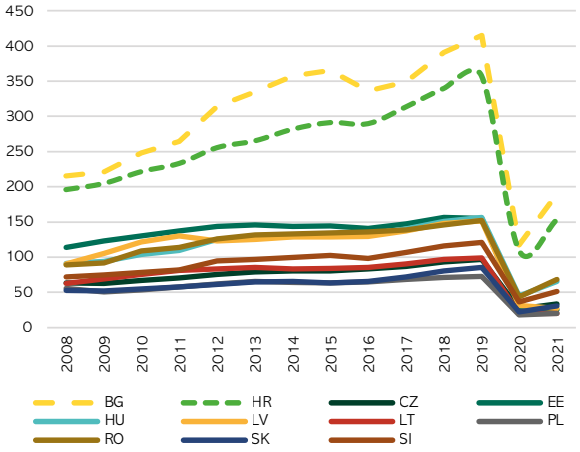
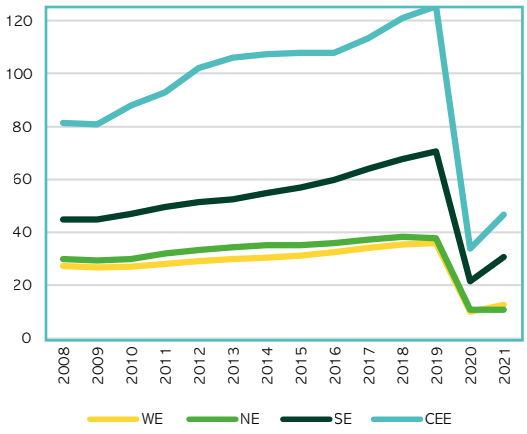


Fig. 23.5 Air passenger by region



Source: EUROSTAT (2023)

3.3.4. Satisfaction and trust

To examine the satisfaction with the transport systems in the examined countries in this chapter, we select the Logistic Performance Index (LPI). This indicator is elaborated by the World Bank as a tool created to help the countries assess the challenges and opportunities they face as regards their performance on transports logistics. The LPI allows for comparisons across all the considered countries in this study for the years: 2007, 2010, 2013, 2014, 2016, 2018 and 2023.

LPI overall scores the perceptions of international logistics professionals on the countries based on five components: transport infrastructure, shipment arrangements and prices international shipments, postal and air freight activities, ability to tracking and tracing, frequency and timeliness and efficiency of customs clearance process. For further details, see World Bank (2023) https://lpi.worldbank.org/about

Given that the LPI is not published annually, we present (Figures 24.1 to 24.6) columns for the surveyed years for the selected countries by regions.

In the Western Europe group (Figure 24.1), the strongest performers in the examined years were Germany, the Netherlands and Switzerland, and the weakest performers Ireland and Luxembourg. In the case of Luxembourg and the UK, the LPI deteriorated significantly from 2016 to 2022.

In Northern Europe (Figure 24.2), the weakest performer was Iceland across the whole period, however, this country did show noticeable improvement from 2016 to 2022.

In Southern Europe (Figure 24.3), the strongest performers were Italy and Spain in the whole period, and the most notable improvements can be found in Malta in 2022 after its mediocre results from 2007 to 2018. The LPI also improved in Greece from 2012 and Portugal from 2016. Cyprus was the weakest performer in this group and the LPI in 2022 was the lowest of the whole period.

All the Central and Eastern European countries improved their LPI from 2007 and 2022 (Figure 24.4). The strongest performers were Slovenia, Estonia, Latvia and Poland, and the weakest performers were Bulgaria, Hungary, Czechia and Romania.

In Australia and New Zealand (Figure 24.5), LPI improved in most of the examined years. This was also the case of Canada, that emerged as the strongest performer of the group in 2022. In contrast, the US displayed the highest LPI in 2007 but then saw a deterioration in its logistic performance from 2014 to 2022.

Figures 24.1-24.5: Logistics performance index (LPI): Quality of trade and transport-related infrastructure (1=low to 5=high)

Fig. 24.1Logistic performance in Western Europe

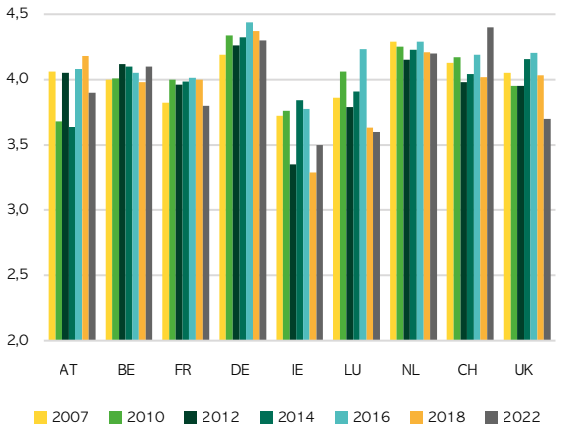


Fig. 24.2 Logistic performance in Northern Europe

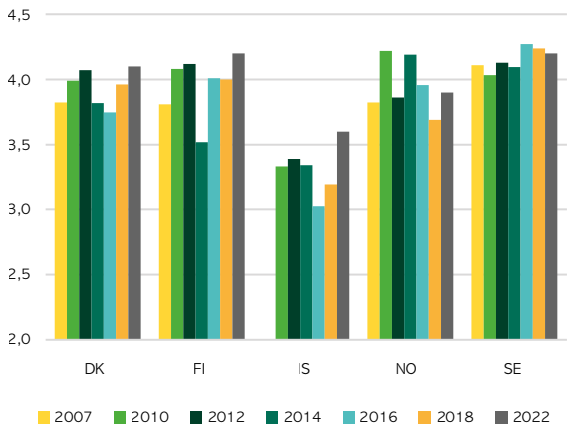


Fig. 24.3 Logistic performance in Southern Europe

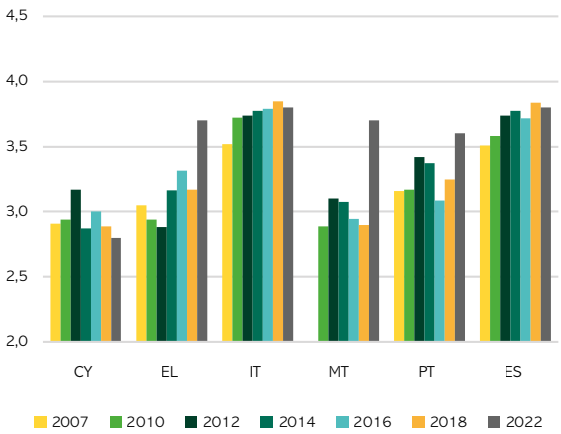


Fig. 24.4.1 Logistic performance in Central and Eastern Europe (1/2)

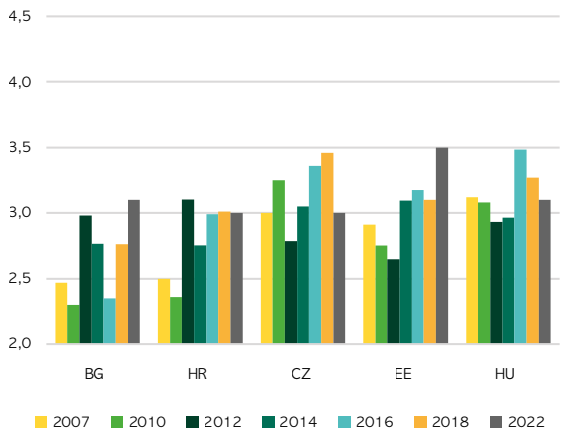


Fig. 24.4.2 Logistic performance in Central and Eastern Europe (2/2)

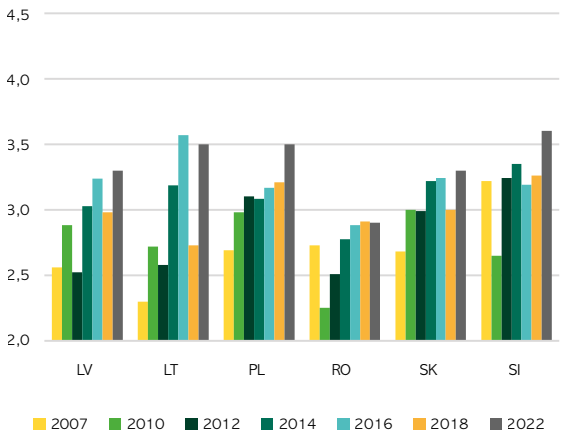
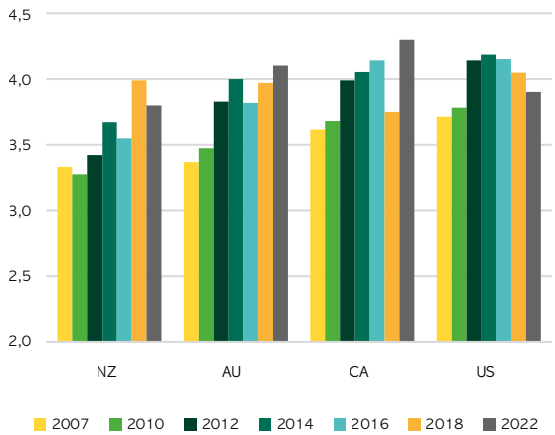


Fig. 24.5 Logistic Performance in Oceania & North America

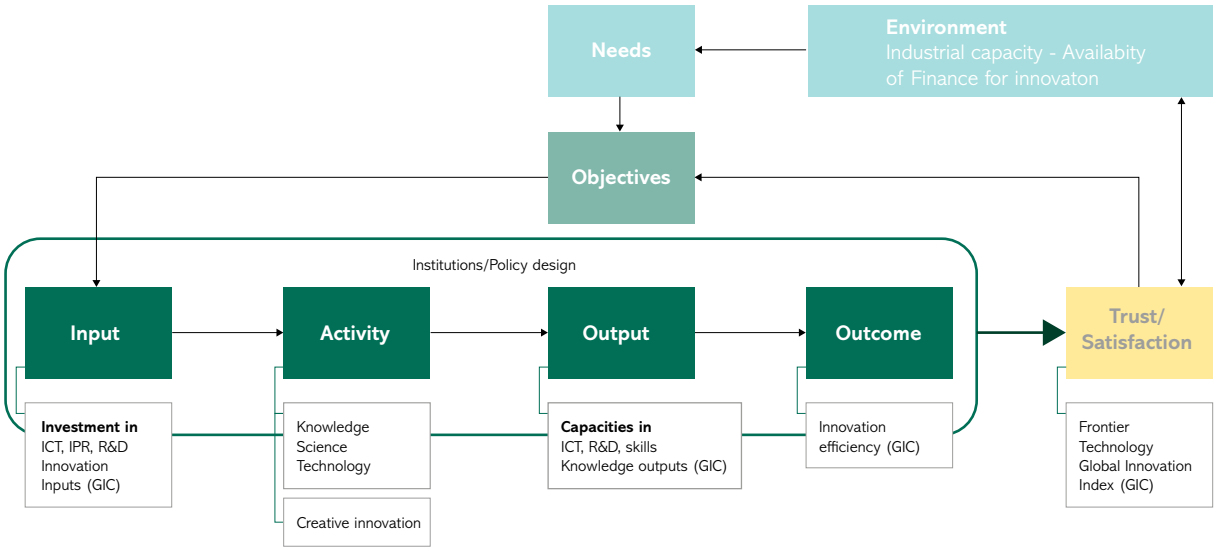


Source: Elaborated by authors based on World Bank (2023) https://lpi.worldbank.org/about

3.4. SCIENCE, TECHNOLOGY AND INNOVATION

Following the conceptual framework deployed by EIPA (2023) which was already adapted in this chapter to the Economy part, in this section, we tailor the framework to our study on Science, Technology and Innovation (see Diagram 3).

Diagram 3: The Conceptual framework for Science, Technology and Innovation



Firstly, we examine as inputs: Investment in ICT (Information and Communication Technologies which include R&D) and Investment in IPR (Intellectual Property Rights), both of these indicators have been elaborated based on OECD (2013), we also used as an input the GII (Global Innovation Index). This Input Index includes five enablers composite indicators of: Institutions, Human Capital & Research, Infrastructure, Market sophistication, and Business sophistication).

Secondly, we consider as outputs, on the one hand, three of the five components of the "Frontier technology readiness index" elaborated by UNCTAD (2023)[12]: ICT infrastructure, R&D and Skills capacities for using, adopting and adapting frontier technologies based on three of the five building blocks.

On the other hand, we have also used as an output of the GII, this "Output Index" includes two composite indicators, on the one hand, Knowledge which involved subcategories of Science and Technology (which was calculated in the GII since 2007), and, on the other hand, Creative Knowledge (which was estimated in the GII since 2010).

Third, we estimate the outcome based on an Innovation Efficiency ratio, which is the result of dividing the Output Global Innovation Index by the Input Global Innovation Index.

Finally, we consider two key indicators of Trust and Satisfaction. First, the Frontier technology readiness, which measures the capacity to use, adopt and adapt frontier technologies in: ICT deployment, skills, R&D activity, industry activity and access to finance for innovation, elaborated by UNCTAD and published in the Technology and Innovation Reports. Second, the GII, the Global Innovation project was launched by Soumitra Dutta in 2007. In 2013 WIPO (UN World Intellectual Property Organisation) began publishing the GII with an enhanced methodology, Cornell University joined as co-publisher, with Professor Dutta representing the GII at Cornell University. The GII information is open available in the WIPO.

[12] UNCTAD (2013) https://unctadstat.unctad.org/datacentre/dataviewer/US.FTRI) based on data on data from ITU, M-Lab, UNDP, ILO, Scopus, Patseer, World Bank and UNCTAD

3.4.1. Inputs

In terms of inputs we first consider two key categories: Investment in ICT as percentage of GDP in Figure 25.1 to 25.5, and Investment in IPR as percentage of GDD in Figure 26.1 to 26.6, both of them have been estimated based on information from OECD (2013). We also used as a composite innovation input the GII (Global Innovation Index) published by INSEAD for the years between 2007 and 2012 and WIPO from 2013 onwards.

Investment dynamics can be examined following classification by main assets. In this section, we use the two major categories of investment by assets that are key for Science, Technology and Innovation. These are Information and Communication Technologies (ICT) and Intellectual Property Rights (IPR).

Information and Communication Technology (ICT) equipment (including computer software and databases, telecommunications equipment and computer hardware) is considered the key investment for the digitalization of the economic activity. ICT assets on total GFCA accounted for some 11.5% on average from 2007 to 2021 in the countries considered in this chapter. The highest share of ICT investment on total GFCF was in Sweden (19.4%), followed by the Netherlands and Switzerland (both at 17.3%). In contrast, the lowest levels were in Poland (4.7%) and Hungary (6.8%).

Intellectual property products (such as R&D, mineral exploration, software and databases, and literary and artistic originals, etc.) are investments related to innovation in economic productive activity. This category accounted for some 17.2% on total GFCF on average between 2007 and 2021 in the countries under consideration. Important differences were observed among countries which are indicative of the innovative effort, with the highest shares identified in Ireland (41.2%), followed by Switzerland (31.7%) and Sweden (27.5%) and the lowest in Latvia (7%) and Poland (7.2%).

ICT Investment
In Western Europe, Switzerland was the strongest performer, with ICT investment increasing over the period from 4.5% to over 5%. A second sub-group of countries also witnessed good increases. For example, France followed with a significant increase, from less than 3% to over 4.2%, the Netherlands from 3.3% to nearly 3.8%, and Austria from under 3% to nearly 4% all in the same period. Intermediate performers included Belgium and the UK, which hovered between 2.5% and 3% during these years. Low performers included Germany, Ireland and Luxembourg, all flat during the period, between the 1% and 2% level (Figure 25.1).

In North Europe, ICT investment was strong. The best performer by far was Sweden, starting at 5% in 2007 and, after some decline, improving to 5.2% by the end of the period. Denmark and Norway also saw improvements, from 2.7 and around 2% to 3.1% and nearly 2.5% during the period (Figure 25.2).

In Southern Europe, most countries saw quite flat ICT investment levels, with Spain, Portugal and Italy seeing a small increase over the period. Italy and Portugal were the best performers in this group, increasing from 2% and 2.2% respectively in 2007 to 2.2% and nearly 2.5% by 2021. Cyprus trailed at the bottom of this group, seeing an overall decline from less than 1% in 2007 to 0.5% by 2021. Greece also saw a small decline in this investment category until 2015 (Figure 25.3).

In Central and Eastern Europe, we witness a diversity of investment patterns in ICT. The strongest performer is Estonia, which starts in 2007 with an average ratio for this group, but sees investment soar to over 6% by 2021. The Czech Republic is the second best performer, increasing from around 3.5% to 5% during the same period. The worst performer is Bulgaria, whose ICT investment slumps from 2% in 2007 to 0.2% by 2015, then stagnates around 0.1% towards the end of the period. The rest of the members of this group are intermediate ICT investors, maintaining a quite steady ratio of between 1% and 2% during the period (Figure 25.4).

In Oceania and North America, we can see different investment patterns. First, the US is the best performer, exhibiting quite stable ICT investment which increases during the period from just over 3% to just under 4%. In Canada, ICT investment is somewhat lower, starting at 2.6% and ending at around 2.5% by the end of the period. In Australia, ICT investment falls from 2.6% in 2007 to under 1.8% by the end of the period. In New Zealand ICT investment increases to nearly 4% in 2015 – after which there is no data. (Figure 25.5).

By region, investment in ICT was overall strongest in North America, which saw growth in the period, from around 3% in 2007 to 3.6% by 2021. North Europe followed, also with some growth overall, from 3.1% to 3.4% in the same period. Behind this region was Western Europe, which grew from around 2.3% to just over 2.6%. Southern Europe and Central and Eastern Europe both lagged behind in 2007, with levels of around 2% in 2007. Whereas in Southern Europe there was a slight increase, to 2.15% by 2021, in Central and Eastern Europe this actually fell, to 1.7% by 2021. Oceania also saw a decline, from 2.8% in 2007 to around 2.2% by 2015 (Figure 25.6).

Figures 25.1-25.6: Investment in ICT in the countries and regions under study, measured as a percentage of GDP

Fig. 25.1 Investment in ICT in Western Europe

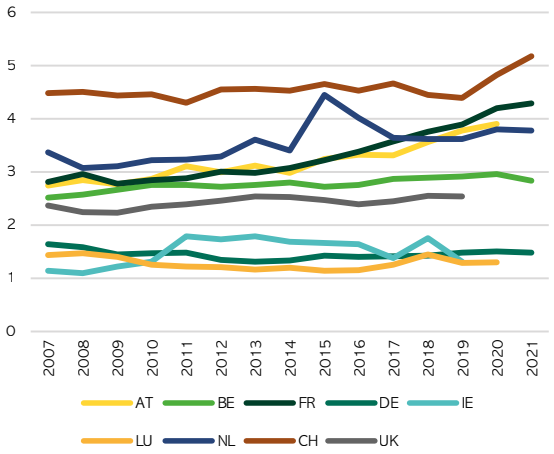


Fig. 25.2 Investment in ICT in Northern Europe

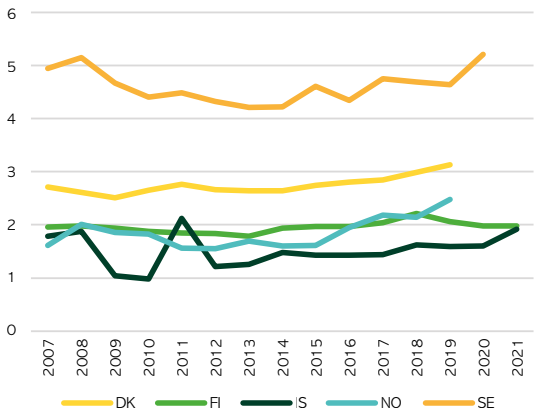


Fig. 26.3 Investment in ICT in Southern Europe

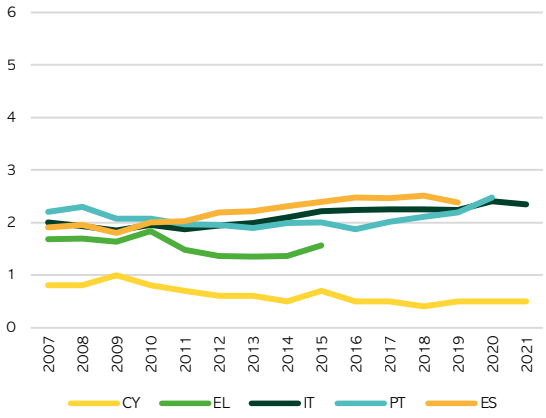


Fig. 26.4 Investment in ICT in Central and Eastern Europe

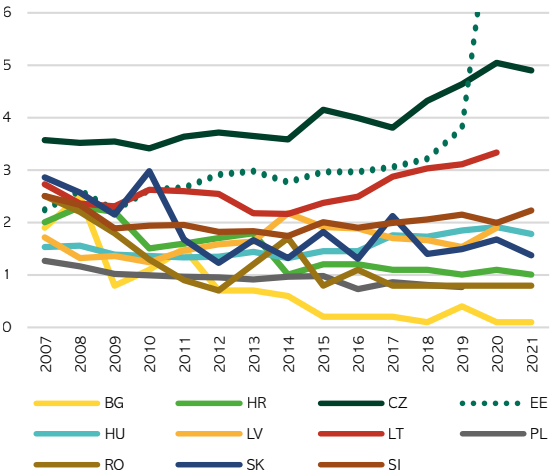


Fig. 26.5 Investment in ICT in Oceania and North America

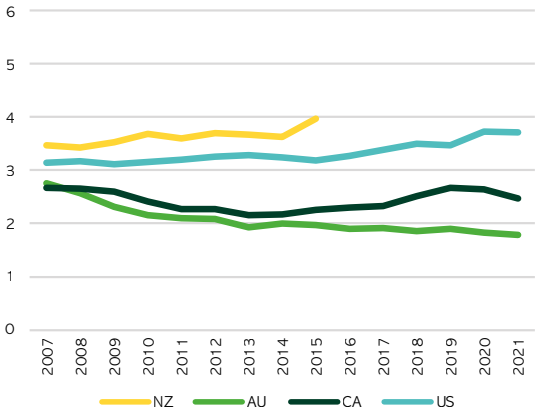
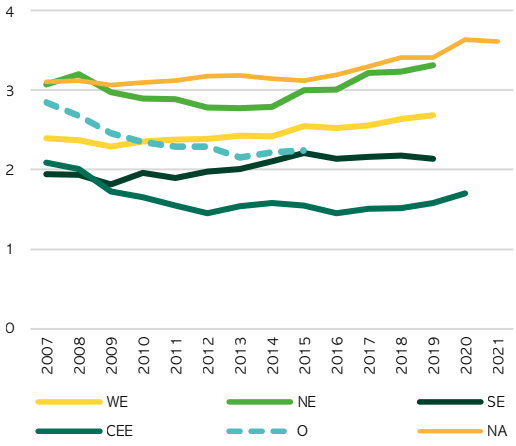


Fig. 12.6 Investment in iCT by region (% GDP)



Sources: OECD (2023) and EUROSTAT (2023)

IPR Investment

In Western Europe, IPR investment was strong overall, with large diversity within the grouping. Two countries were the strongest performers: Ireland and Switzerland. In the case of Ireland, IPR investment shot up dramatically from 2014 to levels over 10%. For Switzerland, IPR investment increased more steadily, from over 7% to over 10% during this time. By far the lowest performer was Luxembourg, which increased from a low of 1% in 2007 to around 1.5% by 2021. The rest of the countries in this grouping saw overall but slight increases, from levels between a low of 3% and a high of 5.5% in 2007 to 2021. Of this intermediate grouping, the UK was the lowest performer (Figure 26.1).

In Northern Europe there was again some diversity. Sweden and Denmark were the strongest performers, with ratios increasing from 6.3% to 7.3% in the case of Sweden and 4.6% to 5.5% in the case of Denmark, in the period 2007 to 2021. The lowest performer of this group was Iceland; however, this country did see improvement, from over 2% in 2007 to just over 3% by 2021 (Figure 26.2).

For Southern Europe, Malta was the best performer, with a significant increase in ICT investment from 2017, taking its ratio up to over 5% by 2021. Apart from Malta, however, the rest of the countries in this grouping saw more moderate increases, a group led in this case by Spain, which saw an increase from 2.4% in 2007 to over 3.5% by 2021. The weakest performer was Greece, however, again, it did see an increase in this investment type, from around 2% to nearly 2.5% in the period (Figure 26.3).

In Central and Eastern Europe, diversity is apparent with two leader performances from Estonia and Czech Republic. Estonia´s ICT investment grows more steadily, from over 3% to over 5% during the period, whilst that of the Czech Republic shoots up dramatically from 2019 to over 7%. The remaining countries in this grouping see much more moderate increases during the period. In 2007, the low is 1.3% and the high just over 3%: by the end of the period, the low is nearly 1.5% and the high over 3.2% (Figure 26.4).

For Oceania and North America, the pattern is clear with the US domination in this investment type. US ICT investment increases from 5% to nearly 6.5% between 2007 and 2021. The other members of this grouping exhibit a relatively similar pattern. Led by New Zealand, whose ratio increases from less than 3% to 3.6% during this period, investment hovers around the 3% mark throughout. The worst performer of this grouping is Australia, where investment falls somewhat, from over 3% to 2.6% (Figure 26.5).

By region, there are two clear sets of patterns as regards IPR investment. Led by North America, the stronger group also includes Western and Northern Europe. All three of these groups saw significant increases during the period under study. The lower performers in this category are Central and Eastern Europe, Southern Europe and Oceania. Of this latter group, only Oceania saw levels from 2007 fall further, the other two groups witnessed some growth in levels (Figure 26.6).

Figures 26.1-26.6: Investment in Intellectual Property Rights (IPR) in the countries under study, measured as a percentage of GDP

Fig 26.1 Investment in IPR in Western Europe

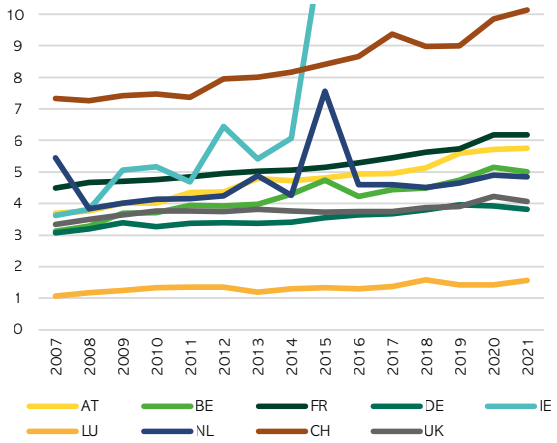


Fig. 26.2 Investment in IPR in Northern Europe

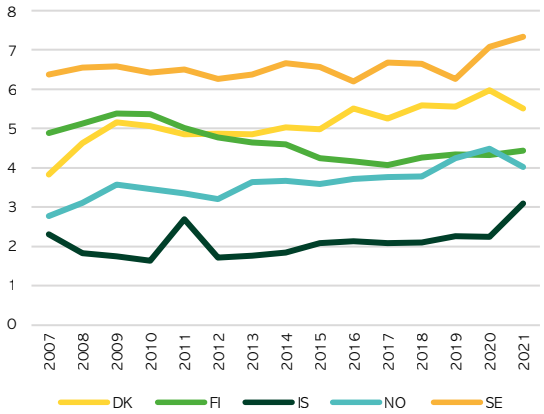


Fig. 26.3 Investment in IPR in Southern Europe

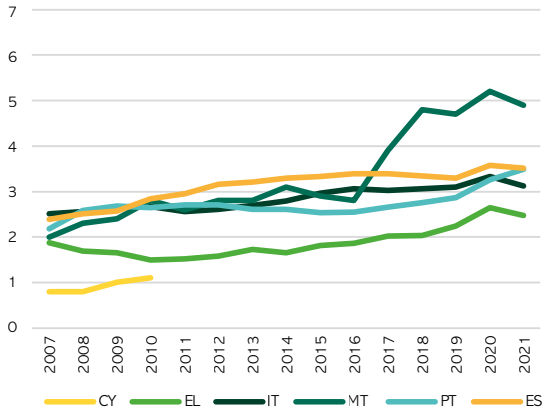


Fig. 26.4 Investment in IPR in Central and Eastern Europe

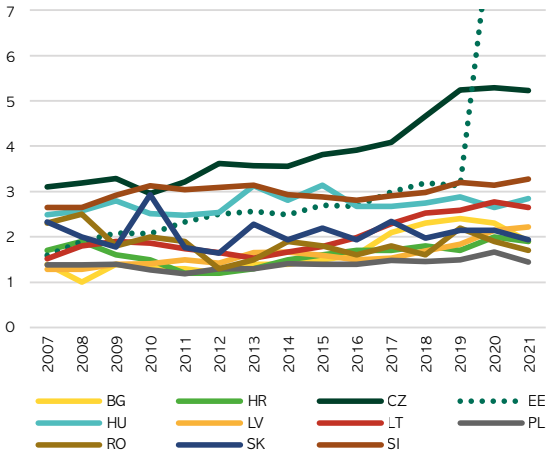


Fig. 26.5 Investment in IPR Oceania and North America

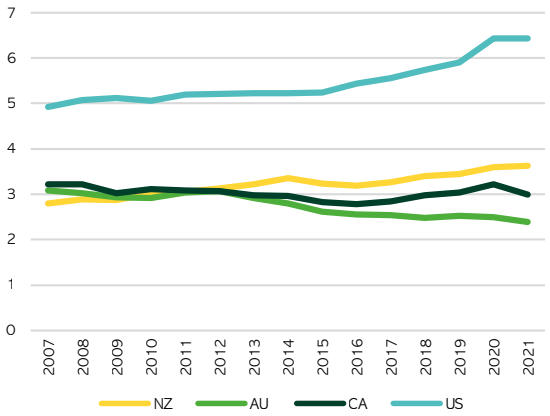
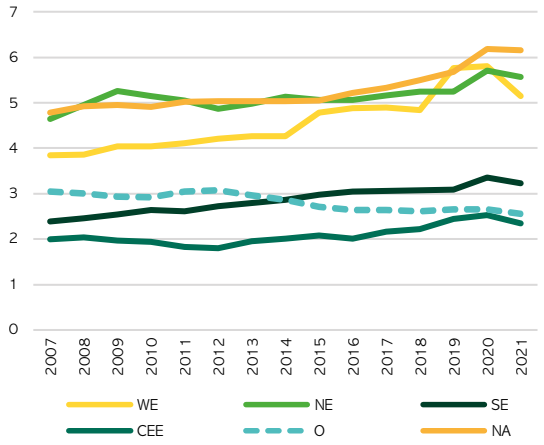


Fig 26.6 Investment in IPR by region



Sources: OECD (2023) and EUROSTAT (2023)

Innovation Inputs (Global Innovation Index – WIPO)
When we consider the composite Innovation Input Index of the GII (Global Innovation Index), which includes multiple indicators in five blocks: Institutions (which includes: Political environment, Regulatory environment and Business environment), Human Capital & Research (including: Education, Tertiary education, and R&D), Infrastructure (ICTs, General infrastructure, Ecological sustainability), Market sophistication (including Credit Investment Trade, competition, and market scale), and Business sophistication (Knowledge workers Innovation linkages and Knowledge absorption). The collected "Innovation Inputs" is based on information produced for the GII by INSEAD from 2007 to 2012, but in particular for the information provided for the GII by WIPO (2023) since 2013.
https://www.wipo.int/global_innovation_index/en/2023/

In Western Europe the top performer is Switzerland, while United Kingdom is in a declining trend since 2013, the Netherlands and Germany are in a rising trend, on the other extreme Ireland and Luxembourg started in top position in 2011 and gradually became the poorest performers.

In the North European group all the members are constantly top performers, a trend that corresponds with those of previous inputs in terms of investment for ICT and IPR.

The Southern European shows a positive trend until 2019, with Spain as top performer and Greece and Malta at the bottom but in an accelerated catch up.

The Central and Eastern European countries showed a gradual improvement along the whole period with Slovenia, Estonia and Czechia as top performers and Bulgaria, Hungary, Romania and Slovakia as the weak performers.

In case of Australia and Oceania the innovation inputs score is regularly at an average level and with a slight decline since 2018, in the case of North America the US is clearly a top leader at the levels of Switzerland, Sweden and Denmark in Europe, and Canada is also a high intermediate performer similar to the Netherlands and Finland.

In general, the trends of the aggregated Innovation Index by countries and regions correspond with the previous trends of investment in ICT and IPR as percentage of GDP by country and region.

Figures 27.1-27.6: Innovation Inputs Scores in the countries and regions under study, measured as a score (min 0 and max 100)

Fig. 27.1 Innovation Inputs in Western Europe

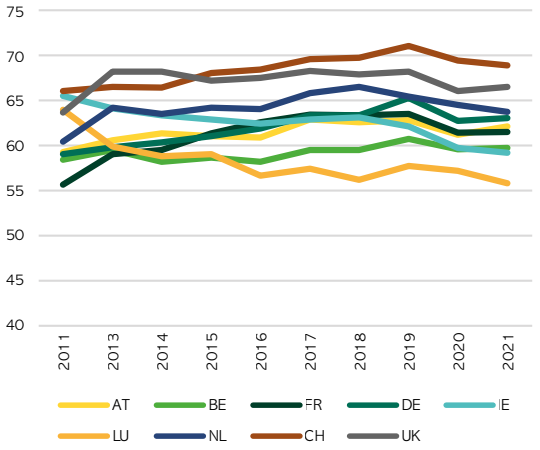


Fig. 27.2 Innovation Inputs in Northern Europe

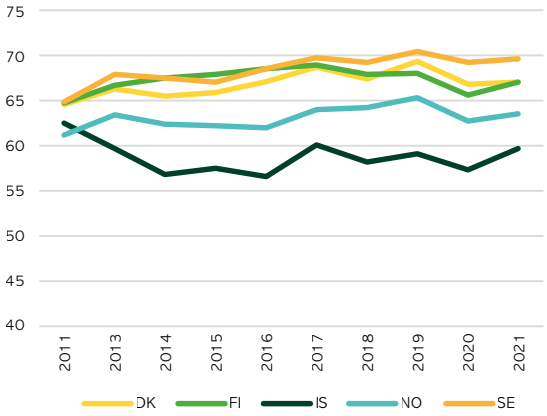


Fig. 27.3 Innovation Inputs in Southern Europe

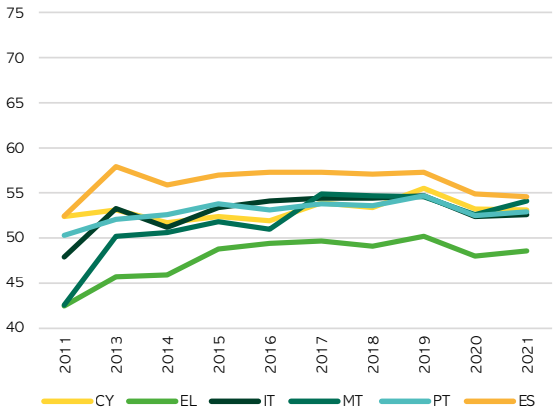


Fig. 27.4 Innovation Inputs in Central and Eastern Europe

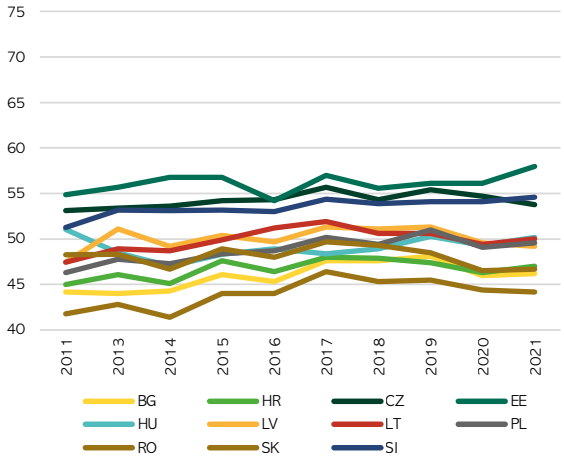


Fig. 27.5 Innovation Inputs in Oceania and North America

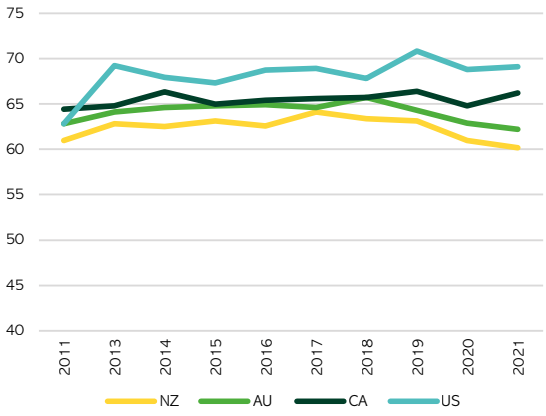
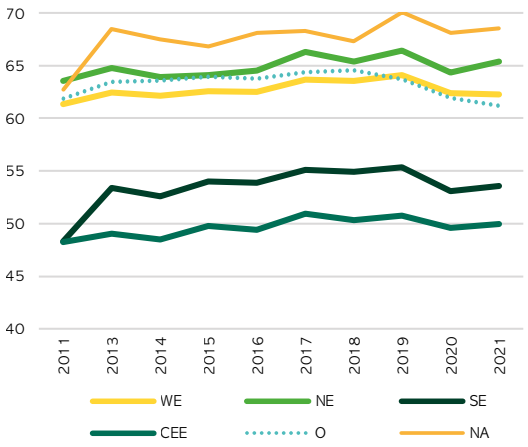


Fig. 27.6 Innovation Inputs by regions



Source: WIP (2008-2023) Global Innovation Index, https://www.wipo.int/global_innovation_index/en/

3.4.2. Outputs

In this section we examine two groups of output indicators. On the one hand, three of the five building blocks of the UNCTAD (2023): "Frontier technology readiness index". These three outputs are technological capacities related to ICT infrastructure, R&D capacity, and human capital in terms of skill capacities to use, adopt and adapt these technologies "frontier technologies". On the other hand, we will consider a fourth aggregated output that is the composite Innovation Outputs index published by WIPO (2023).

ICT infrastructure for using, adopting and adapting frontier technologies.
UNCTAD (2023) measure the level of ICT infrastructure. Using, adopting and adapting frontier technologies requires sufficient ICT infrastructure, especially since disruptive technologies (AI, Internet of Things, Big Data and Blockchain) are internet-based technologies. Two aspects of ICT infrastructure need to be considered: the prevalence to ensure that everyone has access and that no one is left behind; and the quality of infrastructure that allows for more advanced and efficient use. For these purposes, internet users as a percentage of the population captures the prevalence of internet infrastructure, while the mean download speed measures the quality of internet connection.

In general, all the countries and regions have noticed positive trends in terms of ICT infrastructure. The values are near the maximum in all the countries, in Western Europe all countries were between 0.8 and 0.9 in 2021, Luxembourg, the Netherlands and Switzerland with values over 0.9 in previous years), in Northern Europe all countries were between 0.8 and 1 in 2021 (most of the with better results in previous years). In Southern Europe the national indexes were between 0.8 and 0.9 in 2021 with a much more accelerated catch up since 2015 and no reversal in recent years. The convergence in the indexes have been also accelerated in Central and Eastern Europe, the indexes were between 0.7 and 0.9 in all countries. Similar trend can be also observed in Australia with an index of 0.8 in from 2018 to 2021 and New Zealand, Canada and the United States of 0.9 from 2018 to 2021.

Figures 28.1-28.6: ICT infrastructure for using, adopting and adapting frontier technologies. (Index 0 to 1) 2008-2021

Fig. 28.1 ICT infrastructure for frontier technologies in Western Europe

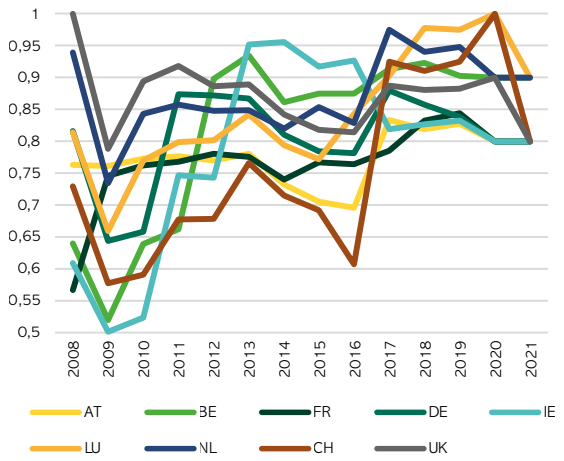


Fig. 28.2 ICT infrastructure for frontier technologies in Northern Europe

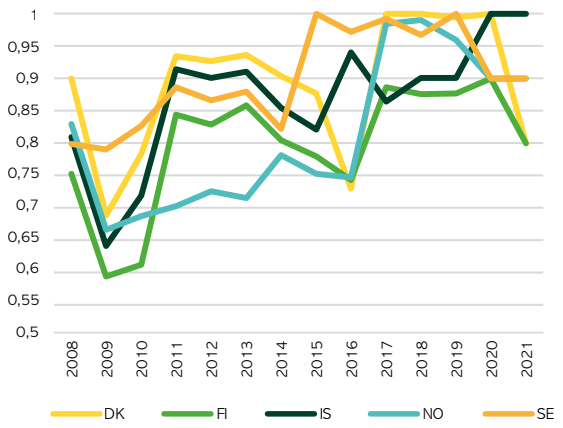


Fig. 28.3 ICT infrastructure for frontier technologies in Southern Europe

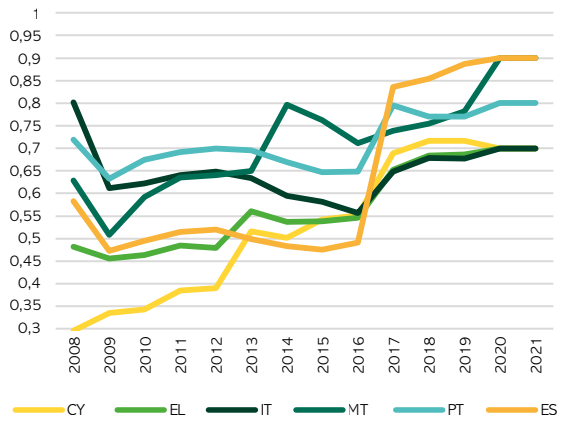


Fig. 28.4 ICT infrastructure for frontier technologies in Central and Eastern Europe

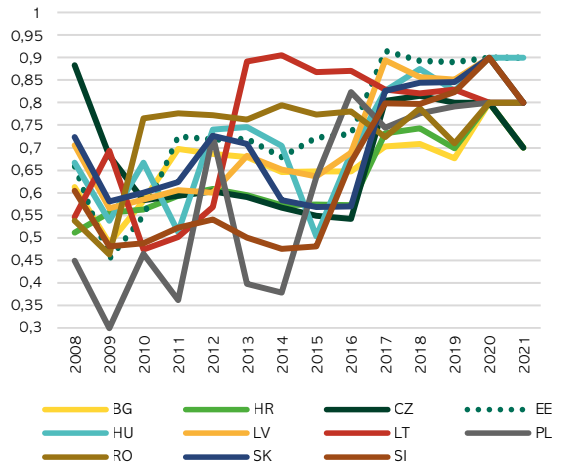


Fig. 28.5 ICT infrastructure for frontier technologies in Oceania and North America

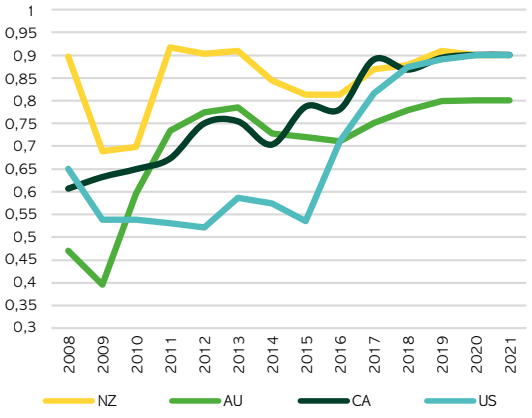
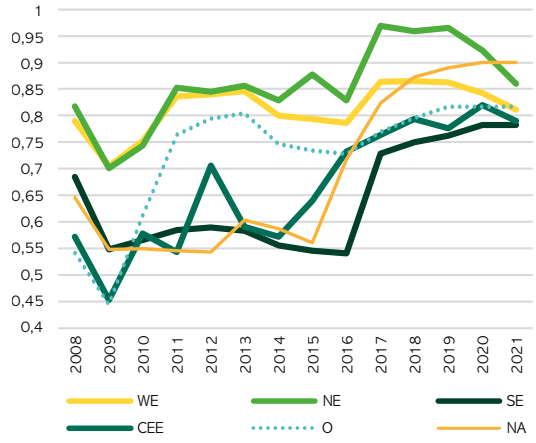


Fig. 28.6 ICT infrastructure for frontier technologies by regions



Source: UNCTAD (2023)

R&D capacity for using, adopting and adapting frontier technologies.
R&D activity is needed not just for the production of frontier technologies, but also for adoption and adaptation, as these technologies often require adjustment or modification for local use. R&D activity is an output resulting from the R&D investment examined in the previous section. R&D capacity is measured using the number of publications and patents filed on the 11 frontier technologies in a country. The publication and patent search queries used are the same as shown in the UNCTAD Technology and Innovation Report 2021.

The R&D activities in the Western European countries show significant differences, with Germany, France and United Kingdom on as top performers but in a declining trend (Figure 29.1). On the other hand, the smaller countries such as Luxembourg and Ireland are at the bottom of performers but in a rising trend towards the average.

In Northern Europe the R&D capacities are more regularly at a high level in Sweden, Denmark, Finland and Norway, but much lower and stable in the case of Iceland (200.2).

In Southern Europe, Italy and Spain are stable high performers at a similar level to that of key Western and North European countries. The smaller countries such as Malta and Cyprus are also at the bottom of the performers but in a rising trend.

The Central and Eastern European countries are, in general, poor performers in R&D capacity but also show a convergent trend to the low intermediate level.

In Oceania, Australia has a medium-high and New Zealand a low R&D capacity for frontier technologies. Finally, the United States has been until 2019 at the top of the R&D capacity, with a drastic decline in the last two years, and Canada has been stable on a medium-high level in the whole period.

Figures 29.1-29.6: R&D capacity for using, adopting and adapting frontier technologies. (Index 0 to 1) 2008-2021

Fig. 29.1 R&D capacity in Western Europe

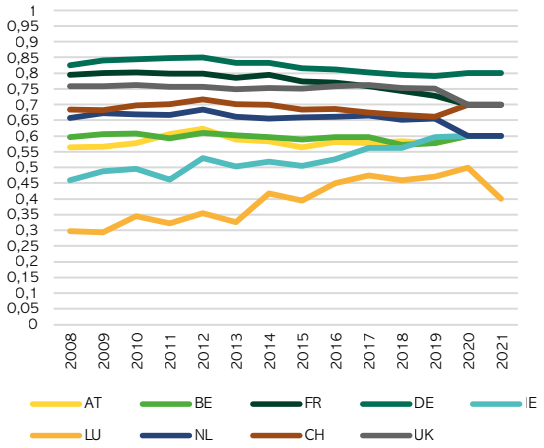


Fig. 29.2 R&D capacity in Northern Europe

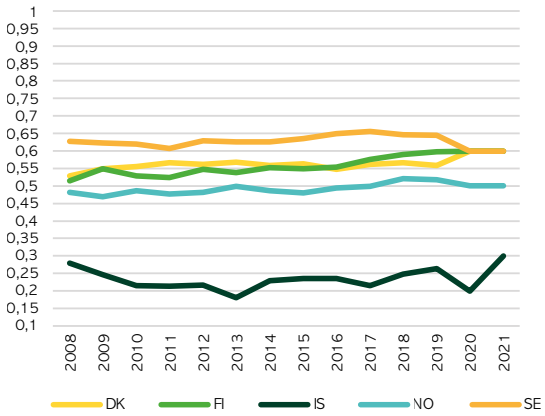


Fig. 29.3 Index of R&D capacity in Southern Europe

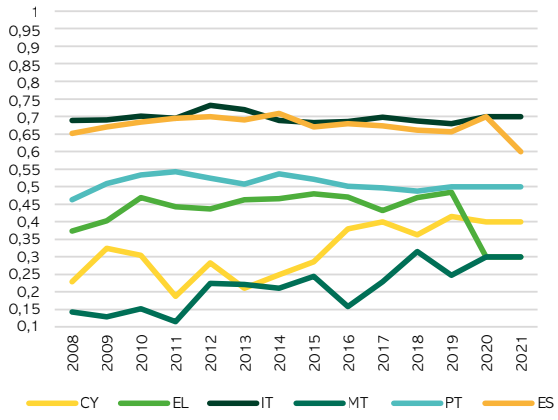


Fig. 29.4 Index of R&D capacity in Central and Eastern Europe

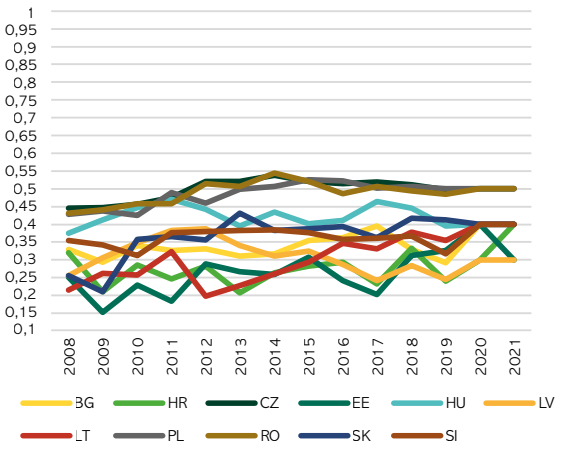


Fig. 29.5 R&D capacity in Oceania and North America

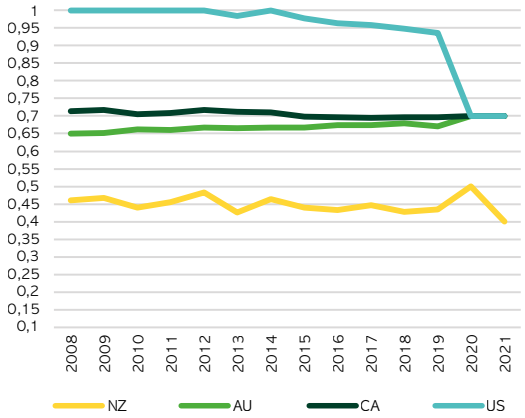
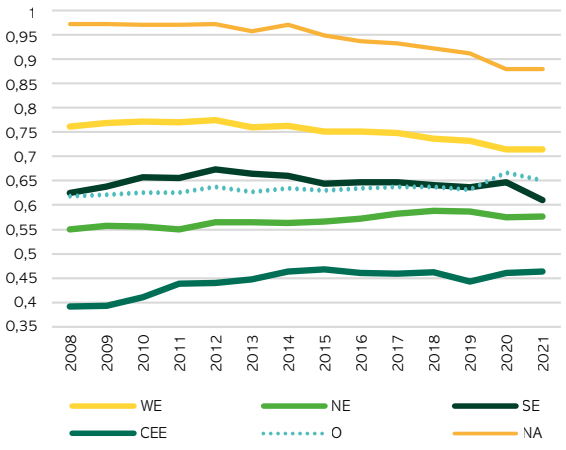


Fig. 29.6 R&D capacity by region



Source: UNCTAD (2023)

Skill capacity for using, adopting and adapting frontier technologies.
Using, adopting and adapting frontier technologies needs people equipped with relevant skills. These skills may be advanced but are generally lower than those required to originate the technologies. Two types of skills need to be considered: skills acquired through education, and skills acquired in the workplace through practical training or learning-by-doing. The overall educational attainment of the population is measured through expected years of schooling, while the skill level in the labour market is measured by the extent of high-skill employment – defined by the ILO as the sum of managers, professionals and technicians and associate professionals following the International Standard Classification of Occupations (ISCO).

All the examined countries show a general declining trend in terms of Skill capacities for frontier technologies.

In Western Europe the top performers have been Belgium, that declined from 1 in 2008 to 9 in 2021, and the Netherlands, that kept a relative value around 0.0 in the whole period, the poorest performance took place in Austria and France.

In the Northern European countries, the trends have been more stable from 2008 to 2016, with a drastic decline in 2017 and a partial recovery until 2021. All countries reached the same index in 2021 equivalent to the best performers in Western Europe in the same year.

The trends in skill capacities for frontier technologies have been smoother in Southern Europe than the rest of the regions, the decline was less drastic between 2016 and 2017 and in 2021 all the countries, except Cyprus, reached the same index: 0.7

In Central and Eastern Europe there was a high level of variability and difference among countries. On the one hand, Slovenia was a top performer that started and finished with a high level of skills (0.85 in 2008 and 0.8 in 2021), in comparison with the other countries from the region. On the other hand, Romania started and finished at a lower level (0.58 in 2008 and 0.5 in 2021). However, the rest of the countries finished in 2021 with an index between 0.6 and 0.7.

The declining trends in skills for frontier technologies have been also dramatic in the United States and Canada, the only exception in the whole group of examined countries has been Australia that maintained the maximum index around 1 during the whole period.

These trends in indexes of Skill capacities for frontier technology contrast with those observed in ICT infrastructure and R&D capacity and put in evidence the complexity of the Science and Technology systems.

Figures 30.1-30.6: Index of Skill capacity for using, adopting and adapting frontier technologies. (Index 0 to 1) 2008-2021

Fig. 30.1 Skills for frontier technologies in Western Europe

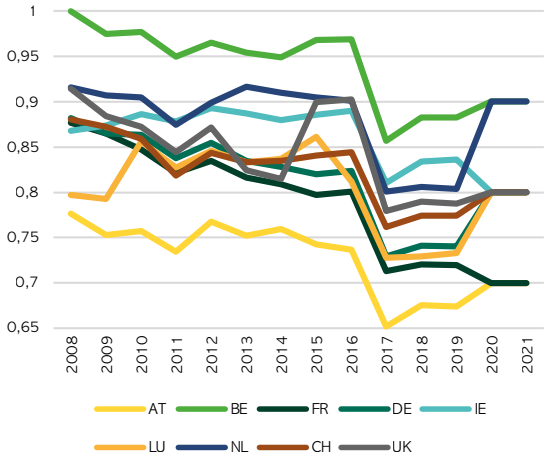


Fig. 30.2 Skills for frontier technologies in Northern Europe

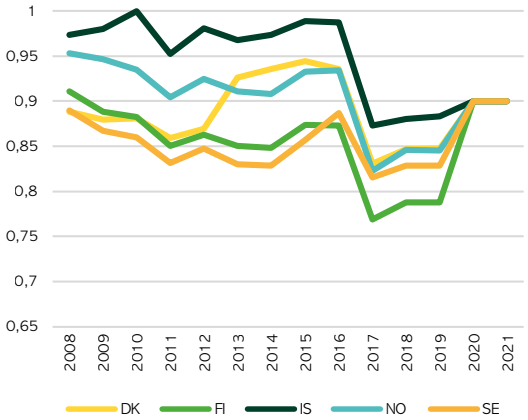


Fig. 30.3 Skills for frontier technologies in Southern Europe

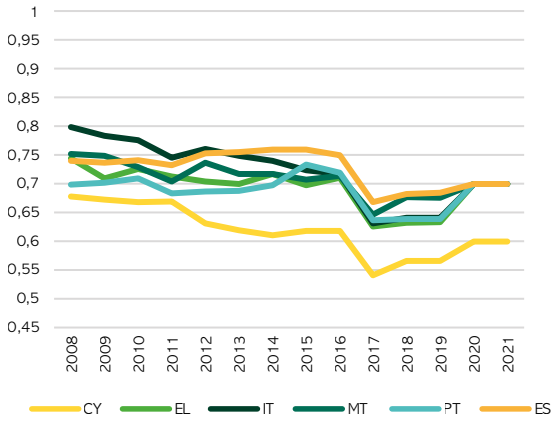


Fig. 30.4 Skills for frontier technologies in Central and Eastern Europe

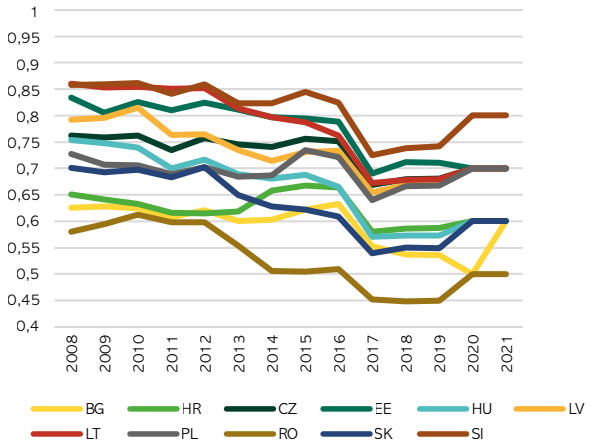


Fig. 30.5 Skills for frontier technologies in Oceania and Norhern America

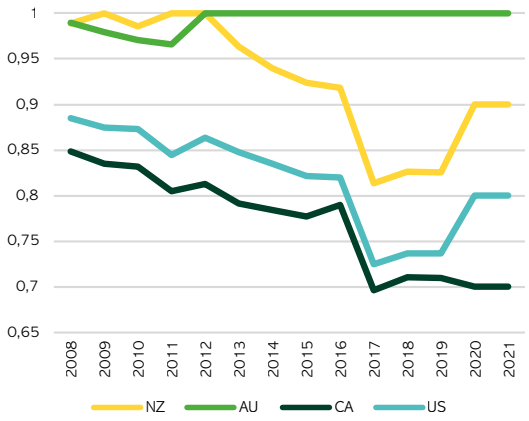
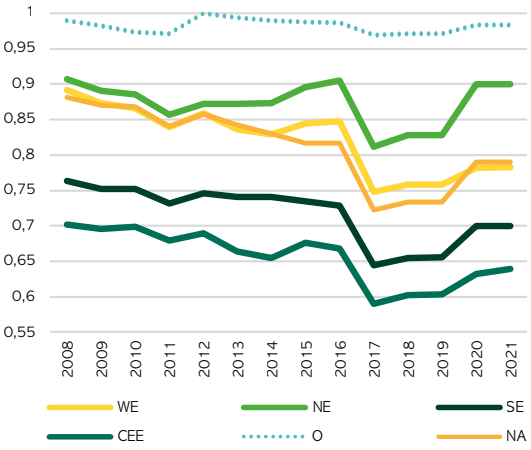


Fig. 30.6 Skills for frontier technologies by regions



Source: UNCTAD (2023)

Innovation Outputs (Global Innovation Index – WIPO)

Innovation systems go beyond science and technology systems, for the purpose of examining Innovation outputs we consider the composite Innovation Output Index elaborated by the GII (Global Innovation Index), which includes multiple indicators in two main categories: Knowledge and Technology Outputs (including Knowledge creation, Knowledge impact and Knowledge diffusion) and Creative Outputs (including Intangible assets, Creative goods and services, and Online creativity, only since 2013). The collected Innovation output is based on information produced by INSEAD from 2007 to 2012, but in particular on the information provided annually since 2013 by WIPO (2023). In Western Europe the top performers are: Switzerland, the Netherlands, Germany and the UK in a stable trend, on the other extreme Austria and Belgium have been regularly the poorest performers.

The Northern European countries show important and divergent trends in terms of innovation outputs with Sweden being a regular high performer and Norway a poor performer in innovation in a declining trend.

The Southern European group shows also remarkable differences but a convergent trend. Malta emerged as a top performer in 2013 but gradually converged to the more stable group of Spain, Italy, Portugal and Cyprus. Greece is clearly the poorest performer and was characterised by a declining Output Innovation Index.

The largest group of Central and Eastern European countries shows more regular and similar trends, with Czechia and Estonia as top performers and Romania, Croatia, Hungary and Poland as the poorest performers.

In Oceania both countries show declining trends from 0.46 in 2014 to 0.34 in 2021. Canada has also showed a similar trend than Oceania, and the United States slightly increased its innovation output index at a relative medium high level (0.51 to 0.55 from 2011 to 2021).

Figures 31.1-31.6: Innovation Outputs Scores in the countries and regions under study, measured as a score (min 0 and max 100)

Fig. 31.1 Innovation Output in Western Europe

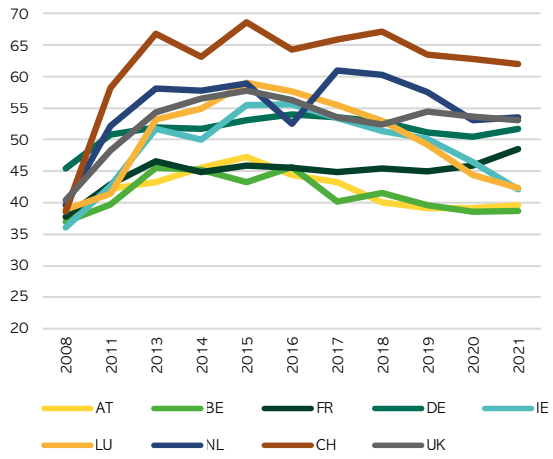


Fig. 31.2 Innovation Outputs in Northern Europe

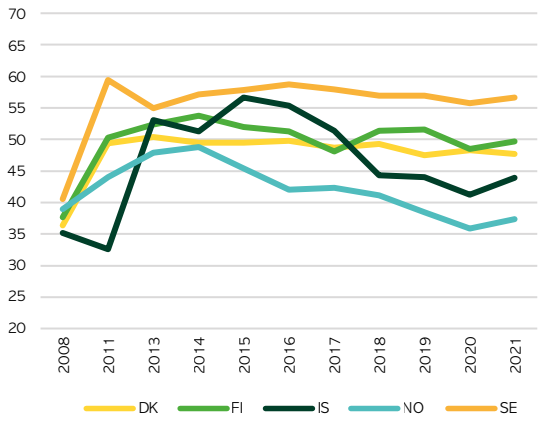


Fig. 31.3 Innovation Outputs in Southern Europe

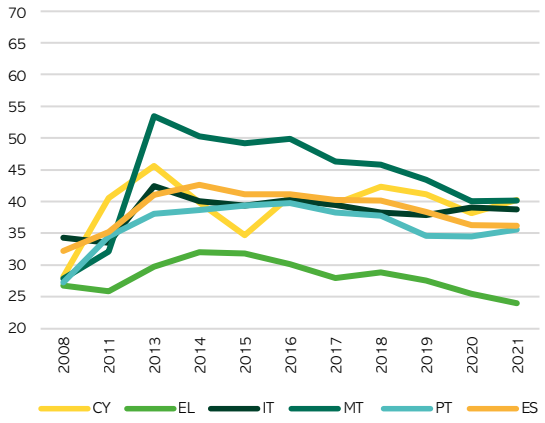


Fig. 31.4 Innovation Outputs in Western Europe

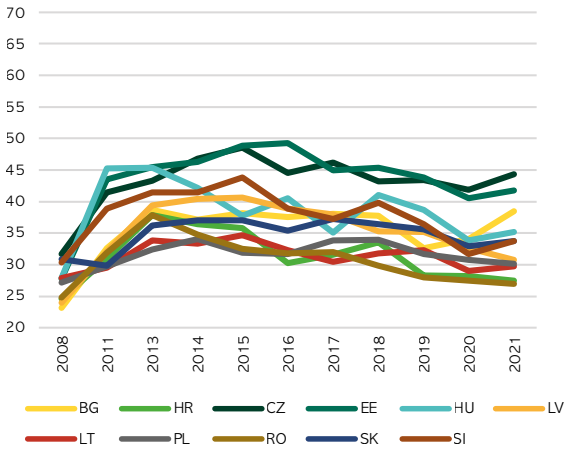


Fig. 31.5 Innovation Outputs in Oceania and North America

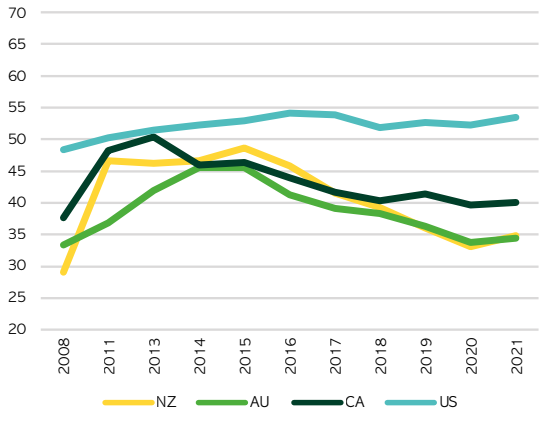
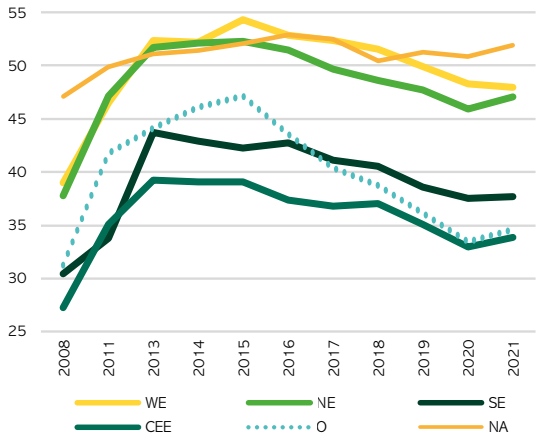


Fig. 31. 6Innovation Outputs Scores by regions



Source: WIPO (2008-2023) Global Innovation Index, https://www.wipo.int/global_innovation_index/en/

Knowledge and technology outputs

As we mentioned in the previous section the Innovation Outputs Index elaborated by the GII include multiple indicators in two main categories: Knowledge and Technology Outputs and Creative Output.

In this section we examine the Knowledge and Technology Outputs Index that includes: Knowledge creation, Knowledge impact and Knowledge diffusion. The collected Innovation output is based on the information produced by INSEAD from 2007 to 2012, but in particular on the information provided annually since 2013 by WIPO (2023).

In general, the trends in Knowledge and technology outputs by countries and regions are similar to those observed in the previous section for Innovation Output Indexes.

Figures 32.1-32.6: Knowledge and technology outputs Scores from Global Innovation Index (min 0 max 100)

Fig. 32.1 Knowledge and technology outputs in Western Europe

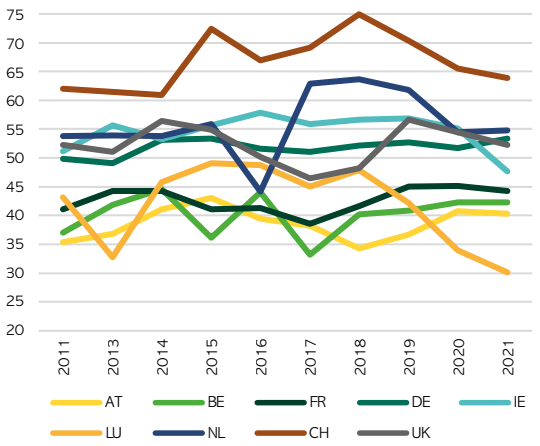


Fig. 32.2 Knowledge and technology outputs in Northern Europe

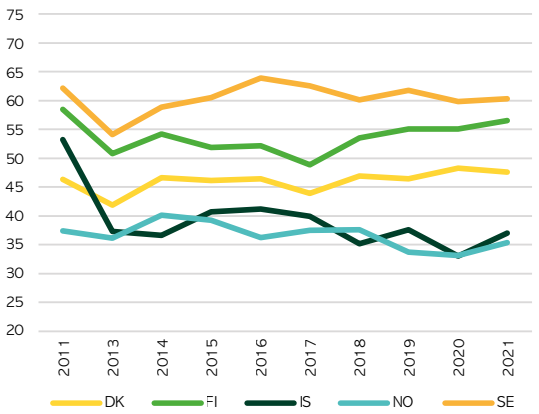


Fig. 32.3 Knowledge and technology outputs in Southern Europe

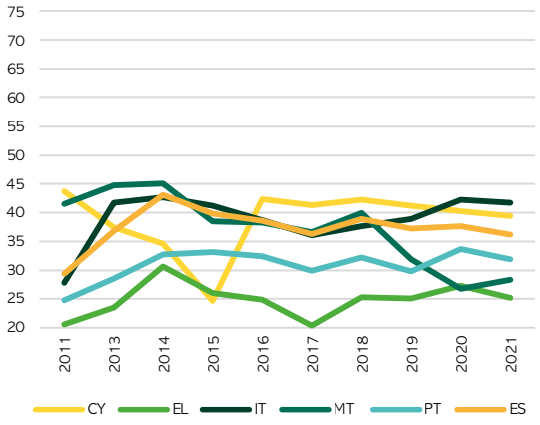


Fig. 32.4 Knowledge and technology outputs in Central and Eastern Europe

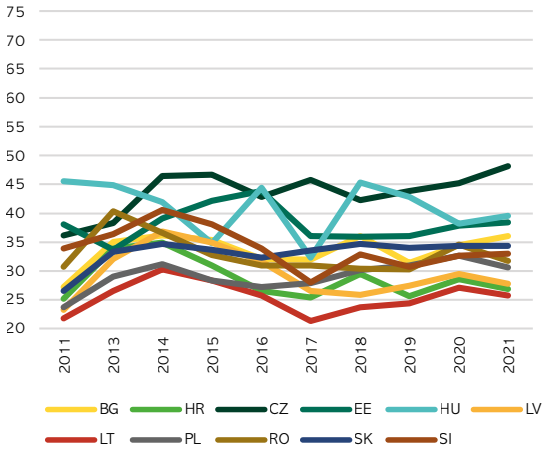


Fig. 32.5 Knowledge and technology outputs in Oceania and North America

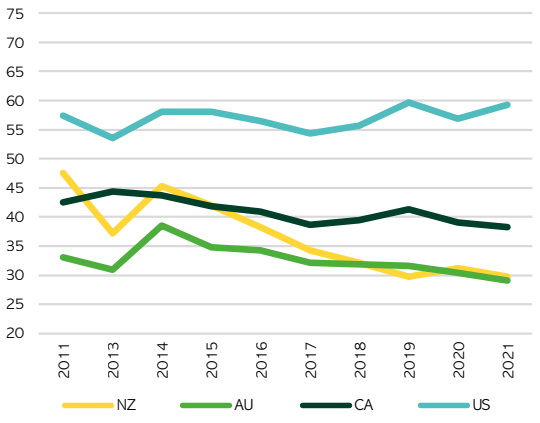
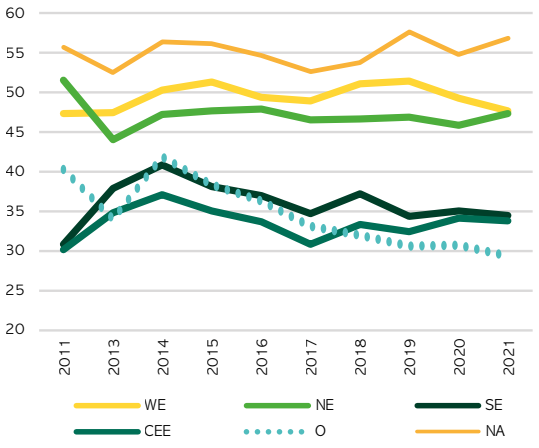


Fig. 32.6 Knowledge and technology outputs by regions



Source: WIPO (2008-2023) Global Innovation Index, https://www.wipo.int/global_innovation_index/en/

Creative Outputs

As we mentioned in the two previous sections, the Innovation Outputs Index elaborated by the GII include multiple indicators in two main categories: Knowledge and Technology Outputs and Creative Output.

In this section we examine the Creative Outputs Sub-Index that includes: Intangible assets, Creative goods and services, and Online creativity, only since 2013. The collected Creative Innovation output is based on information provided by Dutta annually since 2013 by Cornell University, INSEAD and WIPO (2013) and WIPO (2023).

In general, the trends in Cultural outputs by countries and regions are very different to those observed in the previous section for Innovation Output Indexes and Knowledge Outputs. In all the regions there is a clear decline in the Creative Outputs Scores that is more significant in Central and Eastern Europe, Oceania and less significant in North America and South Europe or Western Europe.

In Western Europe the pattern is relatively similar in all countries with Switzerland, Luxembourg and the Netherlands as top performers and Belgium, Ireland and Austria as bottom performers.

The North European countries follow a similar pattern with Iceland as an outlier from 2013 to 2018 but converging from 2018 onward.

Most of the Southern European countries also follow a similar pattern with Malta as a top but declining Creative performer and Greece as a bottom and declining performer.

The largest group of Central and Eastern Europe also follows the same pattern with Estonia on top and Romania at the bottom.

New Zealand, Australia and Canada show also declining trends in Creative Outputs Scores from 2013 to 2021, and the United States maintains a relatively stable score in Creative Outputs in line with the North American trend.

Figures 33.1-33.6: Creative Outputs Scores in the countries and regions under study, measured as a score (min 0 and max 100).

Fig. 33.1 Creative Outputs in Western Europe

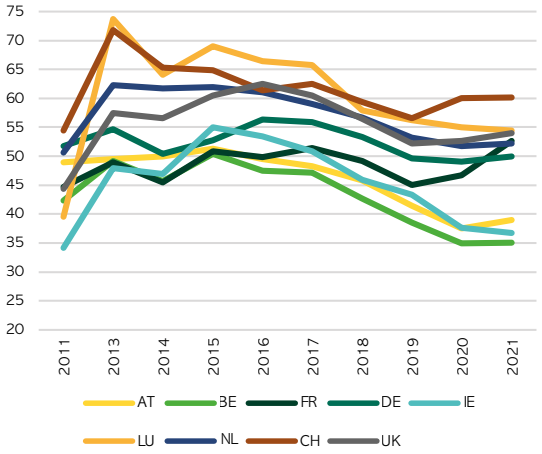


Fig. 33.2 Creative Outputs in Northern Europe

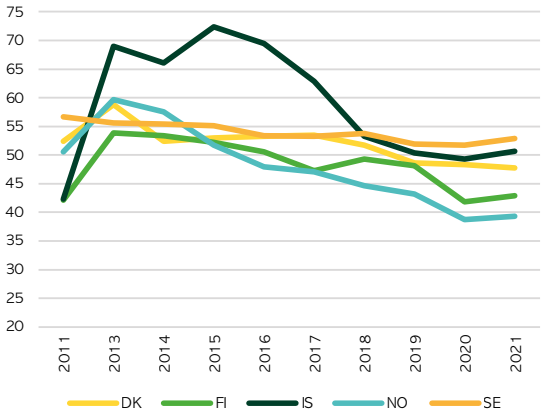


Fig. 33.3 Creative Outputs in Southern Europe

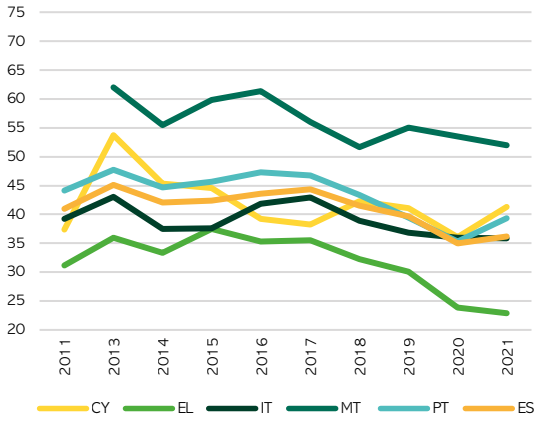


Fig. 33.4 Creative Outputs in Central and Eastern Europe

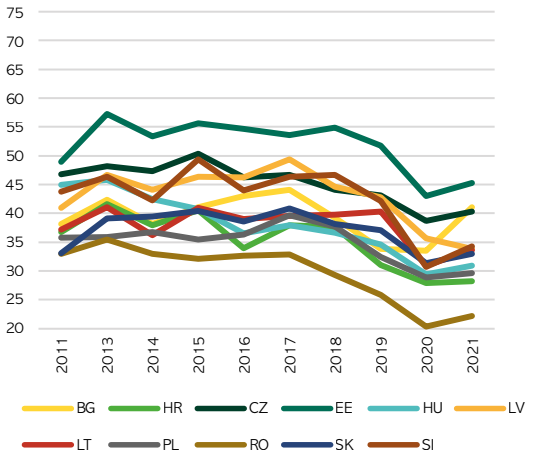


Fig. 33.5 Creative Outputs in Oceania and North America

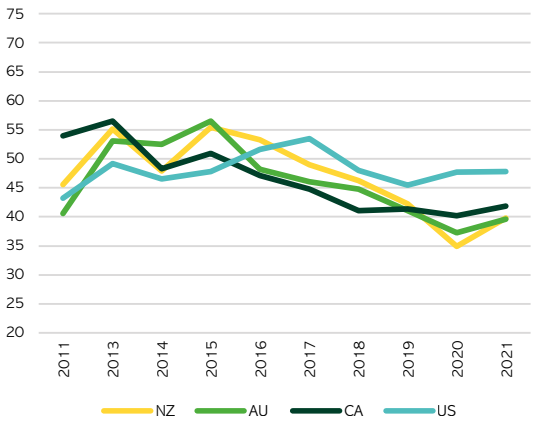
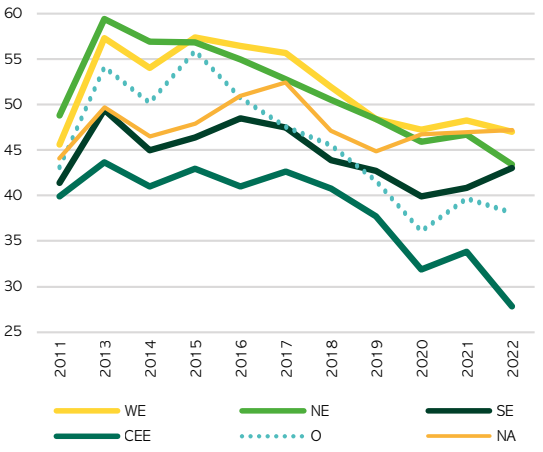


Fig. 33.6 Creative Outputs by regions



Source: WIPO (2008-2023) Global Innovation Index, https://www.wipo.int/global_innovation_index/en/

3.4.3. Innovation Efficiency ratio

We used the information provided by the Global Innovation Index (GII) project, which was launched in 2007 and enhanced from 2013 onwards. This has the simple goal of determining how to find metrics and approaches that better capture the richness of innovation in the countries and goes beyond traditional measures such as the number of research articles and the level of R&D expenditure. We have estimated the Innovation Efficiency which is the ratio of the Output Innovation Index to the Input Innovation Index. This Innovation Efficiency shows how much innovation output a given country is getting for its inputs. This ratio is a common indicator to evaluate innovation in EU members and candidates (Aytekin et al 2022, and Nasir & Hang 2024).

In most of the countries a decline in the Innovation Efficiency ratio was observed.

In Western Europe the most Innovative Efficient countries have been Switzerland and the Netherlands which maintained the ratio, and Luxembourg that was the top performer until 2016. On the other hand the bottom performers have been Austria and Belgium with a declining trend since 2016.

In Northern Europe, Sweden, Finland and Denmark have been stable in terms of the innovation ratios, Iceland has been irregular and volatile but converging to the regional group, and Norway has diverged in a declining trend in its innovation efficiency.

The Southern European group showed a relatively stable trend in the largest economies: Italy, Spain and Portugal and, also, Cyprus; but a more volatile and declining trend, on the one hand, with Malta as a top performer in 2013, and on the other hand a declining and divergent innovation efficiency ratio in Greece since 2014.

In Central and Eastern Europe there is a relatively more common pattern of declining innovation efficiency that is significant in all levels, with Hungary on top in 2013, in the middle Slovenia and at the bottom Poland and Latvia.

New Zealand, Australia and Canada show also common declining trends in their Innovation Efficiency ratio from 2014 to 2021, and the United States maintained its innovation efficiency.

Figures 34.1-34.6: Innovation Efficiency from Global Innovation Index Report (Ratio Innovation Output Score/Innovation Input Score)

Fig. 34.1 Innovation Efficiency in Western Europe

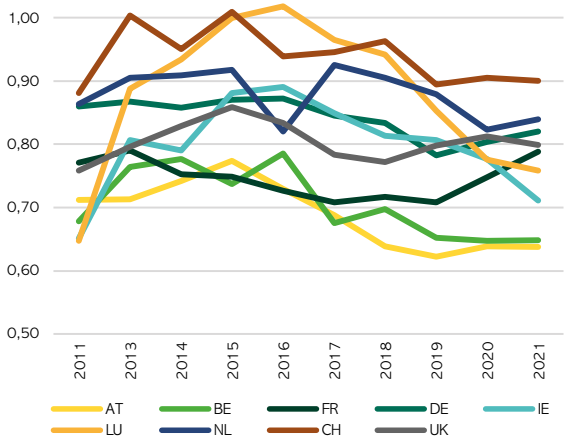


Fig. 34.2 Innovation Efficiency in Nothern Europe

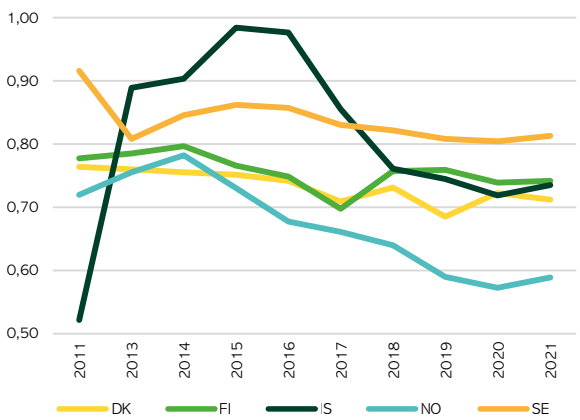


Fig. 34.3 Innovation Efficiency in Southern Europe

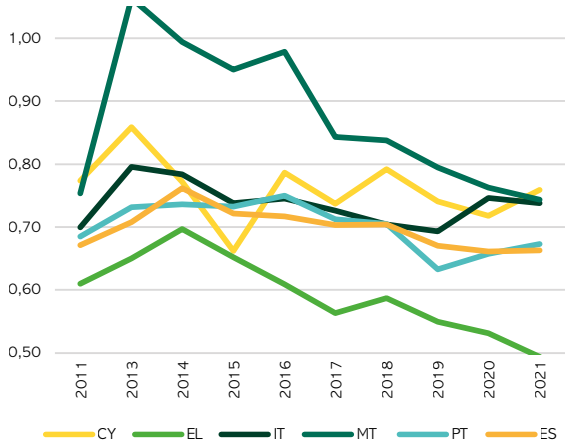


Fig. 34.4 Innovation Efficiency in Southern Europe

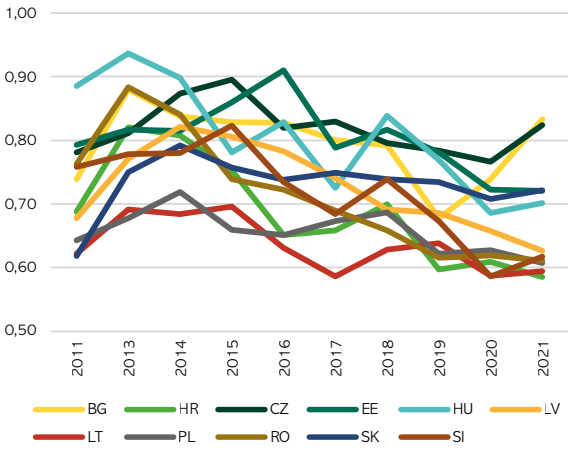


Fig. 34.5 Innovation Efficiency in Oceania and North America

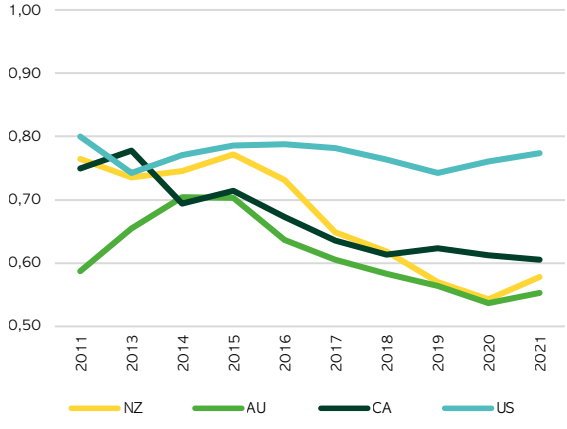
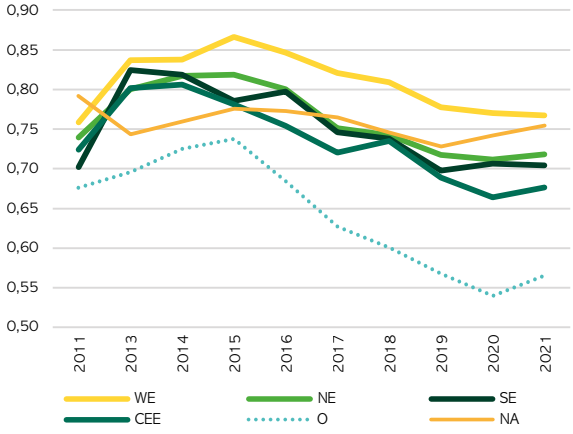


Fig. 34.6 Innovation Efficiency by regions



Source: WIPO (2008-2023) Global Innovation Index, https://www.wipo.int/global_innovation_index/en/

3.4.4. Satisfaction and trust

To assess the evolution in the satisfaction and trust on Science, Technology and Innovation we use two indicators elaborated by two central international organisations. On the one hand for Technology, the UNCTAD that published the Technology and Innovation report since 2011 and provided plenty of statistical information on the topic. On the other hand for Innovation, the WIPO publishes the Global Innovation Index report since 2013.

Frontier Technology Readiness (FTRI) Index (UNCTAD)
The Frontier Technology Readiness (FTRI) Index assess countries' readiness for using, adopting and adapting frontier technologies. FTRI is comprised of sub-indexes (three of them considered as outputs in the previous section): ICT deployment, skills, R&D activity, Industry activity and access to finance.

The FTRI is inspired by the concept of Technology Readiness (TR) that aims to understand people's propensity to embrace and use cutting-edge technologies (Blut & Wang 2019). The initial TR construct considers four dimensions—innovativeness, optimism, insecurity, and discomfort—that collectively explain technology usage.

The FTRI assesses countries' preparedness for frontier technologies. It presents a "readiness index" ranking 166 countries based on five "building blocks". Among various frontier technologies, 17 are covered in this annex: AI, IoT, big data, blockchain, 5G, 3D printing, robotics, drones, gene editing, nanotechnology, solar PV, concentrated solar power, biofuels, biomass and biogas, wind energy, green hydrogen and electric vehicles. In general, the most ready countries in the world are the United States, Sweden and Switzerland and the Netherlands (UNCTAD 2023).

Figures 35.1-35.6: Frontier Technology Readiness Index (Index 0 to 1) 2008-2021

Fig. 35.1 Frontier technology readiness in Western Europe

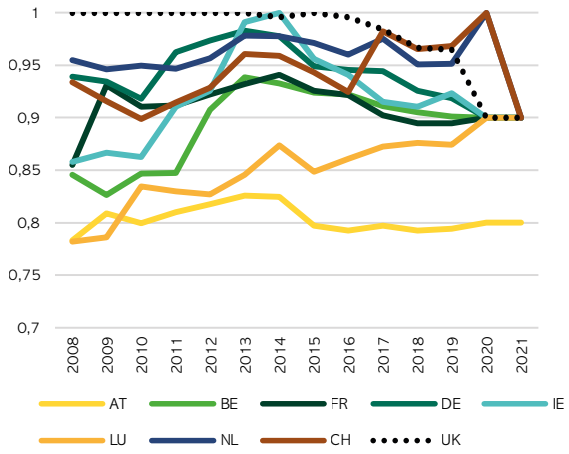


Fig. 35.2 Frontier technology readiness in Northern Europe

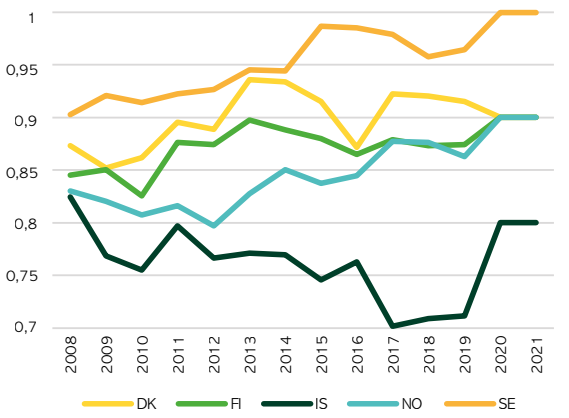


Fig. 35.3 Frontier technology readiness in Southern Europe

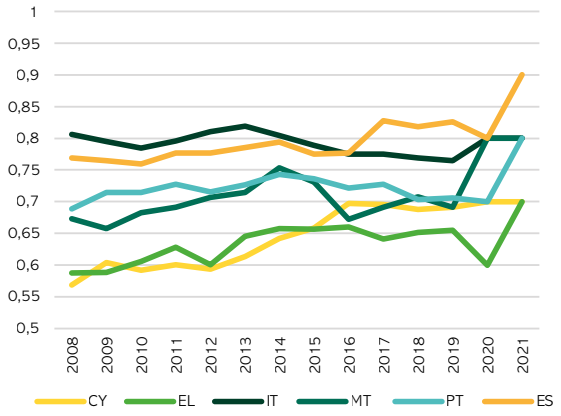


Fig. 35.4 Frontier technology readiness in Central and Eastern Europe

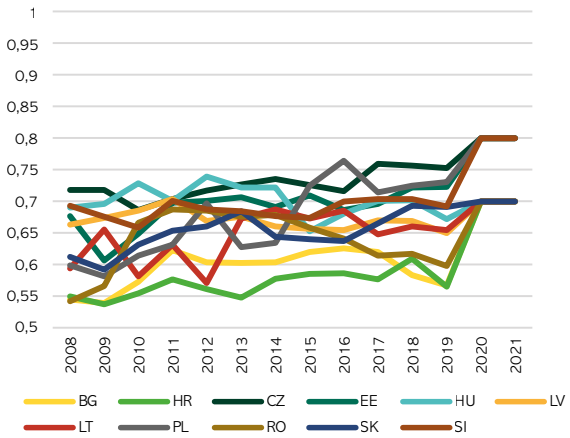


Fig. 35.5 Frontier technology readiness in Oceania and North America

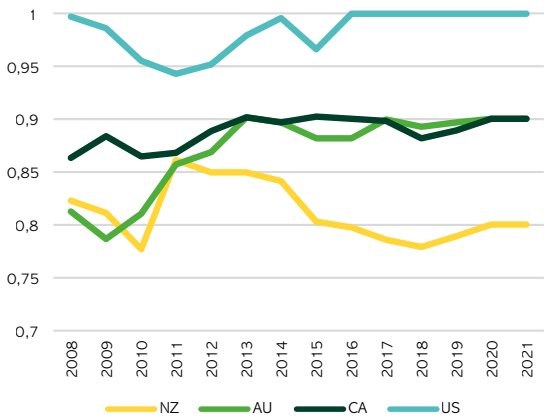
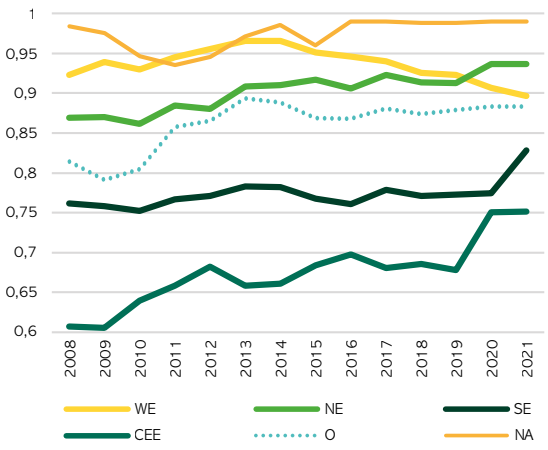


Fig. 35.6 Frontier technology readiness by region



Source: UNCTAD (2011-2023) https://unctad.org/topic/science-technology-and-innovation/technology-innovation-report

Global Innovation Index

The GII is an annual assessment of countries by their capacity for, and success in, innovation, published by the World Intellectual Property Organization (WIPO). It was started in 2007 by INSEAD. Until 2023 it was published by WIPO, in partnership with Cornell University, INSEAD. The GII is based on both subjective and objective data derived from several sources, including the International Telecommunication Union, the World Bank and the World Economic Forum.

The GII assess the evolution of innovation against the background of the economic and political environment. The GII captures as many dimensions for innovation as possible, the GII comprises around eighty variables. The different metrics that the GII offers help to monitor performance and benchmark developments against countries within the same region, like this study.

The GII is computed by taking a simple average of the scores in two sub-indices, the Global Innovation Input Index and the Global Innovation Output Index, which are composed of five and two pillars respectively. Each of these pillars describes an attribute of innovation, and comprise up to five indicators, and their score is calculated by the weighted average method.

Figures 36.1-36.6: Global Innovation Index Scores (min 0 max 100) 2008-2021

Fig. 36.1 Global Innovation Index in Western Europe

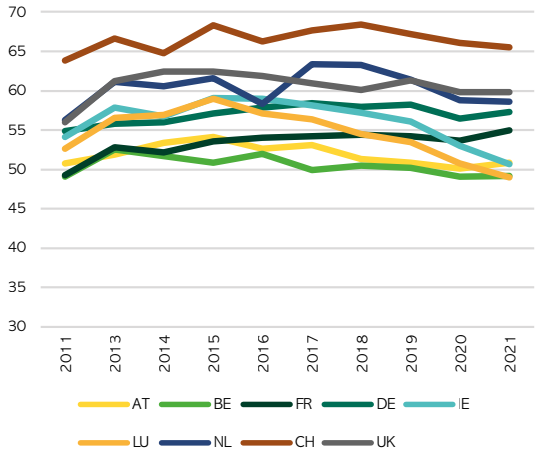


Fig.36.2 Global Innovation Index in Northern Europe

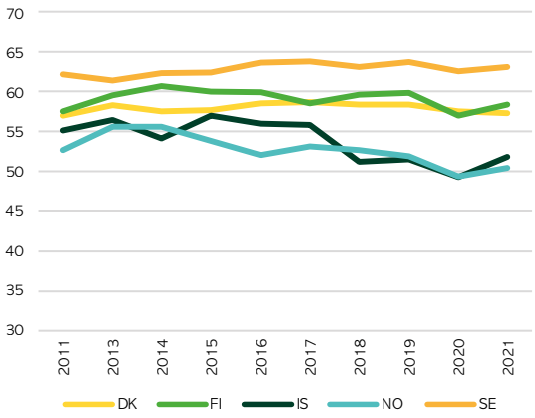


Fig. 36.3 Gobal Innovation Index in Southern Europe

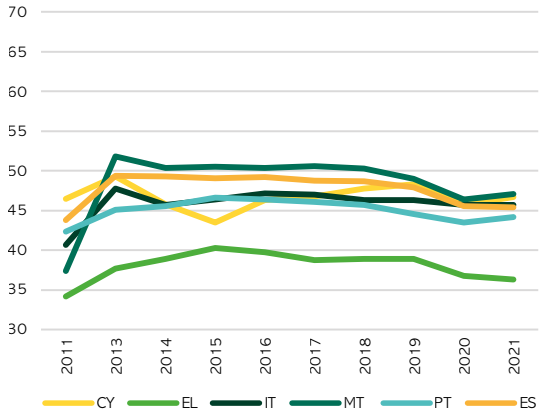


Fig. 36.4 Global Innovation Index in Central and Eastern Europe

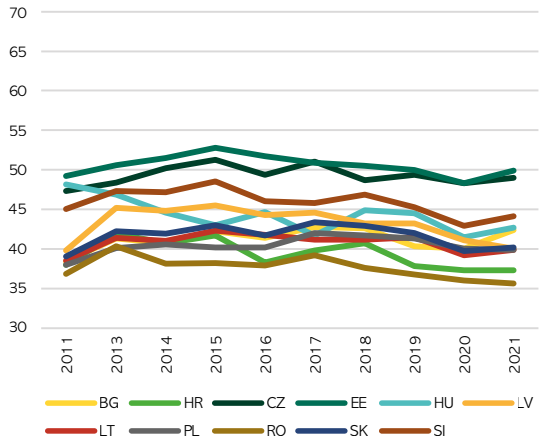


Fig. 36.5 Global Innovation Index in Oceania and North America

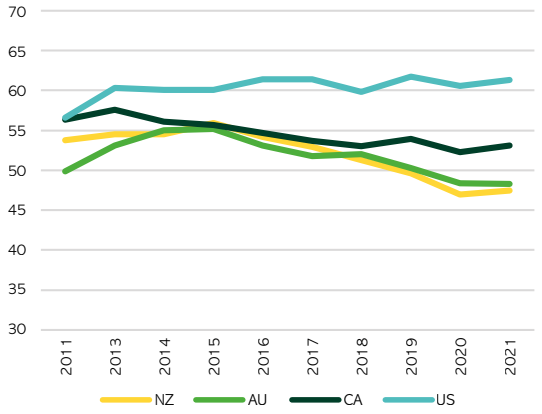
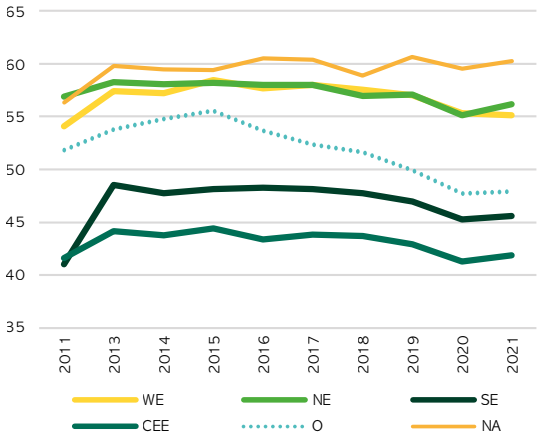


Fig. 36.6 lobal Innovation Index in Oceania by regions



CONCLUSIONS

This chapter examined three core areas of societies: Economy, Infrastructure and transports systems and Science, Technology and Innovation Systems. Each of these core areas was analysed using a tailored version of the overall conceptual framework used in the Public Sector Performance Programme: PSPP (EIPA, 2023). The main objective of this study was to examine in detail the performance of 35 countries in the case of these three core areas. The selection of countries and regions selection was established by the PSPP (EIPA, 2023). For the area studies, this chapter followed a longitudinal approach, and the time period under consideration ranges from 2007 to 2021 wherever data was available.

Overall, we noted that the period under analysis was one of significant volatility and turbulence, and dominated by multiple crises: firstly, the financial and the euro crisis (2007-2014); secondly, the first instance of European "disintegration" with the Brexit fall out (from 2016 onwards) and, thirdly, the COVID-19 pandemic crisis (2020-2022). These crises provided the backdrop in which we can observe how specific public policies attempt to compensate for some of the effects of these crises on Economy, Infrastructure and transport systems, and Science, Technology and Innovation systems. A good case in point in the EU are the counter-cyclical policies to promote investment and growth, the European Fund for Strategic Investments (EFSI) from 2015 to 2020, (see Clifton et al., 2018 and Mertens et al., 2021), the launch of the Green transition agenda in infrastructure, transport and taxation, with the goal of reaching climate neutrality by 2050, and the compensatory public policies introduced during the pandemic (see Clifton et al., 2020).

Our analysis of the Economy was based on different indicators of inputs (Investment by sectors and activities) and outputs (GDP and GDP per capita). Both inputs and outputs displayed regular patterns by countries and regions, with specific countries being clear outliers. Outliers are clearly seen during the "great recession" in terms of drastic drops in Investment, across each region, namely, Ireland in Western Europe; Iceland in Northern Europe; Greece and Cyprus in Southern Europe, and Latvia in Central and Eastern Europe, and the US in North America. In general, all regions underwent the negative effects of the financial crisis on their average Economy inputs (Investment) and output (GDP), but this was notably more dramatic in the regions of Southern Europe and Central and Eastern Europe, whilst it was also more protracted in these two regions than the others considered, lasting from 2007 to 2014, in contrast to the other four regions that recovered from 2010 onwards.

Investment as a key input in the Economy followed different trends when it was disaggregated into Public, Corporate and Household activities. Public investment followed a similar pattern to the overall Investment. Government investment was relatively stable in Oceania, North America and Western Europe, with the exception of Ireland. In Northern Europe, this increased, except for the case of Iceland. Government Investment declined dramatically during the financial crisis in Southern Europe and Central and Eastern Europe. In contrast, Corporate Investment was relatively stable, declining slightly during the financial crisis, recovering from 2010 until the pandemic, then declining again in 2020 and 2021. Ireland was the outstanding outlier, increasing investment from 2015 onwards. Finally, Household Investment declined in all the observed regions until the COVID-19 crisis. However, the decline was continuous and significant in Southern Europe and Central and Eastern Europe (and Australia), but relatively modest in Western and Northern Europe. Ireland was, again, an outlier, moving from levels that doubled the regional average in 2007 and 2008 to ones below half that of Northern Europe. This fall in household investment was clearly related to the bursting of the housing bubble (see Mercille 2014 and Clifton et al., 2018).

GDP per capita as a key indicator of output of economic activity slightly declined in all regions until 2009, except in Southern Europe, which declined continuously until 2014. The recovery of GDP per capita in all regions halted with the COVID-19 crisis from 2020 and had partially recovered by 2021. Again, outlier countries in each region were identified: Ireland underwent the most significant decline from 2007 to 2013, then recovered seeing a doubling of its GDP per capita from 2013 to 2021 (in part explained by a change in National Account records and a boom in FDI (Barry and Bergin 2010 Bohle and Regan 2021). In Northern Europe, Iceland followed a similar, though more modest pattern, to Ireland. Southern Europe was the region most affected by the financial and then the health crises, Greece being the most dramatic case. Most Central European countries suffered from the financial crisis until 2009, after which GDP per capita recovered steadily until the pandemic, when a decline followed, from 2020.

Comparing the input and output performance, we examined the correlations between the annual average rates of growth of Investment and GDP between 2007 and 2021. A positive correlation could be observed in the economies going in two directions. On the one hand, Ireland, Malta, Romania, Portugal and Luxembourg were high performers (demonstrating between 6% to 8% GDP annual growth). On the other hand, Greece, Spain, Portugal and Italy were the poorest performers (demonstrating only between 0% and 3% GDP annual growth). It can also be observed that Central and Eastern Europe exhibited stronger annual growth rates in GDP than in Investment (GFCF), whilst Western and Northern European economies, as well as North American economies, exhibited higher annual growth rates in Investment than GDP. In fact, Latvia, Slovenia. Slovakia and Croatia saw a GDP grow at around 4% annually with an Investment growth between 0% and 1.5%, whilst in Austria, Germany, Sweden, Norway, France and the US GDP growth was at around 5% annually but their annual investment growth reached between 3% and 5%. Investment was more effective in the Eastern European countries. These results were consistent across the whole examined period if we omitted the effects of the COVID-19 pandemic crisis.

Beyond input and output, this chapter explored relevant measures of people's material well-being, such as productivity (measured as GDP per worker or GDP/L, and GDP per hour worked, or, GDP/H). In terms of GDP per worker, Western Europe evolved in a regular way, with Luxemburg and Ireland as top outliers, in the strongest position, and the UK in the weakest position. Southern Europe was the weakest regional performer as regards GDP/L. In this region, there was greater heterogeneity. Despite this, Greece was the weakest performer during the whole period, whilst Portugal and Spain performed positively. It was also the region to be the most affected by the COVID-19 pandemic. Central and Eastern European countries noticed a fall in GDP/L during the financial crisis, but recovered and grew quite steadily, until the COVID-19 pandemic. Within this group, Poland and Latvia were impressive performers. The economies of Oceania and North America were relatively unaffected by the financial crisis as regards GDP/L; in this group, the US was the strongest performer.

In terms of GDP per hour worked, Western Europe reflected a regular pattern again across most economies. The strongest performers in this group were Luxembourg and Ireland, and the weakest, by some margin, was the UK. The Northern European economies suffered a drop as regards GDP per hour worked during the financial crisis, however, all recovered and grew from 2009 onwards. The Southern European group was characterized by heterogeneity. The worst performer, by far, was Greece, followed by Cyprus, whilst Spain, Portugal and Malta saw GDP/H increase during the financial crisis. The Central and Eastern European group increased overall between 2007 and 2021, with Latvia, Slovakia and Slovenia as the strongest performers. The economies of North America and Oceania proved to be resilient and increased their GDP/H across the period, the US being the top performer.

This chapter identified correlations between productivity and well-being. In developed countries, such as the ones in this study, the impact of higher incomes on well-being is unclear. It seems life satisfaction has barely increased in the US for many decades, despite real income and productivity gains. Productivity growth and improvements in well-being are closely interconnected and can create positive, mutually reinforcing feedback loops.

Regarding effort or hours per worker (H/L), overall, this declined across all the countries and regions between 2007 and 2021 (see Figure 6.6). In Western Europe, Ireland was an outlier, with the highest result, and an increasing trend from 2009 to 2019. In contrast, Germany demonstrated a lower H/L with a declining tendency across the whole period. Southern European countries showed the highest H/L of all groups, with Greece as a clear outlier, with the highest effort by worker, a trend that seems promoted by recent legislation to "increase the maximum working daily working time to 13 hours in a six-day work week" (European Parliament 2023). Finally, COVID-19 appeared to have a more negative impact on H/L than the financial crisis in all Southern and Western European countries, the main exception being the Netherlands.

To examine the patterns between outputs and outcomes we firstly analysed the correlation between GDP per capita and Productivity per person employed (GDP/L); secondly, we examined the correlation between GDP per capita and productivity per hour worked (GDP/H). To control for the effects of the crises, we compared the correlation in 2007-2013 with that in 2013-2019.

During the financial crisis, the correlation for 2007 and 2013 did not reveal regular patterns by regions. In most of the countries from different regions there were losses in GDP per capita with an improvement in GDP/L: Belgium, Ireland, Luxembourg, the Netherlands, Denmark, Iceland, Sweden, Portugal, Spain, Czechia and Latvia. In a significant number of countries, there were losses in both GDP per capital and GDP/L: UK, Luxembourg, Finland, Norway, Greece, Italy, Estonia and Hungary. Exceptionally, some countries in Western Europe saw improvements in GDP per

capita with losses in GDP/L: these were Austria, Germany and Switzerland. Finally, in Oceania and North America, there were gains in both GDP per capita and GDP per employee. This only occurred in a few EU countries, including Latvia, Poland and Slovakia.

In the recovery phase, the correlation analysis for 2013 and 2019 showed that all the examined economies improved their GDP per capita and only two experienced declines in GDP per employee (Greece and Luxembourg). Central and Eastern European economies underwent a much higher increase in GDP per capita than in GDP/L, which indicates a sustainable catch up to the EU and OECD average levels.

The Economy section of the chapter finally examined different indicators associated with satisfaction and trust by citizens as regards the performance of the Economy at the national level. Indicators include here regulatory quality, control of corruption, competitiveness and happiness.

Regulatory quality was high and stable in Oceania and Northern Europe, at a medium level in Western Europe, unstable in North America (in particular, the US), and relatively low and on a declining trajectory in Central-Eastern and Southern Europe. The patterns by regions showed clearly outliers, including Iceland in Northern Europe, Greece in Southern Europe, Romania and Croatia in Central and Eastern Europe, and the US in North America. Control of corruption was rather diverse across the various regions. Among the regional groups, France, Italy and the US emerged as poor performers whilst Iceland, Greece, Bulgaria or Romania are again poor performers in the respective regions. The Global Competitiveness Index, or GCI, (the latest publication of which was in 2019) also indicated diverse results. In particular, Ireland and Luxembourg, Iceland, Greece, Croatia, Bulgaria and Romania all performed poorly in their respective regional groupings. In general, all groups of countries improved their GCI from 2010 onwards. In this case, the US is the top performer of all the examined countries. Finally, we examine happiness as a key indicator of satisfaction and trust by citizens with the economy in particular and society more generally. The regional grouping with the highest level of happiness is Northern Europe, which is on a slight upward trend, followed by North America and Oceania which, despite positive results in other outputs such as GDP per capita, other outcomes and GCI, show a slight decline in happiness and life satisfaction. In these country groupings, the US has the lowest level in North America, corresponding to the Easterlin Paradox (Easterlin & O'Connor 2022). In contrast, it was notable that, in Central and Eastern Europe, happiness increased significantly over the period, with Czechia and Latvia as strong performers, corresponding with new evidence that, in this region, "economic growth does go with greater happiness" (Veenhoven and Vergunst 2014).

The second section of the chapter examines Infrastructure and Transport systems. Following a similar approach to that for the Economy in general, it can be observed that the main Infrastructure items of investment consist of operative buildings and infrastructures (including Transport Infrastructure such roads, bridges, ports or airfields) as the single largest component of Investment or GFCF (around a third). The study also analysed Transport equipment (including ships, trains, aircraft), which is also a key performance indicator of investment (around a tenth of total investment and much higher in countries like Luxembourg: 21% and Ireland: 18.1%).

In terms of Infrastructure investment effort, Central and Eastern Europe and Oceania (Australia) began during the period under study as the strongest performers, but declined across the period. Southern Europe started at an intermediate infrastructure investment level, and then declined significantly in parallel to the financial crisis, with only a partial recovery by 2019. Northern and Western Europe and North America remained stable throughout, with relatively low investment levels in infrastructure.

Transport equipment investment followed similar patterns as overall infrastructure but with more diversity inside the country groupings. Central and Eastern Europe started out as the best performers, but then saw dramatic declines. Despite this, by the end of the period, this group still exhibited the highest ratio. Western and Northern Europe, in addition to North America, declined in this indicator, and did not succeed in fully recovering 2007 levels by 2021. The outliers in this indicator were Ireland, Luxembourg and Iceland. This trend was even more dramatic for Southern Europe, with Greece as the outlier, going from the top in 2007 to the bottom since 2010.

This chapter also compared Infrastructure and Transport systems. Infrastructure and transport investment is a key determinant of performance for the economy in particular and society in general, which depends on geographical and demographic variables, such as remoteness, whether a country is landlocked or an island, orography, climate and population. The chapter studies investment in the four main international transport activities, namely, road, rail, maritime ports and airports. Firstly, for either a lack of information or the fact that this is not relevant for most

countries, inland waterway transport infrastructure and equipment are not examined. These are, however, important in some countries, such as the Netherlands, Romania, Belgium and Germany (more than 10% of Transport Infrastructure). Secondly, in the case of landlocked countries, such as Austria, Czechia, Hungry, Luxembourg, Slovakia and Switzerland, maritime port investment is irrelevant or not registered. Thirdly, countries such as Cyprus, Iceland and Malta do not have railway systems.

In terms of road transport investment, the highest ratios were in Central and Eastern Europe, despite the fact that this investment was on the decline. Oceania had a relatively stable investment level, whilst the other regions invested at lower rates and exhibited a downward tendency along the period.

Regarding the railway investment effort, at the beginning of the period, Southern Europe was the most significant investor, in particular Spain and Italy. However, these levels fell dramatically during the financial crisis. In Italy, levels started to recover from 2019, until the COVID-19 pandemic hit again. Western and Northern Europe were more stable, actually growing overall during the whole period, whilst Central and Eastern Europe and Oceania exhibited volatility, but both grew during the period. In contrast, this investment category was not significant in North America.

Data on port investments was insufficient for the comparative purpose of these study. Whilst this was justified in the case of landlocked countries, there was also a lack of statistical reporting by key countries including the Netherlands, UK, Malta, Cyprus, Australia and the US. Across the reporting countries, port investment by regions saw a convergence in the period under study. Central and Eastern Europe was the highest performing region in 2007, whilst the lowest was North America. Central and Eastern Europe, Oceania and Southern Europe all underwent declines during the period. At the same time, regions which commenced at lower investment levels, such as Northern Europe and Western Europe and Canada, tended to remain either stable, or increased slightly.

Airport investment by region underwent a gradual convergence downwards. In 2007, this category had high levels in Western Europe (there is a lack of information about the Netherlands and the UK) and low levels in Northern Europe. By the end of the period, Northern Europe was the top investor, though on a slightly downward trajectory, and Central and Eastern Europe and Southern Europe underwent a sharp fall.

In terms of freight road transport as output, Central and Eastern Europe was the clear top regional performer, with Lithuania and Poland at the top and Slovenia at the bottom.By contrast, Western Europe converged downwards with Luxembourg at the top in 2007 but converging towards its peers. In Northern Europe, Oceania and North America, road freight was much more stable. Southern Europe exhibited also a flat trajectory though there was great diversity as regards the countries within this group.

In the case of road passenger as output, Central and Eastern Europe was a prominent performer, albeit on a downward trajectory across the period. The other regions exhibited lower results, all in modest decline, especially in the second half of the period under study (Figure 17.6).

Rail freight as output was strong and increasing in Oceania. This indicator was also relatively strong but declining in North America and Central and Eastern Europe. The other European regions were relatively flat with lower and declining values.

Rail passengers' outputs were relatively stable and slightly increasing in all regions except the leader: Central and Eastern Europe, followed by Southern and Northern Europe, which is indicative of an European convergence.
By contrast, lower rail freight output indicators were observed in Oceania and North America.

Port traffic of containers as a port transport output increased notably in Southern Europe, in particular in Greece, followed by Oceania. Western Europe, with Belgium and the Netherlands, and Central Eastern Europe with Slovenia, represented key intermediate players, with the rest of the regions showing lower and flat values.

Airport freight transport followed a diverse trend. Western Europe showed the highest values with the Netherlands as a key but declining performer, followed by Oceania and North America. All, however, were on a downward trajectory across the period. The three reporting countries from Northern Europe and Southern Europe grew but were hit by COVID-19. Southern Europe was also negatively affected by COVID-19, whilst Central and Eastern Europe exhibited low and flat output values.

Air passengers show very diverse output indicators, depending on the source and the reporting statistics. Certain countries like Ireland, Iceland, Malta, Latvia and Hungary are clearly outliers in terms of passengers independent of the distance travelled. It was noticeable that COVID-19 affected drastically the number of passengers that carriers registered in these countries (ICAO 2023). Independently of these outliers, air passenger outputs have increased in all regions, in particular in Central and Eastern Europe.

The second passenger output measures passengers by kilometre in terms of the economic activity of countries compiled by EUROSTAT. This information is only available for most European countries except the UK. Central and Eastern Europe, followed by Southern Europe, with Western and Northern Europe exhibited similar results. All regions were negatively affected by COVID-19, and recovery was gradual in all cases by 2021.

In terms of the satisfaction and trust with the transport system, the Logistic Performance Index (LPI) was used as an indicator. This study shows that the strongest performers were Western and Northern Europe, with Germany, the Netherlands and Switzerland leading the way, and the weakest performers being Ireland and Luxembourg. In the case of Luxembourg and the UK, LPI deteriorated significantly from 2016 to 2022. In Northern Europe, the weakest performer was Iceland. In Southern Europe, the strongest performers were Italy and Spain, whilst Cyprus was the weakest performer. All the Central and Eastern European countries improved their LPI but still were at the lowest levels of all country groups. In North America, Canada emerged as the strongest performer. In contrast, the US displayed the highest LPI in 2007 but then saw a deterioration from 2014 to 2022.

The third section of this chapter examines Science, Technology and Innovation (ST&I) adapting, once more, the conceptual framework deployed by EIPA (2023) for ST&I. On the one hand, it analyses the key Science and Technology investment in ICT and IPR based on OECD (2013) and, on the other hand, key components of Innovation of the Global Innovation Index (GII), and the "Frontier Technology Readiness" (FTR) (UNCTAD, 2023). It also presents estimations of the Innovation Efficiency ratio, which is the result of dividing the output with the input, GII. Finally, it also examines indicators of Trust and Satisfaction, for Science and Technology, using the FTR, which measures the capacity to use, adopt and adapt frontier technologies in ICT deployment, skills, R&D activity, industry activity and access to finance for innovation, following UNCTAD (2023), and, for satisfaction with Innovation, the GII, which is the result of the Global Innovation project launched by Soumitra Dutta in 2007 and published by UN WIPO (2023).

The section first examines Science and Technology inputs investment. Firstly, in terms of investment in ICT, North America (in particular the US) and Northern Europe (in particular, Sweden) are clear leaders, followed by Western Europe (in particular Sweden, Netherlands and France). Southern Europe and Central and Eastern Europe both lagged behind in 2007, with levels of around 2% and 1.5%. While in Southern Europe, there was a slight increase during the period under study, in Central and Eastern Europe, this actually fell and diverged. Secondly, regarding the input investment in IPR, the highest performers were North America (the US), North Europe (Sweden and Denmark) and Western Europe (led by Ireland, Switzerland, France and Austria). From lower levels, Southern Europe and Central and Eastern Europe saw significant increases during the period under study. The lowest performer was Oceania, which fell during the period from its 2007 levels. Third, when we consider the inputs of the GII, which include Institutions, Human Capital & Research, Infrastructure, Market sophistication and Business sophistication, the GII by countries and regions corresponds with the previous trends of investment in ICT and IPR.

In terms of Science and Technology outputs, the section examined the three key components of the Frontier Technology Readiness (FTR) following UNCTAD (2023). Firstly, in terms of technological capacities related to ICT infrastructure for using, adopting and adapting frontier technologies, all the examined regions and countries underwent positive trends. Most of the countries in Northern Europe and Western Europe were top performers. Southern European and Central and Eastern European countries also experienced an accelerated convergence from 2015. Oceania and North America underwent similar trends. Secondly, and with regard to R&D capacity for using, adopting and adapting frontier technologies, North America was the top performing region, in particular the US, which led until 2019, followed by Western Europe (in particular Germany, France and the UK), followed by Southern Europe (Spain and Italy), Oceania (Australia), and North Europe. The Central and Eastern European countries were poor performers in R&D capacity, but did converge towards a low to intermediate level. R&D capacity has economies of scale and depends on the size of the economies or countries (OECD, 2015). Skill capacity for using, adopting and adapting frontier technologies, in all the examined regions and countries, showed a general declining trend, which differed with the previous components of FTR. The only exception to this was Australia, which maintained the maximum index, followed by Northern Europe, which recovered 2008 levels between 2020 and 2021.

The section also examined the overall innovation outputs of the GII. This is also explained by the two components of GII: Knowledge and Technology outputs and Creative Outputs. Western Europe (Switzerland, Netherlands, the UK and Germany), North America (the US) and Northern Europe (Sweden) have been the leading regions and countries. The Southern European group also reflects notable differences but a trend towards convergence. Central and Eastern European countries show lower, but more regular, convergent trends, with Czechia and Estonia as top performers, while Oceania can be found at the bottom in a divergent trend.

In terms of Knowledge and Technology outputs by countries and regions, the trends are similar to those observed in the previous sections for the overall Innovation Output of the GII. Regarding Creative Outputs, the trends by countries and regions are very different from those observed for overall innovation and Knowledge and Technology outputs. In all the regions and countries under study, there is a clear decline in the Creative Outputs Scores. These are most dramatic in Central and Eastern Europe and Oceania.

The section also examined the Innovation Efficiency, which is the ratio of the Output Innovation Index to the Input Innovation Index, based on the GII (Aytekin et al., 2022, and Nasir & Hang 2024). Western Europe emerged as the top regional performer, with North America converging, Northern Europe and Southern Europe maintaining an equidistant position, and Central and Eastern Europe and Oceania diverging. In most countries, a decline in the Innovation Efficiency ratio from 2015 to 2021 was observed.

Finally, this section examined the Satisfaction with and trust in Science, Technology and Innovation systems based on the approaches and indicators elaborated by two central international organisations, one the one hand, for Technology, the FTR, elaborated by UNCTAD (2023) and, on the other hand, for Innovation, the GII, published by WIPO (2023).

The FTR shows that North America (the US) was the top performer, followed by a diverging Western Europe and a converging Northern Europe (especially, Sweden), and Oceania. From an intermediate level, Southern Europe (especially Spain) also converged, and Central and Eastern European countries started at lower levels in 2007 but converged significantly.

The GII indicates more stable trends, with North America (the US) as the top performer, followed in a divergent trend by Western Europe and North Europe, Oceania in a more significantly divergent trend and Southern Europe and Central and Eastern Europe keeping proportionally equidistant to the other European regions.

These trends in the regions based on key indicators of Science and Technology from UNCTAD and for Innovation based on WIPO (2011 and 2023) are coherent and correspond with the observed input, outputs and efficiency criteria.

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APPENDIX: TABLES

Table 1.1: Gross Domestic Product (Million US dollars), 2007 – 2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**327133**	45898	57945	99191	**536879**	209746
Western Europe	BE	**390976**	60957	68945	120218	**681681**	290705
Western Europe	FR	**2184561**	261914	272020	684648	**3478994**	1294433
Western Europe	DE	**2985570**	429450	474062	880224	**4890605**	1905035
Western Europe	IE	**205777**	718	118292	117901	**536251**	330474
Western Europe	LU	**40857**	8114	12466	12679	**84154**	43297
Western Europe	NL	**719878**	58003	74004	192418	**1111921**	392043
Western Europe	CH	**384530**	70382	85639	82601	**661115**	276585
Western Europe	UK	**2179751**	177315	416734	520462	**3351728**	1171977
Northern Europe	DK	**213054**	34298	31396	69596	**379912**	166858
Northern Europe	FI	**200139**	20332	12397	53214	**304173**	104034
Northern Europe	IS	**12920**	139	3217	5358	**21716**	8796
Northern Europe	NO	**263415**	44057	5759	57195	**435320**	171905
Northern Europe	SE	**374246**	47270	59655	98600	**624677**	250431
Southern Europe	CY	**25227**	3119	-1377	11592	**39001**	13774
Southern Europe	EL	**323980**	-38900	4491	44468	**332930**	8950
Southern Europe	IT	**1995376**	177794	67752	494643	**2751335**	755959
Southern Europe	MT	**10193**	1868	4609	7897	**25359**	15166
Southern Europe	PT	**271333**	11288	24609	76439	**377721**	106388
Southern Europe	ES	**1468656**	20939	132230	410090	**1927531**	458875
Central and Eastern Europe	BG	**96677**	19038	16302	43562	**184589**	87912
Central and Eastern Europe	HR	**84168**	6128	7809	30308	**134652**	50484
Central and Eastern Europe	CZ	**270708**	33693	53103	114326	**479257**	208549
Central and Eastern Europe	EE	**29760**	2838	5780	13380	**57850**	28090
Central and Eastern Europe	HU	**192029**	37614	34139	74677	**356137**	164108
Central and Eastern Europe	LV	**40131**	-485	9738	13634	**66188**	26057
Central and Eastern Europe	LT	**61707**	7591	14464	27866	**122693**	60986
Central and Eastern Europe	PL	**640604**	221848	156445	308979	**1439116**	798512
Central and Eastern Europe	RO	**286132**	74435	67567	209516	**690238**	404106
Central and Eastern Europe	SK	**114075**	27680	21252	19469	**184664**	70589
Central and Eastern Europe	SI	**55646**	3746	5874	22631	**92678**	37032
Oceania	NZ	**123983**	19380	29396	55916	**241155**	117172
Oceania	AU	**826594**	166209	131950	212833	**1595175**	768581
North America	CA	**1301594**	129213	164044	278905	**2029877**	728283
North America	US	**14474228**	1125503	2606292	3174953	**23315081**	8840853

Source OECD & World Bank

Table 1.2: Gross Domestic Product (Million US dollars at 2015 prices), 2007 – 2021

Region	Country	2007	2011		2015		2019	2021	Change
Western Europe	AT	**364485**	▲	8532	▲	8954	▲ 32251	**405146**	▲ 40661
Western Europe	BE	**428112**	▲	12636	▲	21588	▲ 32922	**498161**	▲ 70050
Western Europe	FR	**2334550**	▲	33835	▲	70804	▲ 177624	**2577596**	▲ 243046
Western Europe	DE	**3113153**	▲	96027	▲	148405	▲ 239060	**3554676**	▲ 441523
Western Europe	IE	**229747**	▼	-16214	▲	78241	▲ 79481	**447784**	▲ 218036
Western Europe	LU	**53960**	▲	617	▲	5495	▲ 6101	**68994**	▲ 15034
Western Europe	NL	**739448**	▲	9559	▲	16566	▲ 74678	**846873**	▲ 107425
Western Europe	CH	**613560**	▲	34263	▲	46296	▲ 52992	**760153**	▲ 146594
Western Europe	UK	**2724179**	▼	-35370	▲	246049	▲ 239306	**3038581**	▲ 314402
Northern Europe	DK	**294567**	▼	-6878	▲	14984	▲ 29929	**341797**	▲ 47229
Northern Europe	FI	**244406**	▼	-4806	▼	-5065	▲ 20210	**256323**	▲ 11917
Northern Europe	IS	**16714**	▼	-1104	▲	1907	▲ 3201	**20051**	▲ 3337
Northern Europe	NO	**358441**	▲	1454	▲	28265	▲ 22090	**420794**	▲ 62354
Northern Europe	SE	**449585**	▲	18529	▲	36990	▲ 44718	**566859**	▲ 117274
Southern Europe	CY	**20833**	▲	898	▼	-1821	▲ 5103	**25506**	▲ 4674
Southern Europe	EL	**265969**	▼	-50525	▼	-19760	▲ 8229	**201203**	▼ -64766
Southern Europe	IT	**1991641**	▼	-77874	▼	-77130	▲ 81520	**1867907**	▼ -123734
Southern Europe	MT	**7865**	▲	696	▲	2530	▲ 3355	**14761**	▲ 6895
Southern Europe	PT	**210341**	▼	-5892	▼	-5055	▲ 22968	**215126**	▲ 4785
Southern Europe	ES	**1231003**	▼	-43617	▲	8771	▲ 127762	**1238778**	▲ 7774
Central and Eastern Europe	BG	**45651**	▲	2929	▲	2248	▲ 6668	**59436**	▲ 13785
Central and Eastern Europe	HR	**54693**	▼	-3596	▼	-355	▲ 7032	**59722**	▲ 5028
Central and Eastern Europe	CZ	**172394**	▲	3540	▲	12099	▲ 27607	**211013**	▲ 38619
Central and Eastern Europe	EE	**23407**	▼	-2576	▲	2060	▲ 4005	**28891**	▲ 5484
Central and Eastern Europe	HU	**118586**	▼	-3397	▲	9986	▲ 22210	**150830**	▲ 32244
Central and Eastern Europe	LV	**29011**	▼	-5426	▲	3677	▲ 3492	**31300**	▲ 2288
Central and Eastern Europe	LT	**38727**	▼	-2248	▲	4957	▲ 6763	**51069**	▲ 12343
Central and Eastern Europe	PL	**370981**	▲	58826	▲	47305	▲ 94392	**598303**	▲ 227322
Central and Eastern Europe	RO	**156217**	▲	5828	▲	15839	▲ 40103	**222135**	▲ 65918
Central and Eastern Europe	SK	**73818**	▲	6913	▲	8170	▲ 10587	**100845**	▲ 27028
Central and Eastern Europe	SI	**43540**	▼	-950	▲	517	▲ 7276	**52164**	▲ 8624
Oceania	NZ	**153712**	▲	3613	▲	20740	▲ 24875	**212031**	▲ 58319
Oceania	AU	**1095250**	▲	114040	▲	141290	▲ 141160	**1524322**	▲ 429073
North America	CA	**1384576**	▲	58964	▲	112969	▲ 139798	**1690932**	▲ 306355
North America	US	**16356739**	▲	280218	▲	1569064	▲ 1722954	**20529460**	▲ 4172720

Source: OECD & World Bank

Table 2.1: Investment - Gross Fixed Capital Formation (% GDP), 2007 – 2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**22,92**	-0,45	0,22	2,22	**26,48**	3,56
Western Europe	BE	**23,29**	-0,28	-0,05	1,32	**24,19**	0,89
Western Europe	FR	**23,18**	-0,76	-0,92	1,98	**24,24**	1,06
Western Europe	DE	**20,06**	0,31	-0,35	1,35	**21,76**	1,71
Western Europe	IE	**28,71**	-12,01	7,40	30,20	**23,27**	-5,44
Western Europe	LU	**18,92**	0,30	-1,90	0,09	**16,55**	-2,37
Western Europe	NL	**23,29**	-3,16	1,97	-0,85	**21,56**	-1,74
Western Europe	CH	**27,21**	-1,69	0,89	0,21	**26,62**	-0,59
Western Europe	UK	**18,06**	-2,43	1,65	0,73	**17,33**	-0,73
Northern Europe	DK	**23,51**	-5,35	1,69	1,39	**22,61**	-0,91
Northern Europe	FI	**24,20**	-1,58	-1,39	2,60	**23,66**	-0,54
Northern Europe	IS	**29,43**	-14,06	3,97	1,96	**22,70**	-6,73
Northern Europe	NO	**23,59**	-2,08	2,32	3,04	**23,19**	-0,40
Northern Europe	SE	**24,17**	-1,27	0,86	0,66	**25,64**	1,47
Southern Europe	CY	**25,55**	-6,51	-6,16	5,94	**18,25**	-7,30
Southern Europe	EL	**26,01**	-12,34	-2,91	-0,08	**13,27**	-12,74
Southern Europe	IT	**21,66**	-1,95	-2,78	1,05	**19,96**	-1,70
Southern Europe	MT	**22,95**	-4,79	6,04	-3,70	**22,01**	-0,94
Southern Europe	PT	**22,51**	-4,09	-2,90	2,59	**20,32**	-2,19
Southern Europe	ES	**29,86**	-9,84	-2,02	2,03	**19,77**	-10,10
Central and Eastern Europe	BG	**28,31**	-7,47	0,01	-2,24	**16,57**	-11,74
Central and Eastern Europe	HR	**26,55**	-6,64	-0,64	2,02	**20,73**	-5,82
Central and Eastern Europe	CZ	**29,93**	-3,18	-0,22	0,53	**26,01**	-3,93
Central and Eastern Europe	EE	**36,39**	-9,93	-1,97	0,92	**28,86**	-7,53
Central and Eastern Europe	HU	**23,69**	-4,16	2,63	4,84	**27,19**	3,50
Central and Eastern Europe	LV	**36,19**	-13,19	-1,14	1,28	**22,26**	-13,94
Central and Eastern Europe	LT	**28,60**	-10,15	1,15	1,82	**21,39**	-7,21
Central and Eastern Europe	PL	**22,47**	-1,97	-0,07	-1,50	**17,04**	-5,42
Central and Eastern Europe	RO	**35,34**	-8,10	-2,45	-2,18	**24,12**	-11,23
Central and Eastern Europe	SK	**25,43**	-2,25	0,50	-2,18	**18,94**	-6,48
Central and Eastern Europe	SI	**28,65**	-8,71	-1,29	0,91	**20,34**	-8,31
Oceania	NZ	**23,91**	-3,95	2,94	0,49	**23,83**	-0,08
Oceania	AU	**28,22**	-0,81	-2,06	-2,72	**22,93**	-5,29
North America	CA	**23,34**	0,17	0,34	-1,27	**24,01**	0,67
North America	US	**22,32**	-3,59	1,71	0,53	**21,19**	-1,14

Source: OECD & World Bank

Table 2.2: Investment - Gross Fixed Capital Formation (Million US dollars), 2007 – 2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**74969**	8858	13990	34265	**142153**	67184
Western Europe	BE	**91070**	12921	15620	36046	**164882**	73812
Western Europe	FR	**506439**	42155	35863	214512	**843249**	336810
Western Europe	DE	**598802**	96867	82918	240786	**1064282**	465480
Western Europe	IE	**59072**	-24584	43791	162120	**124786**	65714
Western Europe	LU	**7729**	1680	1225	2264	**13926**	6197
Western Europe	NL	**167684**	-11039	31672	33641	**239708**	72024
Western Europe	CH	**104620**	11468	26678	23131	**176001**	71381
Western Europe	UK	**393757**	-25161	110982	114070	**580939**	187182
Northern Europe	DK	**50096**	-5181	10418	18658	**85889**	35793
Northern Europe	FI	**48425**	1438	-425	18724	**71960**	23535
Northern Europe	IS	**3802**	-1795	1140	1461	**4930**	1128
Northern Europe	NO	**62143**	4006	8508	24902	**100949**	38806
Northern Europe	SE	**90442**	6060	17793	27226	**160175**	69733
Southern Europe	CY	**6445**	-1049	-1923	3783	**7118**	673
Southern Europe	EL	**84273**	-45285	-7801	4512	**44185**	-40088
Southern Europe	IT	**432209**	-3793	-48905	112596	**549062**	116853
Southern Europe	MT	**2339**	-149	1844	1002	**5582**	3243
Southern Europe	PT	**61076**	-9017	-4385	21794	**76766**	15690
Southern Europe	ES	**438574**	-140331	-6216	115008	**381005**	-57569
Central and Eastern Europe	BG	**27366**	-3251	3415	5143	**30583**	3217
Central and Eastern Europe	HR	**22348**	-4368	925	8430	**27917**	5569
Central and Eastern Europe	CZ	**81032**	410	13433	32838	**124646**	43614
Central and Eastern Europe	EE	**10830**	-2205	775	3753	**16698**	5868
Central and Eastern Europe	HU	**45497**	-631	13620	32925	**96829**	51332
Central and Eastern Europe	LV	**14525**	-5406	1678	3790	**14731**	206
Central and Eastern Europe	LT	**17651**	-4859	3635	7496	**26244**	8593
Central and Eastern Europe	PL	**143913**	32830	31310	43142	**245284**	101371
Central and Eastern Europe	RO	**101126**	-2892	7907	38018	**166455**	65329
Central and Eastern Europe	SK	**29006**	3846	5742	624	**34983**	5977
Central and Eastern Europe	SI	**15943**	-4098	330	5022	**18850**	2907
Oceania	NZ	**29648**	-1025	10954	13937	**57477**	27829
Oceania	AU	**233290**	38902	12955	17628	**365798**	132508
North America	CA	**303779**	32611	43991	42713	**487356**	183577
North America	US	**3231084**	-308165	800060	762492	**4939579**	1708495

Table 2.3.1: Investment, Government (% of GDP), 2007 – 2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**2,98**	▲ 0,05	▼ -0,05	▲ 0,14	**3,49**	▲ 0,51
Western Europe	BE	**1,98**	▲ 0,41	▲ 0,10	▲ 0,11	**2,73**	▲ 0,74
Western Europe	FR	**3,95**	▲ 0,02	▼ -0,56	▲ 0,25	**3,58**	▼ -0,36
Western Europe	DE	**1,97**	▲ 0,35	▼ -0,18	▲ 0,27	**2,60**	▲ 0,63
Western Europe	IE	**4,67**	▼ -2,19	▼ -0,74	▲ 0,50	**2,02**	▼ -2,66
Western Europe	LU	**3,79**	▲ 0,41	▼ -0,33	▲ 0,26	**4,05**	▲ 0,27
Western Europe	NL	**3,83**	▲ 0,26	▼ -0,53	▼ -0,17	**3,44**	▼ -0,39
Western Europe	CH	**2,63**	▲ 0,33	▲ 0,06	▲ 0,11	**3,19**	▲ 0,56
Western Europe	UK	**2,49**	▲ 0,41	▼ -0,24	▲ 0,10	**3,12**	▲ 0,63
Northern Europe	DK	**3,04**	▲ 0,28	▲ 0,30	▼ -0,39	**3,41**	▲ 0,37
Northern Europe	FI	**3,48**	▲ 0,30	▼ -0,04	▲ 0,64	**4,19**	▲ 0,71
Northern Europe	IS	**4,75**	▼ -2,02	▲ 0,16	.	**.**	.
Northern Europe	NO	**3,83**	▲ 0,22	▲ 0,83	▲ 1,13	**5,13**	▲ 1,31
Northern Europe	SE	**4,08**	▲ 0,29	▼ -0,22	▲ 0,72	**4,81**	▲ 0,73
Southern Europe	CY	**3,09**	▲ 0,86	▼ -1,78	▲ 0,34	**2,65**	▼ -0,44
Southern Europe	EL	**4,85**	▼ -2,35	▲ 1,36	▼ -1,37	**3,61**	▼ -1,24
Southern Europe	IT	**3,17**	▼ -0,26	▼ -0,51	▼ -0,09	**2,85**	▼ -0,33
Southern Europe	MT	**3,75**	▼ -0,96	▲ 1,24	▼ -0,19	**3,93**	▲ 0,18
Southern Europe	PT	**3,22**	▲ 0,27	▼ -1,24	▼ -0,43	**2,57**	▼ -0,64
Southern Europe	ES	**4,69**	▼ -0,94	▼ -1,16	▼ -0,41	**2,75**	▼ -1,94
Central and Eastern Europe	BG	**5,23**	▼ -1,82	▲ 3,23	.	**.**	.
Central and Eastern Europe	HR	**6,31**	▼ -2,69	▼ -0,09	▲ 0,80	**4,68**	▼ -1,63
Central and Eastern Europe	CZ	**4,73**	▼ -0,27	▲ 0,65	▼ -0,74	**4,70**	▼ -0,02
Central and Eastern Europe	EE	**5,95**	▼ -0,91	▲ 0,17	▼ -0,26	**5,57**	▼ -0,38
Central and Eastern Europe	HU	**4,23**	▼ -0,91	▲ 3,20	▼ -0,26	**6,24**	▲ 2,01
Central and Eastern Europe	LV	**6,02**	▼ -0,62	▼ -0,59	▲ 0,25	**5,18**	▼ -0,84
Central and Eastern Europe	LT	**5,42**	▼ -0,69	▼ -1,04	▼ -0,62	**3,10**	▼ -2,32
Central and Eastern Europe	PL	**4,37**	▲ 1,69	▼ -1,52	▼ -0,23	**4,13**	▼ -0,24
Central and Eastern Europe	RO	**6,16**	▼ -0,68	▼ -0,30	.	**.**	.
Central and Eastern Europe	SK	**3,19**	▲ 0,52	▲ 2,65	▼ -2,77	**3,13**	▼ -0,06
Central and Eastern Europe	SI	**4,56**	▼ -0,50	▲ 0,70	▼ -0,93	**4,68**	▲ 0,12
Oceania	NZ	**3,95**	▼ -0,35	▲ 0,39	▲ 0,19	**4,36**	▲ 0,41
Oceania	AU	**3,21**	▲ 0,46	▼ -0,42	▲ 0,73	**3,90**	▲ 0,69
North America	CA	**3,74**	▲ 0,57	▼ -0,62	▼ -0,11	**3,48**	▼ -0,26
North America	US	**3,86**	▼ -0,02	▼ -0,63	▲ 0,10	**3,28**	▼ -0,59

Source: OECD

Table 2.3.2: Investment, Corporations (% of GDP), 2007 – 2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**14,67**	-0,51	0,53	1,68	**16,95**	2,28
Western Europe	BE	**14,77**	0,12	0,13	0,93	**15,60**	0,83
Western Europe	FR	**12,38**	-0,05	0,20	1,25	**14,23**	1,85
Western Europe	DE	**12,13**	-0,32	0,08	0,89	**12,43**	0,29
Western Europe	IE	**12,26**	-0,57	8,96	29,79	**19,59**	7,34
Western Europe	LU	**9,78**	0,83	-1,80	0,41	**8,31**	-1,47
Western Europe	NL	**11,72**	-0,74	2,66	-2,25	**10,97**	-0,74
Western Europe	CH	**19,59**	-1,45	0,98	0,58	**19,75**	0,16
Western Europe	UK	**10,84**	-1,88	1,38	0,28	**9,95**	-0,89
Northern Europe	DK	**12,91**	-2,49	1,86	1,24	**14,56**	1,65
Northern Europe	FI	**13,55**	-1,74	-0,47	1,05	**12,47**	-1,08
Northern Europe	IS	**17,96**	-7,66	.	.	**.**	.
Northern Europe	NO	**14,37**	-1,91	0,65	1,67	**12,41**	-1,96
Northern Europe	SE	**16,65**	-1,06	0,94	-0,23	**17,15**	0,50
Southern Europe	CY	**8,62**	-1,03	-1,39	1,56	**7,97**	-0,65
Southern Europe	EL	**7,83**	-2,63	-0,11	1,36	**7,26**	-0,57
Southern Europe	IT	**10,85**	-0,78	-0,69	1,21	**10,86**	0,00
Southern Europe	MT	**.**	.	.	.	**.**	.
Southern Europe	PT	**13,42**	-2,68	-0,65	2,30	**13,45**	0,04
Southern Europe	ES	**15,50**	-4,35	1,38	1,85	**12,67**	-2,83
Central and Eastern Europe	BG	**21,69**	-5,86	-2,22	.	**.**	.
Central and Eastern Europe	HR	**16,51**	-3,86	-0,03	0,31	**11,84**	-4,67
Central and Eastern Europe	CZ	**18,89**	-2,06	-0,14	0,93	**16,13**	-2,76
Central and Eastern Europe	EE	**22,31**	-4,50	-3,09	0,48	**17,90**	-4,41
Central and Eastern Europe	HU	**14,45**	-1,28	-0,69	3,94	**16,12**	1,67
Central and Eastern Europe	LV	**22,55**	-7,99	-1,11	0,88	**14,02**	-8,53
Central and Eastern Europe	LT	**19,45**	-9,06	1,34	2,20	**13,71**	-5,74
Central and Eastern Europe	PL	**12,49**	-3,13	1,64	0,00	**9,10**	-3,39
Central and Eastern Europe	RO	**23,16**	-6,96	-2,03	-1,54	**.**	.
Central and Eastern Europe	SK	**18,46**	-3,19	-1,56	-0,04	**11,33**	-7,13
Central and Eastern Europe	SI	**17,85**	-5,98	-1,53	1,56	**11,76**	-6,09
Oceania	NZ	**15,33**	-2,15	0,64	0,13	**13,78**	-1,55
Oceania	AU	**15,30**	1,10	-3,59	-1,67	**10,80**	-4,50
North America	CA	**11,20**	-0,08	0,45	-0,66	**10,64**	-0,57
North America	US	**11,05**	-0,91	1,09	0,12	**10,76**	-0,29

Source: OECD

Table 2.3.3: Investment, Households (% of GDP), 2007 – 2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**5,27**	0,03	-0,27	0,39	**6,04**	0,78
Western Europe	BE	**6,54**	-0,81	-0,27	0,27	**5,87**	-0,67
Western Europe	FR	**6,87**	-0,73	-0,57	0,48	**6,41**	-0,45
Western Europe	DE	**5,95**	0,29	-0,25	0,20	**6,74**	0,79
Western Europe	IE	**11,78**	-9,24	-0,83	-0,09	**1,65**	-10,12
Western Europe	LU	**5,36**	-0,94	0,22	-0,58	**4,19**	-1,17
Western Europe	NL	**7,75**	-2,67	-0,18	1,57	**7,15**	-0,60
Western Europe	CH	**4,98**	-0,56	-0,15	-0,48	**3,67**	-1,31
Western Europe	UK	**4,74**	-0,95	0,51	0,35	**4,26**	-0,48
Northern Europe	DK	**7,56**	-3,15	-0,48	0,55	**4,65**	-2,92
Northern Europe	FI	**7,16**	-0,12	-0,89	0,89	**7,00**	-0,16
Northern Europe	IS	**6,64**	-4,29	**-2,35**	.	**.**	.
Northern Europe	NO	**5,39**	-0,40	0,83	0,24	**5,64**	0,25
Northern Europe	SE	**3,44**	-0,49	0,12	0,16	**3,67**	0,23
Southern Europe	CY	**13,84**	-6,39	-2,99	4,22	**8,83**	-5,01
Southern Europe	EL	**13,33**	-7,35	-4,16	-0,07	**2,40**	-10,93
Southern Europe	IT	**7,64**	-0,91	-1,57	-0,07	**6,25**	-1,38
Southern Europe	MT	**.**	.	.	.	**.**	.
Southern Europe	PT	**5,87**	-1,68	-1,02	0,73	**4,29**	-1,58
Southern Europe	ES	**9,68**	-4,57	-2,23	0,58	**4,36**	-5,32
Central and Eastern Europe	BG	**1,38**	0,30	-0,92	.	**.**	.
Central and Eastern Europe	HR	**3,73**	-0,09	-0,52	0,91	**4,21**	0,48
Central and Eastern Europe	CZ	**6,33**	-0,87	-0,72	0,35	**5,17**	-1,16
Central and Eastern Europe	EE	**8,12**	-4,53	0,96	0,71	**5,41**	-2,72
Central and Eastern Europe	HU	**5,01**	-1,94	0,11	1,17	**4,83**	-0,17
Central and Eastern Europe	LV	**7,64**	-4,60	0,56	0,14	**3,06**	-4,58
Central and Eastern Europe	LT	**3,73**	-0,40	0,86	0,24	**4,57**	0,84
Central and Eastern Europe	PL	**5,61**	-0,55	-0,19	-1,28	**3,82**	-1,80
Central and Eastern Europe	RO	**6,02**	-0,46	-0,11	1,06	**.**	.
Central and Eastern Europe	SK	**3,78**	0,41	-0,60	0,64	**4,49**	0,70
Central and Eastern Europe	SI	**6,25**	-2,24	-0,46	0,28	**3,90**	-2,35
Oceania	NZ	**4,64**	-1,46	1,91	0,19	**5,70**	1,06
Oceania	AU	**9,73**	-2,36	1,93	-1,76	**8,23**	-1,49
North America	CA	**8,39**	-0,57	0,79	-0,51	**9,90**	1,51
North America	US	**7,41**	-2,67	1,26	0,31	**7,15**	-0,26

Source: OECD

Table 3.1: Population (inhabitants) 2007-2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**8295487**	96156	251056	237221	**8955797**	660310
Western Europe	BE	**10625700**	412564	235932	214784	**11592952**	967252
Western Europe	FR	**64021737**	1323496	1203039	839729	**67749632**	3727895
Western Europe	DE	**82266372**	-1991389	1411628	1406351	**83196078**	929706
Western Europe	IE	**4398942**	181142	121873	232383	**5033165**	634223
Western Europe	LU	**479993**	38354	51257	50397	**640064**	160071
Western Europe	NL	**16381696**	311378	246849	404951	**17533044**	1151348
Western Europe	CH	**7551117**	361281	369998	292884	**8703405**	1152288
Western Europe	UK	**61322463**	1936347	1857409	1720108	**67326569**	6004106
Northern Europe	DK	**5461438**	109134	112911	130939	**5856733**	395295
Northern Europe	FI	**5288720**	99552	91259	42075	**5541017**	252297
Northern Europe	IS	**311566**	7448	11801	29748	**372520**	60954
Northern Europe	NO	**4709153**	243935	235519	159289	**5408320**	699167
Northern Europe	SE	**9148092**	301121	349973	479701	**10415811**	1267719
Southern Europe	CY	**767000**	84000	-3000	34000	**900000**	133000
Southern Europe	EL	**11048473**	56426	-284016	-99301	**10641221**	-407252
Southern Europe	IT	**58438310**	941139	1351133	-1001501	**59109668**	671358
Southern Europe	MT	**406724**	9544	28785	59009	**518536**	111812
Southern Europe	PT	**10542964**	14596	-199484	-71813	**10325147**	-217817
Southern Europe	ES	**45226803**	1515894	-297865	690005	**47415750**	2188947
Central and Eastern Europe	BG	**7545338**	-197010	-170337	-202230	**6877743**	-667595
Central and Eastern Europe	HR	**4310217**	-29595	-77018	-138351	**3899000**	-411217
Central and Eastern Europe	CZ	**10298828**	197260	49971	125811	**10505772**	206944
Central and Eastern Europe	EE	**1340680**	-13241	-12032	11491	**1330932**	-9748
Central and Eastern Europe	HU	**10055780**	-84053	-128699	-71887	**9709891**	-345889
Central and Eastern Europe	LV	**2200325**	-140616	-82182	-63705	**1884490**	-315835
Central and Eastern Europe	LT	**3231294**	-203179	-123205	-110773	**2800839**	-430455
Central and Eastern Europe	PL	**38120560**	-57305	-76843	-20937	**37747124**	-373436
Central and Eastern Europe	RO	**20882982**	-735454	-331912	-443968	**19119880**	-1763102
Central and Eastern Europe	SK	**5374622**	23762	25417	30346	**5447247**	72625
Central and Eastern Europe	SI	**2018122**	34721	10688	24854	**2108079**	89957
Oceania	NZ	**4223800**	160200	225400	369800	**5122600**	898800
Oceania	AU	**20827622**	1512402	1475971	1524222	**25688079**	4860457
North America	CA	**32889025**	1450303	1363580	1898322	**38246108**	5357083
North America	US	**301231207**	10352274	9155513	7590959	**331893745**	30662538

Source: World Bank

Table 3 2: Population (inhabitants) and percentage change 2007-2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**8295487**	1,16	2,99	2,74	**8955797**	8,0
Western Europe	BE	**10625700**	3,88	2,14	1,91	**11592952**	9,1
Western Europe	FR	**64021737**	2,07	1,84	1,26	**67749632**	5,8
Western Europe	DE	**82266372**	-2,42	1,76	1,72	**83196078**	1,1
Western Europe	IE	**4398942**	4,12	2,66	4,94	**5033165**	14,4
Western Europe	LU	**479993**	7,99	9,89	8,85	**640064**	33,3
Western Europe	NL	**16381696**	1,90	1,48	2,39	**17533044**	7,0
Western Europe	CH	**7551117**	4,78	4,68	3,54	**8703405**	15,3
Western Europe	UK	**61322463**	3,16	2,94	2,64	**67326569**	9,8
Northern Europe	DK	**5461438**	2,00	2,03	2,30	**5856733**	7,2
Northern Europe	FI	**5288720**	1,88	1,69	0,77	**5541017**	4,8
Northern Europe	IS	**311566**	2,39	3,70	8,99	**372520**	19,6
Northern Europe	NO	**4709153**	5,18	4,75	3,07	**5408320**	14,8
Northern Europe	SE	**9148092**	3,29	3,70	4,90	**10415811**	13,9
Southern Europe	CY	**767000**	10,95	-0,35	4,01	**900000**	17,3
Southern Europe	EL	**11048473**	0,51	-2,56	-0,92	**10641221**	-3,7
Southern Europe	IT	**58438310**	1,61	2,28	-1,65	**59109668**	1,1
Southern Europe	MT	**406724**	2,35	6,92	13,26	**518536**	27,5
Southern Europe	PT	**10542964**	0,14	-1,89	-0,69	**10325147**	-2,1
Southern Europe	ES	**45226803**	3,35	-0,64	1,49	**47415750**	4,8
Central and Eastern Europe	BG	**7545338**	-2,61	-2,32	-2,82	**6877743**	-8,8
Central and Eastern Europe	HR	**4310217**	-0,69	-1,80	-3,29	**3899000**	-9,5
Central and Eastern Europe	CZ	**10298828**	1,92	0,48	1,19	**10505772**	2,0
Central and Eastern Europe	EE	**1340680**	-0,99	-0,91	0,87	**1330932**	-0,7
Central and Eastern Europe	HU	**10055780**	-0,84	-1,29	-0,73	**9709891**	-3,4
Central and Eastern Europe	LV	**2200325**	-6,39	-3,99	-3,22	**1884490**	-14,4
Central and Eastern Europe	LT	**3231294**	-6,29	-4,07	-3,81	**2800839**	-13,3
Central and Eastern Europe	PL	**38120560**	-0,15	-0,20	-0,06	**37747124**	-1,0
Central and Eastern Europe	RO	**20882982**	-3,52	-1,65	-2,24	**19119880**	-8,4
Central and Eastern Europe	SK	**5374622**	0,44	0,47	0,56	**5447247**	1,4
Central and Eastern Europe	SI	**2018122**	1,72	0,52	1,20	**2108079**	4,5
Oceania	NZ	**4223800**	3,79	5,14	8,02	**5122600**	21,3
Oceania	AU	**20827622**	7,26	6,61	6,40	**25688079**	23,3
North America	CA	**32889025**	4,41	3,97	5,32	**38246108**	16,3
North America	US	**301231207**	3,44	2,94	2,37	**331893745**	10,2

Source: World Bank

Table 4.1: GDP per capita, (US dollars 2015 PPPs), 2007-2021 WB-WDI

Region	Country	2007	2011		2015		2019	2021	Change	
Western Europe	AT	**43938**	▲	513	▼	-255	▲ 2451	**45238**	▲	1301
Western Europe	BE	**40290**	▼	-361	▲	1079	▲ 2090	**42901**	▲	2611
Western Europe	FR	**36465**	▼	-221	▲	409	▲ 2179	**38046**	▲	1581
Western Europe	DE	**37842**	▲	2135	▲	1126	▲ 2181	**42726**	▲	4884
Western Europe	IE	**52228**	▼	-5606	▲	15432	▲ 13185	**88967**	▲	36739
Western Europe	LU	**112418**	▼	-7128	▲	172	▲ 1267	**107792**	▼	-4626
Western Europe	NL	**45139**	▼	-269	▲	324	▲ 3250	**48302**	▲	3163
Western Europe	CH	**81254**	▲	620	▲	1932	▲ 3317	**87340**	▲	6086
Western Europe	UK	**44424**	▼	-1919	▲	2566	▲ 2421	**45102**	▲	678
Northern Europe	DK	**53936**	▼	-2291	▲	1610	▲ 3948	**58360**	▲	4424
Northern Europe	FI	**46213**	▼	-1746	▼	-1665	▲ 3334	**46297**	▲	85
Northern Europe	IS	**53646**	▼	-4713	▲	4018	▲ 4854	**54417**	▲	771
Northern Europe	NO	**75624**	▼	-3430	▲	2161	▲ 1650	**77513**	▲	1888
Northern Europe	SE	**49145**	▲	395	▲	2006	▲ 1945	**54262**	▲	5117
Southern Europe	CY	**27157**	▼	-1618	▼	-2052	▲ 4873	**28329**	▲	1173
Southern Europe	EL	**24073**	▼	-4672	▼	-1317	▲ 935	**18908**	▼	-5165
Southern Europe	IT	**34081**	▼	-1852	▼	-1987	▲ 1872	**31506**	▼	-2575
Southern Europe	MT	**19338**	▲	1228	▲	4355	▲ 3454	**27891**	▲	8553
Southern Europe	PT	**19951**	▼	-586	▼	-115	▲ 2367	**20831**	▲	880
Southern Europe	ES	**27218**	▼	-1816	▲	352	▲ 2334	**26126**	▼	-1093
Central and Eastern Europe	BG	**6049**	▲	556	▲	470	▲ 1160	**8634**	▲	2585
Central and Eastern Europe	HR	**12564**	▼	-745	▲	133	▲ 2120	**15166**	▲	2602
Central and Eastern Europe	CZ	**16739**	▲	23	▲	1068	▲ 2377	**20084**	▲	3345
Central and Eastern Europe	EE	**17459**	▼	-1766	▲	1709	▲ 2868	**21707**	▲	4248
Central and Eastern Europe	HU	**11793**	▼	-241	▲	1166	▲ 2366	**15519**	▲	3726
Central and Eastern Europe	LV	**13185**	▼	-1734	▲	2335	▲ 2283	**16610**	▲	3425
Central and Eastern Europe	LT	**11985**	▲	62	▲	2217	▲ 2986	**18234**	▲	6249
Central and Eastern Europe	PL	**9732**	▲	1560	▲	1268	▲ 2493	**15850**	▲	6119
Central and Eastern Europe	RO	**7481**	▲	562	▲	934	▲ 2276	**11542**	▲	4061
Central and Eastern Europe	SK	**13734**	▲	1220	▲	1436	▲ 1852	**18181**	▲	4447
Central and Eastern Europe	SI	**21575**	▼	-828	▲	143	▲ 3235	**24745**	▲	3170
Oceania	NZ	**36363**	▼	-447	▲	2715	▲ 1968	**40415**	▲	4053
Oceania	AU	**52588**	▲	1545	▲	2578	▲ 2160	**59341**	▲	6753
North America	CA	**42097**	▼	-60	▲	1559	▲ 1513	**43936**	▲	1839
North America	US	**54300**	▼	-905	▲	3368	▲ 3935	**61856**	▲	7556

Table 4.2: GDP per capita (US dollars), 2007 – 2021

Region	Country	2007	2011		2015		2019	2021	Change
Western Europe	AT	**39436**	▲	5033	▲	5473	▲ 9777	**59976**	▲ 20540
Western Europe	BE	**36794**	▲	4149	▲	5259	▲ 9599	**58806**	▲ 22012
Western Europe	FR	**34132**	▲	3316	▲	3382	▲ 9392	**50999**	▲ 16867
Western Europe	DE	**36863**	▲	5679	▲	5068	▲ 9787	**58784**	▲ 21921
Western Europe	IE	**46765**	▼	-1664	▲	24065	▲ 20680	**106852**	▲ 60087
Western Europe	LU	**84994**	▲	9285	▲	13619	▲ 11355	**131278**	▲ 46284
Western Europe	NL	**43943**	▲	2656	▲	3689	▲ 9920	**63419**	▲ 19476
Western Europe	CH	**50584**	▲	6910	▲	7771	▲ 7403	**75951**	▲ 25367
Western Europe	UK	**35548**	▲	1697	▲	5357	▲ 6716	**49765**	▲ 14217
Northern Europe	DK	**39021**	▲	5387	▲	4650	▲ 10826	**64898**	▲ 25877
Northern Europe	FI	**37843**	▲	3074	▲	1573	▲ 9321	**54890**	▲ 17047
Northern Europe	IS	**41490**	▼	-551	▲	8264	▲ 10791	**58297**	▲ 16807
Northern Europe	NO	**55939**	▲	6139	▼	-1725	▲ 8911	**80496**	▲ 24557
Northern Europe	SE	**40910**	▲	3699	▲	4494	▲ 7301	**59974**	▲ 19064
Southern Europe	CY	**32885**	▲	429	▼	-1499	▲ 11908	**43318**	▲ 10433
Southern Europe	EL	**29323**	▼	-3652	▲	1089	▲ 4396	**31177**	▲ 1854
Southern Europe	IT	**33960**	▲	2243	▲	1003	▲ 8594	**46528**	▲ 12568
Southern Europe	MT	**25061**	▲	3912	▲	8458	▲ 11242	**48726**	▲ 23665
Southern Europe	PT	**25736**	▲	1033	▲	2892	▲ 7638	**36715**	▲ 10979
Southern Europe	ES	**32467**	▼	-595	▲	3073	▲ 8191	**40724**	▲ 8257
Central and Eastern Europe	BG	**12621**	▲	3126	▲	2645	▲ 6778	**26793**	▲ 14172
Central and Eastern Europe	HR	**19528**	▲	1567	▲	2244	▲ 8250	**34535**	▲ 15007
Central and Eastern Europe	CZ	**26225**	▲	2775	▲	4909	▲ 10314	**44802**	▲ 18577
Central and Eastern Europe	EE	**22161**	▲	2354	▲	4708	▲ 9845	**43494**	▲ 21333
Central and Eastern Europe	HU	**19096**	▲	3933	▲	3770	▲ 7840	**36678**	▲ 17582
Central and Eastern Europe	LV	**18233**	▲	1024	▲	5718	▲ 7964	**35150**	▲ 16917
Central and Eastern Europe	LT	**19097**	▲	3788	▲	5949	▲ 11117	**43688**	▲ 24591
Central and Eastern Europe	PL	**16807**	▲	5579	▲	4110	▲ 8097	**37711**	▲ 20904
Central and Eastern Europe	RO	**13702**	▲	4194	▲	3703	▲ 11311	**35947**	▲ 22245
Central and Eastern Europe	SK	**21138**	▲	5122	▲	3802	▲ 3400	**33941**	▲ 12803
Central and Eastern Europe	SI	**27563**	▲	1368	▲	2701	▲ 10444	**43970**	▲ 16407
Oceania	NZ	**29274**	▲	3364	▲	4609	▲ 8373	**47045**	▲ 17771
Oceania	AU	**39687**	▲	4754	▲	2786	▲ 5505	**61977**	▲ 22290
North America	CA	**39575**	▲	2092	▲	3003	▲ 5162	**53074**	▲ 13499
North America	US	**47976**	▲	1976	▲	6569	▲ 8169	**70181**	▲ 22205

Table 5.1: GDP per person employed (US dollars 2017 PPPs per person), 2007 – 2021

Region	Country	2007	2011		2015		2019		2021		Change
Western Europe	AT	**109093**	▼	-1168	▼	-143	▲	3495	**110987**	▲	1894
Western Europe	BE	**117985**	▼	-610	▲	4729	▼	-630	**122316**	▲	4331
Western Europe	FR	**101499**	▲	777	▲	3237	▲	4716	**106500**	▲	5001
Western Europe	DE	**101338**	▲	297	▲	1070	▲	1308	**104314**	▲	2976
Western Europe	IE	**119223**	▲	11013	▲	32970	▲	20707	**219466**	▲	100243
Western Europe	LU	**275389**	▼	-25692	▼	-7364	▼	-4120	**233959**	▼	-41430
Western Europe	NL	**104240**	▼	-433	▲	2127	▲	1748	**104432**	▲	192
Western Europe	CH	**120222**	▲	1381	▲	1797	▲	4444	**131556**	▲	11334
Western Europe	UK	**90957**	▼	-1176	▲	2150	▲	2834	**91572**	▲	616
Northern Europe	DK	**103982**	▲	3324	▲	3478	▲	3923	**116888**	▲	12906
Northern Europe	FI	**102753**	▼	-1267	▼	-594	▲	3271	**103606**	▲	853
Northern Europe	IS	**89269**	▼	-1181	▲	239	▲	9456	**105368**	▲	16099
Northern Europe	NO	**122535**	▼	-3440	▲	4399	▲	2668	**125782**	▲	3247
Northern Europe	SE	**97855**	▲	2688	▲	3467	▲	3022	**110048**	▲	12193
Southern Europe	CY	**56738**	▲	307	▼	-1526	▲	5461	**61055**	▲	4318
Southern Europe	EL	**90597**	▼	-8507	▲	2616	▼	-4016	**79892**	▼	-10705
Southern Europe	IT	**115313**	▼	-2183	▼	-4984	▲	1276	**109899**	▼	-5414
Southern Europe	MT	**78913**	▲	1086	▲	7633	▲	772	**85607**	▲	6694
Southern Europe	PT	**66744**	▲	2954	▲	1017	▲	2274	**71990**	▲	5247
Southern Europe	ES	**86030**	▲	6497	▲	3544	▼	-86	**90168**	▲	4138
Central and Eastern Europe	BG	**40347**	▲	6158	▲	874	▲	2592	**53921**	▲	13574
Central and Eastern Europe	HR	**65153**	▼	-242	▲	1011	▲	5804	**77529**	▲	12376
Central and Eastern Europe	CZ	**71189**	▲	2060	▲	2413	▲	6680	**83689**	▲	12501
Central and Eastern Europe	EE	**63308**	▼	-1721	▲	1832	▲	7717	**78070**	▲	14762
Central and Eastern Europe	HU	**64559**	▲	345	▼	-1823	▲	6202	**69282**	▲	4723
Central and Eastern Europe	LV	**52431**	▲	180	▲	5240	▲	6266	**68510**	▲	16079
Central and Eastern Europe	LT	**57625**	▲	5098	▲	4204	▲	8212	**81012**	▲	23388
Central and Eastern Europe	PL	**52361**	▲	6032	▲	4248	▲	9376	**74890**	▲	22529
Central and Eastern Europe	RO	**46186**	▲	4562	▲	5134	▲	11541	**74042**	▲	27857
Central and Eastern Europe	SK	**54826**	▲	6212	▲	3224	▲	3226	**67280**	▲	12454
Central and Eastern Europe	SI	**71485**	▲	2170	▲	2429	▲	6861	**85252**	▲	13766
Oceania	NZ	**74317**	▲	1514	▲	3012	▲	129	**78770**	▲	4453
Oceania	AU	**87845**	▲	2394	▲	5808	▲	1032	**97742**	▲	9896
North America	CA	**87378**	▲	1477	▲	3711	▲	1845	**94229**	▲	6851
North America	US	**113114**	▲	6141	▲	4580	▲	4469	**135641**	▲	22527

Source: World Bank WDI

Table 5.2 GDP per person employed (US dollars 2015 PPPs per person) 2007 – 2021

Region	Country	2007	2011		2015		2019		2021		Change
Western Europe	AT	**102485**	▼	-1361	▼	-559	▲	2490	**100445**	▼	-2041
Western Europe	BE	**109783**	▼	-722	▲	3749	▲	1150	**112311**	▲	2528
Western Europe	FR	**96394**	▲	1195	▲	1659	▲	3102	**99036**	▲	2642
Western Europe	DE	**89540**	▼	-64	▲	712	▲	1823	**91538**	▲	1998
Western Europe	IE	**115272**	▲	10774	▲	32118	▲	20102	**208667**	▲	93396
Western Europe	LU	**165599**	▼	-14588	▲	597	▼	-5588	**145318**	▼	-20281
Western Europe	NL	**93800**	▲	322	▲	2595	▲	444	**96562**	▲	2762
Western Europe	CH	**109987**	▼	-256	▲	604	▲	3708	**115955**	▲	5968
Western Europe	UK	**87638**	▼	-1125	▲	2150	▲	2816	**88617**	▲	980
Northern Europe	DK	**93147**	▲	1931	▲	3454	▲	3385	**103349**	▲	10202
Northern Europe	FI	**96339**	▼	-2476	▼	-1595	▲	2311	**94428**	▼	-1912
Northern Europe	IS	**87201**	▲	1081	▲	1892	▲	5510	**96346**	▲	9145
Northern Europe	NO	**116874**	▼	-4013	▲	3429	▲	1157	**120849**	▲	3975
Northern Europe	SE	**95725**	▲	2485	▲	3044	▲	2086	**106721**	▲	10997
Southern Europe	CY	**.**		.		.		.	**.**		.
Southern Europe	EL	**82080**	▼	-11314	▼	-3776	▼	-3491	**62117**	▼	-19963
Southern Europe	IT	**96036**	▼	-2069	▼	-2560	▲	360	**90773**	▼	-5263
Southern Europe	MT	**.**		.		.		.	**.**		.
Southern Europe	PT	**64031**	▲	1918	▲	1193	▲	2035	**66810**	▲	2779
Southern Europe	ES	**78830**	▲	5855	▲	3025	▲	577	**84145**	▲	5315
Central and Eastern Europe	BG	**.**		.		.		.	**.**		.
Central and Eastern Europe	HR	**.**		.		.		.	**.**		.
Central and Eastern Europe	CZ	**64355**	▲	1969	▲	2667	▲	6510	**74882**	▲	10527
Central and Eastern Europe	EE	**60994**	▼	-1191	▲	1809	▲	7169	**75826**	▲	14832
Central and Eastern Europe	HU	**60572**	▲	919	▼	-329	▲	4705	**67394**	▲	6822
Central and Eastern Europe	LV	**49387**	▲	510	▲	5653	▲	6482	**66347**	▲	16960
Central and Eastern Europe	LT	**54126**	▲	4628	▲	3692	▲	7722	**74655**	▲	20529
Central and Eastern Europe	PL	**52273**	▲	7108	▲	4419	▲	10628	**75986**	▲	23713
Central and Eastern Europe	RO	**.**		.		.		.	**.**		.
Central and Eastern Europe	SK	**62174**	▲	4857	▲	4870	▲	2709	**76136**	▲	13962
Central and Eastern Europe	SI	**67534**	▲	540	▲	1074	▲	3783	**75006**	▲	7472
Oceania	NZ	**69050**	▲	929	▲	2986	▲	1722	**75559**	▲	6509
Oceania	AU	**86017**	▲	3385	▲	4328	▼	-241	**95392**	▲	9374
North America	CA	**83403**	▲	788	▲	3433	▲	1481	**90868**	▲	7465
North America	US	**110305**	▲	6715	▲	3551	▲	4204	**132657**	▲	22352

Source: OECD

Table 6: GDP per hour worked (US dollars 2015 per hour), 2007 – 2021

Region	Country	2007	2011		2015		2019		2021		Change
Western Europe	AT	**63,81**	▲	1,14	▲	2,32	▲	1,04	**69,63**	▲	5,82
Western Europe	BE	**68,89**	▼	-0,31	▲	3,02	▲	0,66	**73,61**	▲	4,72
Western Europe	FR	**62,72**	▲	0,39	▲	2,21	▲	2,10	**66,75**	▲	4,03
Western Europe	DE	**61,58**	▲	1,13	▲	1,67	▲	2,68	**68,30**	▲	6,72
Western Europe	IE	**64,00**	▲	11,55	▲	18,48	▲	8,30	**128,21**	▲	64,21
Western Europe	LU	**104,74**	▼	-5,36	▲	0,40	▼	-1,96	**99,03**	▼	-5,71
Western Europe	NL	**65,63**	▲	0,64	▲	1,56	▼	-0,41	**67,70**	▲	2,07
Western Europe	CH	**67,60**	▲	0,63	▲	1,75	▲	3,64	**75,91**	▲	8,31
Western Europe	UK	**56,86**	▲	0,23	▲	1,04	▲	1,39	**59,14**	▲	2,28
Northern Europe	DK	**65,01**	▲	1,16	▲	3,85	▲	4,30	**75,83**	▲	10,82
Northern Europe	FI	**60,02**	▼	-0,54	▼	-0,14	▲	2,14	**61,89**	▲	1,87
Northern Europe	IS	**56,12**	▲	1,29	▲	2,25	▲	4,98	**66,03**	▲	9,91
Northern Europe	NO	**80,74**	▼	-2,57	▲	2,85	▲	1,01	**84,46**	▲	3,72
Northern Europe	SE	**65,49**	▲	0,70	▲	2,88	▲	2,03	**73,67**	▲	8,18
Southern Europe	CY	**41,98**	▼	-0,85	▼	-0,95	▲	1,65	**42,23**	▲	0,25
Southern Europe	EL	**41,02**	▼	-4,73	▼	-1,67	▼	-1,49	**33,18**	▼	-7,84
Southern Europe	IT	**52,83**	▲	0,18	▲	0,21	▲	0,44	**54,59**	▲	1,76
Southern Europe	MT	**36,12**	▲	1,56	▲	5,54	▼	-1,82	**42,56**	▲	6,45
Southern Europe	PT	**36,49**	▲	1,76	▲	0,52	▲	0,90	**40,51**	▲	4,02
Southern Europe	ES	**46,34**	▲	3,16	▲	2,27	▲	0,86	**51,83**	▲	5,49
Central and Eastern Europe	BG	**19,23**	▲	2,55	▲	1,52	▲	2,39	**26,56**	▲	7,33
Central and Eastern Europe	HR	**31,96**	▼	-0,31	▲	2,69	▲	1,49	**36,36**	▲	4,40
Central and Eastern Europe	CZ	**36,26**	▲	0,47	▲	2,66	▲	2,88	**43,49**	▲	7,23
Central and Eastern Europe	EE	**32,05**	▲	0,68	▲	2,22	▲	5,64	**42,91**	▲	10,86
Central and Eastern Europe	HU	**33,88**	▲	1,18	▼	-0,03	▲	3,22	**39,93**	▲	6,05
Central and Eastern Europe	LV	**27,53**	▲	1,70	▲	4,17	▲	4,63	**41,44**	▲	13,91
Central and Eastern Europe	LT	**32,20**	▲	2,89	▲	2,23	▲	4,81	**46,08**	▲	13,88
Central and Eastern Europe	PL	**28,18**	▲	4,37	▲	2,33	▲	6,87	**41,52**	▲	13,34
Central and Eastern Europe	RO	**21,47**	▲	2,58	▲	4,07	▲	5,46	**37,51**	▲	16,04
Central and Eastern Europe	SK	**34,71**	▲	2,67	▲	3,61	▲	3,11	**48,09**	▲	13,38
Central and Eastern Europe	SI	**40,81**	▲	0,12	▲	0,05	▲	4,56	**47,08**	▲	6,27
Oceania	NZ	**38,86**	▲	1,19	▲	1,57	▲	0,28	**43,34**	▲	4,48
Oceania	AU	**47,87**	▲	2,60	▲	3,63	▲	1,11	**56,82**	▲	8,95
North America	CA	**47,80**	▲	1,38	▲	2,16	▲	1,66	**53,97**	▲	6,17
North America	US	**63,23**	▲	4,63	▲	1,19	▲	2,47	**74,84**	▲	11,61

Source: OECD & EUROSTAT for CY MT BG hr RO

Table 7: Hours worked to employed people (hours person), 2007 – 2021

Region	Country	2007	2011		2015		2019		2021	Change
Western Europe	AT	**1606**	▼	-49	▼	-62	▲	14	**1442**	▼ -164
Western Europe	BE	**1594**	▼	-3	▼	-15	▲	2	**1526**	▼ -68
Western Europe	FR	**1537**	▲	10	▼	-27	▼	-1	**1484**	▼ -53
Western Europe	DE	**1454**	▼	-27	▼	-26	▼	-29	**1340**	▼ -114
Western Europe	IE	**1745**	▼	-77	▲	14	▲	60	**1627**	▼ -118
Western Europe	LU	**1581**	▼	-61	▲	0	▼	-27	**1467**	▼ -114
Western Europe	NL	**1429**	▼	-9	▲	6	▲	15	**1426**	▼ -3
Western Europe	CH	**1627**	▼	-19	▼	-32	▼	-28	**1528**	▼ -100
Western Europe	UK	**1541**	▼	-26	▲	10	▲	12	**1497**	▼ -44
Northern Europe	DK	**1433**	▲	4	▼	-30	▼	-36	**1363**	▼ -70
Northern Europe	FI	**1605**	▼	-27	▼	-23	▼	-17	**1518**	▼ -87
Northern Europe	IS	**1554**	▼	-16	▼	-26	▼	-31	**1459**	▼ -95
Northern Europe	NO	**1438**	▼	-4	▼	-8	▼	-8	**1426**	▼ -13
Northern Europe	SE	**1462**	▲	22	▼	-18	▼	-12	**1444**	▼ -17
Southern Europe	CY	.		.		.		.	.	.
Southern Europe	EL	**2001**	▼	-51	▼	-15	▼	-18	**1872**	▼ -129
Southern Europe	IT	**1818**	▼	-45	▼	-55	▼	-7	**1658**	▼ -159
Southern Europe	MT	.		.		.		.	.	.
Southern Europe	PT	**1755**	▼	-30	▲	7	▲	12	**1649**	▼ -106
Southern Europe	ES	**1701**	▲	9	▼	-16	▼	-17	**1623**	▼ -78
Central and Eastern Europe	BG	.		.		.		.	.	.
Central and Eastern Europe	HR	.		.		.		.	.	.
Central and Eastern Europe	CZ	**1775**	▲	30	▼	-54	▲	35	**1722**	▼ -53
Central and Eastern Europe	EE	**1903**	▼	-76	▼	-64	▼	-69	**1767**	▼ -136
Central and Eastern Europe	HU	**1788**	▼	-34	▼	-8	▼	-24	**1688**	▼ -100
Central and Eastern Europe	LV	**1794**	▼	-87	▼	-44	▼	-32	**1601**	▼ -192
Central and Eastern Europe	LT	**1681**	▼	-7	▼	-1	▼	-8	**1620**	▼ -61
Central and Eastern Europe	PL	**1855**	▼	-30	▲	5	▼	-47	**1830**	▼ -24
Central and Eastern Europe	RO	.		.		.		.	.	.
Central and Eastern Europe	SK	**1791**	▲	2	▼	-39	▼	-62	**1583**	▼ -208
Central and Eastern Europe	SI	**1655**	▲	8	▲	24	▼	-86	**1593**	▼ -62
Oceania	NZ	**1774**	▼	-28	▲	7	▲	30	**1730**	▼ -44
Oceania	AU	**1797**	▼	-25	▼	-39	▼	-40	**1678**	▼ -118
North America	CA	**1745**	▼	-34	▼	-1	▼	-19	**1685**	▼ -60
North America	US	**1744**	▼	-20	▲	22	▼	-2	**1773**	▲ 28

Source: OECD

Table 8.1: Regulatory Quality (-2.5 weak; 2.5 strong) 2007-2021

Region	Country	2007	2011		2015		2019		2021	Change
Western Europe	AT	**1,69**	▼	-0,31	▲	0,02	▲	0,06	**1,35**	▼ -0,34
Western Europe	BE	**1,42**	▼	-0,18	▲	0,05	▲	0,01	**1,34**	▼ -0,08
Western Europe	FR	**1,29**	▼	-0,13	▼	-0,03	▲	0,31	**1,24**	▼ -0,05
Western Europe	DE	**1,62**	▼	-0,07	▲	0,17	▲	0,00	**1,63**	▲ 0,02
Western Europe	IE	**1,85**	▼	-0,26	▲	0,22	▼	-0,21	**1,56**	▼ -0,29
Western Europe	LU	**1,74**	▲	0,12	▼	-0,21	▲	0,05	**1,92**	▲ 0,18
Western Europe	NL	**1,80**	▲	0,00	▼	-0,01	▲	0,07	**1,75**	▼ -0,05
Western Europe	CH	**1,65**	▼	-0,03	▲	0,12	▼	-0,07	**1,73**	▲ 0,09
Western Europe	UK	**1,87**	▼	-0,22	▲	0,19	▼	-0,22	**1,47**	▼ -0,40
Northern Europe	DK	**1,93**	▼	-0,03	▼	-0,17	▼	-0,17	**1,81**	▼ -0,12
Northern Europe	FI	**1,55**	▲	0,26	▲	0,02	▲	0,02	**1,90**	▲ 0,35
Northern Europe	IS	**1,51**	▼	-0,46	▲	0,22	▲	0,10	**1,53**	▲ 0,02
Northern Europe	NO	**1,33**	▲	0,27	▲	0,00	▲	0,20	**1,64**	▲ 0,31
Northern Europe	SE	**1,57**	▲	0,32	▼	-0,08	▼	-0,01	**1,75**	▲ 0,18
Southern Europe	CY	**1,33**	▼	-0,10	▼	-0,17	▼	-0,05	**0,86**	▼ -0,47
Southern Europe	EL	**0,89**	▼	-0,40	▼	-0,09	▲	0,12	**0,44**	▼ -0,45
Southern Europe	IT	**0,94**	▼	-0,23	▲	0,01	▲	0,23	**0,55**	▼ -0,40
Southern Europe	MT	**1,14**	▲	0,19	▼	-0,17	▼	-0,21	**0,81**	▼ -0,33
Southern Europe	PT	**1,08**	▼	-0,46	▲	0,33	▲	0,02	**0,74**	▼ -0,35
Southern Europe	ES	**1,22**	▼	-0,15	▼	-0,26	▲	0,25	**0,81**	▼ -0,40
Central and Eastern Europe	BG	**0,64**	▼	-0,09	▲	0,04	▼	-0,05	**0,45**	▼ -0,20
Central and Eastern Europe	HR	**0,41**	▲	0,03	▼	-0,19	▲	0,31	**0,50**	▲ 0,09
Central and Eastern Europe	CZ	**1,05**	▲	0,14	▼	-0,10	▲	0,15	**1,35**	▲ 0,30
Central and Eastern Europe	EE	**1,32**	▲	0,06	▲	0,28	▼	-0,07	**1,56**	▲ 0,24
Central and Eastern Europe	HU	**1,21**	▼	-0,18	▼	-0,27	▼	-0,16	**0,50**	▼ -0,71
Central and Eastern Europe	LV	**0,95**	▲	0,00	▲	0,13	▲	0,11	**1,22**	▲ 0,27
Central and Eastern Europe	LT	**1,01**	▼	-0,08	▲	0,35	▼	-0,12	**1,28**	▲ 0,27
Central and Eastern Europe	PL	**0,77**	▲	0,19	▲	0,01	▲	0,06	**0,84**	▲ 0,07
Central and Eastern Europe	RO	**0,51**	▲	0,18	▼	-0,11	▼	-0,12	**0,31**	▼ -0,20
Central and Eastern Europe	SK	**0,97**	▲	0,03	▼	-0,22	▲	0,22	**0,87**	▼ -0,10
Central and Eastern Europe	SI	**0,80**	▼	-0,11	▼	-0,07	▲	0,38	**0,83**	▲ 0,03
Oceania	NZ	**1,72**	▲	0,25	▼	-0,05	▼	-0,04	**1,81**	▲ 0,09
Oceania	AU	**1,68**	▲	0,17	▼	-0,07	▲	0,09	**1,84**	▲ 0,15
North America	CA	**1,61**	▲	0,08	▲	0,03	▲	0,00	**1,62**	▲ 0,01
North America	US	**1,49**	▼	-0,04	▼	-0,20	▲	0,09	**1,45**	▼ -0,04

Source: World Bank

Table 8.2: Control Corruption (-2.5 weak; 2.5 strong) 2007-2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**2,00**	-0,53	0,04	0,05	**1,27**	-0,73
Western Europe	BE	**1,35**	0,17	-0,01	-0,03	**1,48**	0,14
Western Europe	FR	**1,46**	0,08	-0,25	0,00	**1,31**	-0,15
Western Europe	DE	**1,73**	0,02	0,07	0,09	**1,81**	0,09
Western Europe	IE	**1,74**	-0,18	0,15	-0,22	**1,65**	-0,09
Western Europe	LU	**1,96**	0,19	-0,06	0,01	**1,87**	-0,09
Western Europe	NL	**2,16**	-0,08	-0,21	0,03	**2,04**	-0,12
Western Europe	CH	**2,14**	-0,11	0,11	-0,15	**1,99**	-0,15
Western Europe	UK	**1,73**	-0,12	0,25	-0,09	**1,67**	-0,06
Northern Europe	DK	**2,43**	-0,04	-0,17	-0,07	**2,37**	-0,07
Northern Europe	FI	**2,39**	-0,20	0,06	-0,11	**2,27**	-0,12
Northern Europe	IS	**2,20**	-0,26	0,00	-0,23	**1,79**	-0,41
Northern Europe	NO	**1,98**	0,16	0,10	-0,17	**2,14**	0,16
Northern Europe	SE	**2,23**	-0,07	0,02	-0,06	**2,13**	-0,10
Southern Europe	CY	**1,07**	-0,21	0,14	-0,38	**0,39**	-0,68
Southern Europe	EL	**0,26**	-0,36	0,01	0,13	**0,21**	-0,05
Southern Europe	IT	**0,33**	-0,03	-0,24	0,21	**0,54**	0,21
Southern Europe	MT	**1,02**	-0,26	0,14	-0,66	**0,32**	-0,70
Southern Europe	PT	**1,03**	0,05	-0,16	-0,15	**0,77**	-0,26
Southern Europe	ES	**1,08**	0,08	-0,50	0,03	**0,74**	-0,34
Central and Eastern Europe	BG	**-0,23**	-0,04	-0,05	0,16	**-0,24**	0,00
Central and Eastern Europe	HR	**0,06**	-0,03	0,20	-0,15	**0,06**	0,00
Central and Eastern Europe	CZ	**0,32**	0,06	0,11	0,06	**0,64**	0,32
Central and Eastern Europe	EE	**0,97**	0,08	0,25	0,27	**1,54**	0,57
Central and Eastern Europe	HU	**0,60**	-0,26	-0,19	-0,09	**0,04**	-0,56
Central and Eastern Europe	LV	**0,34**	-0,06	0,18	0,04	**0,75**	0,41
Central and Eastern Europe	LT	**0,10**	0,22	0,29	0,08	**0,85**	0,75
Central and Eastern Europe	PL	**0,28**	0,28	0,16	-0,09	**0,57**	0,29
Central and Eastern Europe	RO	**-0,23**	-0,10	0,19	-0,07	**-0,04**	0,19
Central and Eastern Europe	SK	**0,30**	-0,07	-0,09	0,08	**0,24**	-0,06
Central and Eastern Europe	SI	**1,01**	-0,07	-0,17	0,15	**0,72**	-0,29
Oceania	NZ	**2,32**	-0,03	-0,02	-0,11	**2,20**	-0,12
Oceania	AU	**2,00**	0,04	-0,16	-0,06	**1,74**	-0,26
North America	CA	**1,99**	-0,02	-0,09	-0,12	**1,65**	-0,34
North America	US	**1,38**	-0,11	0,13	-0,18	**1,05**	-0,33

Source: World Bank

Table 8.3: Global Competitiveness Index (max 100), 2007-2019

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**74,66**	-1,25	-0,28	2,29	**75,41**	0,75
Western Europe	BE	**72,86**	1,42	0,01	0,16	**74,46**	1,60
Western Europe	FR	**74,01**	-0,59	-0,17	2,08	**75,33**	1,32
Western Europe	DE	**78,73**	-1,40	1,65	0,98	**79,96**	1,23
Western Europe	IE	**71,79**	-3,62	4,87	-0,17	**72,88**	1,08
Western Europe	LU	**69,70**	2,21	2,37	1,43	**75,71**	6,01
Western Europe	NL	**77,15**	0,17	1,31	2,41	**81,05**	3,90
Western Europe	CH	**80,25**	1,71	0,31	1,36	**83,64**	3,39
Western Europe	UK	**77,36**	-0,38	0,65	0,18	**77,80**	0,45
Northern Europe	DK	**79,34**	-2,18	-0,96	2,01	**78,21**	-1,13
Northern Europe	FI	**78,39**	-0,28	-0,23	1,01	**78,89**	0,50
Northern Europe	IS	**71,74**	-3,92	1,19	2,42	**71,43**	-0,31
Northern Europe	NO	**74,32**	-0,29	3,20	-0,90	**76,33**	2,01
Northern Europe	SE	**79,18**	1,00	-2,54	0,88	**78,52**	-0,66
Southern Europe	CY	**60,40**	1,95	-1,92	2,58	**63,00**	2,60
Southern Europe	EL	**58,25**	-2,32	1,56	0,69	**58,18**	-0,07
Southern Europe	IT	**62,26**	0,98	0,45	2,19	**65,88**	3,62
Southern Europe	MT	**60,08**	1,81	0,81	3,80	**66,51**	6,43
Southern Europe	PT	**63,96**	-1,04	1,63	1,43	**65,97**	2,02
Southern Europe	ES	**66,61**	-1,78	0,69	3,01	**68,54**	1,93
Central and Eastern Europe	BG	**56,12**	3,34	2,24	4,62	**66,33**	10,21
Central and Eastern Europe	HR	**60,03**	-1,72	-0,18	3,54	**61,67**	1,64
Central and Eastern Europe	CZ	**65,39**	-0,80	2,35	1,22	**68,16**	2,77
Central and Eastern Europe	EE	**67,78**	-1,81	1,69	1,77	**69,42**	1,64
Central and Eastern Europe	HU	**62,16**	0,15	-1,66	2,76	**63,41**	1,25
Central and Eastern Europe	LV	**62,95**	-2,32	2,96	1,35	**64,94**	1,99
Central and Eastern Europe	LT	**64,13**	-1,15	1,99	2,41	**67,39**	3,26
Central and Eastern Europe	PL	**61,18**	2,56	0,45	2,39	**66,57**	5,40
Central and Eastern Europe	RO	**56,74**	1,48	3,55	1,46	**63,23**	6,49
Central and Eastern Europe	SK	**63,53**	-3,70	0,45	2,08	**62,37**	-1,16
Central and Eastern Europe	SI	**64,00**	-2,57	-0,22	4,36	**65,56**	1,57
Oceania	NZ	**71,16**	-0,77	4,68	0,32	**75,38**	4,22
Oceania	AU	**73,87**	-0,87	0,55	1,15	**74,71**	0,83
North America	CA	**76,33**	-0,15	-0,35	0,20	**76,02**	-0,31
North America	US	**81,04**	-3,51	2,66	2,27	**82,46**	1,42

Source: WEF (2009)

Table 8.4: Happiness score or Subjective Well-being (Life Lader 1-10) 2007-2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**7,12**	0,35	-0,39	0,12	**7,08**	-0,04
Western Europe	BE	**7,22**	-0,11	-0,21	-0,13	**6,88**	-0,34
Western Europe	FR	**6,58**	0,38	-0,60	0,33	**6,66**	0,07
Western Europe	DE	**6,42**	0,20	0,42	.	**6,75**	0,34
Western Europe	IE	**7,14**	-0,14	-0,18	0,42	**6,83**	-0,32
Western Europe	LU	**.**	**7,10**	-0,40	0,70	**.**	.
Western Europe	NL	**7,45**	0,11	-0,24	0,10	**7,31**	-0,14
Western Europe	CH	**7,47**	0,10	0,12	.	**.**	.
Western Europe	UK	**6,80**	0,07	-0,35	0,64	**6,87**	0,07
Northern Europe	DK	**7,83**	-0,05	-0,27	0,18	**7,70**	-0,14
Northern Europe	FI	**7,67**	-0,32	0,09	0,33	**7,79**	0,12
Northern Europe	IS	**6,89**	0,70	-0,09	0,03	**7,56**	0,68
Northern Europe	NO	**7,42**	.	.	-0,16	**7,36**	-0,05
Northern Europe	SE	**7,24**	0,14	-0,09	0,11	**7,44**	0,20
Southern Europe	CY	**6,24**	0,45	-1,25	0,70	**6,27**	0,03
Southern Europe	EL	**6,65**	-1,27	0,25	0,33	**6,10**	-0,54
Southern Europe	IT	**6,57**	-0,52	-0,21	0,60	**6,47**	-0,11
Southern Europe	MT	**.**	**6,15**	0,46	0,12	**6,44**	0,29
Southern Europe	PT	**5,41**	-0,19	-0,14	1,01	**6,18**	0,78
Southern Europe	ES	**6,99**	-0,48	-0,14	0,08	**6,47**	-0,53
Central and Eastern Europe	BG	**3,84**	0,03	0,99	0,24	**5,42**	1,58
Central and Eastern Europe	HR	**5,82**	-0,44	-0,18	0,42	**6,29**	0,47
Central and Eastern Europe	CZ	**6,50**	-0,17	0,28	-6,61	**6,94**	0,44
Central and Eastern Europe	EE	**5,33**	0,15	0,14	0,41	**6,55**	1,22
Central and Eastern Europe	HU	**4,95**	-0,04	0,43	0,66	**6,23**	1,27
Central and Eastern Europe	LV	**4,67**	0,30	0,91	0,09	**6,35**	1,69
Central and Eastern Europe	LT	**5,81**	-0,38	0,28	0,35	**6,86**	1,06
Central and Eastern Europe	PL	**5,89**	-0,24	0,36	0,24	**5,98**	0,09
Central and Eastern Europe	RO	**5,39**	-0,37	0,75	0,35	**6,55**	1,16
Central and Eastern Europe	SK	**5,26**	0,68	0,22	0,08	**6,42**	1,15
Central and Eastern Europe	SI	**5,81**	0,22	-0,30	0,92	**6,76**	0,95
Oceania	NZ	**7,60**	-0,41	0,23	-0,21	**7,14**	-0,47
Oceania	AU	**7,29**	0,12	-0,10	-0,08	**7,11**	-0,17
North America	CA	**7,48**	-0,06	-0,01	-0,30	**6,94**	-0,54
North America	US	**7,51**	-0,40	-0,25	0,08	**6,96**	-0,55

Source: Helliwell, J. F., Layard, R., Sachs, J. D., De Neve, J.-E., Aknin, L. B., & Wang, S. (Eds.). (2022). World Happiness Report 2022.

Table 9.1: Investment in Other buildings and infrastructures (% of GDP), 2007 – 2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**6,87**	-0,62	0,07	0,39	**7,20**	0,33
Western Europe	BE	**4,38**	0,92	-0,27	0,50	**5,39**	1,02
Western Europe	FR	**6,51**	-0,15	-0,71	0,40	**6,01**	-0,50
Western Europe	DE	**3,87**	0,34	-0,38	0,23	**4,39**	0,52
Western Europe	IE	**7,53**	-4,09	0,49	0,98	**3,97**	-3,55
Western Europe	LU	**7,14**	1,49	-2,67	0,55	**6,52**	-0,62
Western Europe	NL	**5,83**	0,11	-0,68	0,34	**5,78**	-0,05
Western Europe	CH	**4,27**	0,07	0,40	-0,16	**4,35**	0,09
Western Europe	UK	**6,38**	-1,41	1,05	0,14	**5,51**	-0,87
Northern Europe	DK	**5,26**	-0,98	0,73	0,14	**5,34**	0,08
Northern Europe	FI	**7,27**	-0,89	-0,18	1,20	**7,10**	-0,17
Northern Europe	IS	**13,96**	-9,23	1,22	1,50	**6,49**	-7,47
Northern Europe	NO	**10,35**	-1,12	1,92	-0,14	**9,25**	-1,09
Northern Europe	SE	**5,29**	-0,30	0,19	0,96	**5,68**	0,39
Southern Europe	CY	**6,50**	-0,70	-2,80	1,00	**4,90**	-1,60
Southern Europe	EL	**3,82**	-0,39	0,27	-0,99	**3,11**	-0,72
Southern Europe	IT	**5,81**	-0,61	-1,40	0,19	**4,68**	-1,13
Southern Europe	MT	**5,20**	0,40	2,30	-2,50	**5,40**	0,20
Southern Europe	PT	**8,00**	-0,47	-2,27	0,92	**7,16**	-0,84
Southern Europe	ES	**8,79**	-2,72	-1,42	-0,02	**4,54**	-4,25
Central and Eastern Europe	BG	**7,90**	0,60	0,20	-3,70	**3,90**	-4,00
Central and Eastern Europe	HR	**11,20**	-2,90	-0,70	0,60	**7,90**	-3,30
Central and Eastern Europe	CZ	**8,90**	-0,99	-1,02	-0,16	**6,44**	-2,46
Central and Eastern Europe	EE	**15,26**	-3,41	-2,60	0,13	**7,87**	-7,39
Central and Eastern Europe	HU	**7,58**	-0,64	0,98	2,53	**9,94**	2,36
Central and Eastern Europe	LV	**13,06**	-2,83	-0,41	-0,25	**8,27**	-4,78
Central and Eastern Europe	LT	**14,53**	-5,97	-0,41	0,54	**8,17**	-6,36
Central and Eastern Europe	PL	**8,16**	0,83	-0,73	-0,53	**6,86**	-1,30
Central and Eastern Europe	RO	**16,10**	-4,60	-0,80	-0,10	**12,70**	-3,40
Central and Eastern Europe	SK	**10,04**	-3,01	0,71	-2,36	**5,23**	-4,81
Central and Eastern Europe	SI	**10,65**	-4,38	0,09	-0,15	**6,36**	-4,30
Oceania	NZ	**6,81**	-0,82	-0,21	0,75	**6,25**	-0,56
Oceania	AU	**9,51**	2,31	-2,28	-0,83	**8,13**	-1,38
North America	CA	**7,33**	1,66	0,20	-1,44	**7,47**	0,14
North America	US	**5,47**	-1,00	0,34	0,00	**4,11**	-1,36

Source: OECD

Table 9.2: Investment in Transport equipment (% of GDP), 2007 – 2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**2,14**	-0,05	-0,36	0,47	**1,97**	-0,18
Western Europe	BE	**2,39**	-0,27	-0,01	0,12	**2,26**	-0,13
Western Europe	FR	**1,61**	-0,16	0,08	0,23	**1,64**	0,03
Western Europe	DE	**2,21**	-0,18	-0,11	0,33	**1,79**	-0,43
Western Europe	IE	**4,04**	0,28	-0,92	2,19	**3,26**	-0,78
Western Europe	LU	**3,63**	0,46	-0,10	-0,71	**3,13**	-0,51
Western Europe	NL	**1,29**	-0,02	0,28	0,43	**1,13**	-0,16
Western Europe	CH	**1,89**	-0,01	-0,24	0,32	**1,84**	-0,05
Western Europe	UK	**1,08**	-0,20	0,35	-0,36	**0,96**	-0,12
Northern Europe	DK	**2,52**	-1,06	0,90	-0,28	**1,92**	-0,59
Northern Europe	FI	**1,33**	-0,25	-0,07	-0,10	**0,55**	-0,78
Northern Europe	IS	**0,46**	0,83	2,46	-2,15	**2,40**	1,94
Northern Europe	NO	**2,01**	-0,29	-0,94	1,48	**1,58**	-0,43
Northern Europe	SE	**1,69**	-0,17	0,20	-0,04	**1,40**	-0,29
Southern Europe	CY	**1,60**	-0,40	-0,60	0,60	**0,50**	-1,10
Southern Europe	EL	**5,16**	-4,51	0,33	0,15	**1,04**	-4,12
Southern Europe	IT	**1,51**	-0,27	-0,21	0,34	**1,11**	-0,40
Southern Europe	MT	**0,80**	0,50	3,50	-3,50	**1,00**	0,20
Southern Europe	PT	**2,02**	-1,02	0,20	0,39	**1,29**	-0,73
Southern Europe	ES	**2,40**	-0,89	0,46	0,01	**1,51**	-0,90
Central and Eastern Europe	BG	**5,30**	-4,40	0,50	-0,10	**1,10**	-4,20
Central and Eastern Europe	HR	**2,70**	-1,20	-0,20	0,70	**1,70**	-1,00
Central and Eastern Europe	CZ	**3,66**	-1,06	-0,06	0,00	**2,24**	-1,42
Central and Eastern Europe	EE	**5,44**	-2,01	-0,94	-0,50	**2,35**	-3,09
Central and Eastern Europe	HU	**2,14**	-0,55	0,92	0,19	**2,96**	0,82
Central and Eastern Europe	LV	**4,96**	-2,72	-0,20	-0,36	**1,54**	-3,42
Central and Eastern Europe	LT	**3,11**	-1,23	0,16	0,69	**2,34**	-0,77
Central and Eastern Europe	PL	**2,20**	-0,54	0,25	0,01	**1,35**	-0,85
Central and Eastern Europe	RO	**5,60**	-1,40	-1,00	-0,90	**2,70**	-2,90
Central and Eastern Europe	SK	**1,66**	0,29	0,42	0,39	**2,20**	0,53
Central and Eastern Europe	SI	**3,28**	-1,56	0,09	0,15	**1,96**	-1,32
Oceania	NZ	**2,18**	-0,53	0,54	-0,42	**1,68**	-0,50
Oceania	AU	**2,46**	-0,68	-0,09	-0,30	**1,43**	-1,04
North America	CA	**1,15**	-0,29	-0,07	0,38	**0,72**	-0,43
North America	US	**1,61**	-0,15	0,49	-0,24	**1,21**	-0,40

Source: OECD

Table 9.3: Investment in Dwellings (% of GDP), 2007 – 2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**4,33**	0,05	-0,12	0,44	**5,26**	0,93
Western Europe	BE	**6,31**	-0,47	-0,14	0,41	**6,27**	-0,04
Western Europe	FR	**6,73**	-0,36	-0,51	0,58	**6,87**	0,13
Western Europe	DE	**5,19**	0,45	0,16	0,61	**7,18**	1,98
Western Europe	IE	**11,11**	-9,12	-0,52	0,82	**2,10**	-9,01
Western Europe	LU	**3,94**	-1,11	0,99	0,17	**3,27**	-0,67
Western Europe	NL	**6,24**	-2,01	-0,73	1,55	**5,48**	-0,76
Western Europe	CH	**4,42**	0,52	0,21	-0,47	**4,60**	0,18
Western Europe	UK	**4,00**	-0,86	0,33	0,67	**4,16**	0,16
Northern Europe	DK	**6,50**	-2,19	-0,30	1,14	**6,02**	-0,49
Northern Europe	FI	**6,52**	0,07	-0,60	1,04	**7,00**	0,48
Northern Europe	IS	**6,53**	-4,27	0,29	3,08	**5,53**	-1,00
Northern Europe	NO	**4,57**	-0,22	0,98	0,19	**5,19**	0,62
Northern Europe	SE	**4,42**	-0,45	0,76	-0,03	**5,22**	0,80
Southern Europe	CY	.	.	.	.	.	.
Southern Europe	EL	**10,83**	-5,93	-4,13	0,05	**1,28**	-9,55
Southern Europe	IT	**5,78**	-0,59	-1,07	-0,11	**5,17**	-0,61
Southern Europe	MT	.	.	.	.	.	.
Southern Europe	PT	**5,23**	-1,96	-0,82	0,77	**3,84**	-1,39
Southern Europe	ES	**11,39**	-6,00	-1,36	1,72	**5,44**	-5,95
Central and Eastern Europe	BG	.	.	.	.	.	.
Central and Eastern Europe	HR	.	.	.	.	.	.
Central and Eastern Europe	CZ	**4,85**	-0,68	-0,37	0,56	**4,67**	-0,18
Central and Eastern Europe	EE	**6,04**	-3,33	1,29	0,90	**4,88**	-1,16
Central and Eastern Europe	HU	**3,97**	-1,77	-0,03	1,03	**3,89**	-0,08
Central and Eastern Europe	LV	**7,16**	-5,20	0,47	0,28	**2,17**	-4,99
Central and Eastern Europe	LT	**2,80**	-0,83	0,85	0,22	**3,05**	0,25
Central and Eastern Europe	PL	**3,66**	-0,70	-0,35	-0,56	**2,32**	-1,34
Central and Eastern Europe	RO	.	.	.	.	.	.
Central and Eastern Europe	SK	**2,79**	-0,01	-0,26	0,81	**3,95**	1,16
Central and Eastern Europe	SI	**4,18**	-1,40	-0,64	0,04	**2,42**	-1,75
Oceania	NZ	**6,35**	-1,91	2,51	0,24	**7,76**	1,41
Oceania	AU	**5,56**	-0,81	1,31	-0,86	**5,37**	-0,19
North America	CA	**7,10**	-0,35	0,64	0,06	**9,91**	2,81
North America	US	**4,78**	-2,35	1,02	0,33	**4,72**	-0,06

Source: OECD

Table 10.1: Road infrastructure investment (% of GDP), 2007 – 2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**0,306**	-0,209	0,034	0,009	**0,118**	-0,188
Western Europe	BE	**0,048**	0,018	0,121	-0,033	**0,261**	0,213
Western Europe	FR	**0,715**	-0,103	-0,157	-0,028	**0,406**	-0,309
Western Europe	DE	**0,434**	0,022	-0,079	0,105	**0,457**	0,023
Western Europe	IE	**1,112**	-0,519	-0,360	0,002	.	.
Western Europe	LU	**0,418**	0,083	-0,083	-0,001	.	.
Western Europe	NL	**0,271**	0,080	.	.	.	.
Western Europe	CH	**0,746**	-0,004	-0,067	-0,008	.	.
Western Europe	UK	**0,275**	0,016	0,053	0,035	.	.
Northern Europe	DK	**0,441**	-0,016	-0,026	.	.	.
Northern Europe	FI	**0,429**	0,063	0,097	0,047	**0,547**	0,118
Northern Europe	IS	**1,179**	-0,825	0,073	-0,013	**0,482**	-0,697
Northern Europe	NO	**0,592**	0,193	0,238	0,097	.	.
Northern Europe	SE	**0,396**	0,066	-0,054	0,116	**0,542**	0,145
Southern Europe	CY	.	.	.	.	.	.
Southern Europe	EL	**0,651**	-0,094	0,208	-0,361	**0,402**	-0,249
Southern Europe	IT	**0,846**	-0,596	0,061	-0,071	.	.
Southern Europe	MT	**0,447**	-0,197	.	.	.	.
Southern Europe	PT	**0,828**	.	.	.	.	.
Southern Europe	ES	**0,751**	-0,190	-0,166	-0,118	**0,328**	-0,423
Central and Eastern Europe	BG	**0,657**	0,577	0,598	-0,973	**0,214**	-0,443
Central and Eastern Europe	HR	**2,404**	-1,382	-0,496	0,111	**0,922**	-1,483
Central and Eastern Europe	CZ	**1,074**	-0,291	-0,261	0,091	**0,763**	-0,311
Central and Eastern Europe	EE	**0,768**	0,179	-0,050	-0,105	**0,894**	0,125
Central and Eastern Europe	HU	**0,631**	-0,339	0,814	0,456	**1,232**	0,601
Central and Eastern Europe	LV	**1,017**	0,106	-0,297	-0,099	**0,597**	-0,421
Central and Eastern Europe	LT	**1,075**	0,020	-0,404	0,029	**0,773**	-0,303
Central and Eastern Europe	PL	**1,097**	1,109	-1,702	-0,051	**0,551**	-0,546
Central and Eastern Europe	RO	**2,199**	0,172	-0,580	.	.	.
Central and Eastern Europe	SK	**0,823**	-0,221	0,813	.	**1,130**	0,306
Central and Eastern Europe	SI	**1,899**	-1,597	0,071	0,257	**0,573**	-1,326
Oceania	NZ	**0,482**	0,277	-0,115	-0,098	**0,479**	-0,003
Oceania	AU	**1,175**	0,060	-0,296	0,164	**1,005**	-0,169
North America	CA	**0,727**	0,442	-0,654	-0,029	.	.
North America	US	**0,542**	-0,012	-0,041	0,014	**0,466**	-0,076

Source: OECD

Table 10.2: Railway infrastructure investment (% of GDP), 2007 – 2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**0,530**	▲ 0,161	▼ -0,241	▼ -0,013	**0,554**	▲ 0,024
Western Europe	BE	**0,239**	▲ 0,106	▼ -0,103	▼ -0,054	**0,226**	▼ -0,012
Western Europe	FR	**0,238**	▲ 0,105	▲ 0,057	▲ 0,073	**0,462**	▲ 0,224
Western Europe	DE	**0,153**	▼ -0,002	▲ 0,075	▲ 0,020	**0,280**	▲ 0,126
Western Europe	IE	**0,127**	▼ -0,044	▼ -0,059	.	**.**	.
Western Europe	LU	**0,368**	▼ -0,029	▲ 0,174	▼ -0,136	**.**	.
Western Europe	NL	**0,136**	▲ 0,038	.	.	**.**	.
Western Europe	CH	**0,649**	▲ 0,012	▲ 0,008	▼ -0,137	**0,542**	▼ -0,108
Western Europe	UK	**0,342**	▲ 0,050	▲ 0,161	▼ -0,033	**.**	.
Northern Europe	DK	**0,099**	▲ 0,249	▲ 0,131	.	**.**	.
Northern Europe	FI	**0,113**	▲ 0,067	▲ 0,089	▼ -0,076	**0,241**	▲ 0,128
Northern Europe	IS	**.**	.	.	.	**.**	.
Northern Europe	NO	**0,106**	▲ 0,051	▲ 0,212	▲ 0,057	**.**	.
Northern Europe	SE	**0,403**	▼ -0,018	▼ -0,027	▼ -0,003	**0,422**	▲ 0,019
Southern Europe	CY	**.**	.	.	.	**.**	.
Southern Europe	EL	**0,139**	▼ -0,058	▲ 0,114	▼ -0,141	**0,027**	▼ -0,112
Southern Europe	IT	**0,477**	▼ -0,206	▼ -0,098	▲ 0,063	**.**	.
Southern Europe	MT	**.**	.	.	.	**.**	.
Southern Europe	PT	**0,187**	▲ 0,002	▼ -0,091	▲ 0,002	**0,143**	▼ -0,044
Southern Europe	ES	**0,776**	▼ -0,066	▼ -0,468	▼ -0,064	**0,209**	▼ -0,567
Central and Eastern Europe	BG	**0,137**	▲ 0,080	▲ 0,440	▼ -0,456	**0,234**	▲ 0,097
Central and Eastern Europe	HR	**0,208**	▼ -0,031	▼ -0,044	▲ 0,098	**0,241**	▲ 0,033
Central and Eastern Europe	CZ	**0,441**	▼ -0,170	▲ 0,417	▼ -0,349	**0,608**	▲ 0,168
Central and Eastern Europe	EE	**0,183**	▲ 0,381	▼ -0,500	▲ 0,050	**0,191**	▲ 0,008
Central and Eastern Europe	HU	**0,368**	▼ -0,026	▲ 0,280	▼ -0,021	**0,420**	▲ 0,052
Central and Eastern Europe	LV	**0,159**	▲ 0,110	▲ 0,582	▼ -0,764	**0,248**	▲ 0,090
Central and Eastern Europe	LT	**0,262**	▲ 0,108	▲ 0,112	▼ -0,306	**0,194**	▼ -0,068
Central and Eastern Europe	PL	**0,206**	▲ 0,039	▼ -0,166	▲ 0,044	**0,119**	▼ -0,087
Central and Eastern Europe	RO	**0,244**	▼ -0,127	▲ 0,084	.	**.**	.
Central and Eastern Europe	SK	**0,454**	▼ -0,052	▼ -0,034	.	**0,223**	▼ -0,231
Central and Eastern Europe	SI	**0,177**	▲ 0,109	▲ 0,682	▼ -0,539	**0,722**	▲ 0,545
Oceania	NZ	**0,059**	▲ 0,129	▲ 0,002	▼ -0,107	**0,078**	▲ 0,018
Oceania	AU	**0,246**	▲ 0,187	▼ -0,111	▲ 0,085	**0,511**	▲ 0,264
North America	CA	**0,060**	▲ 0,007	▲ 0,008	▲ 0,012	**.**	.
North America	US	**0,063**	▲ 0,011	▲ 0,021	▼ -0,035	**0,044**	▼ -0,019

Table 10.3: Maritime port infrastructure investment (% of GDP), 2007 – 2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	.	.	.	.	.	.
Western Europe	BE	**0,046**	0,018	-0,038	0,015	**0,045**	-0,001
Western Europe	FR	**0,016**	-0,005	0,004	-0,002	**0,017**	0,001
Western Europe	DE	**0,026**	0,009	-0,019	-0,001	**0,012**	-0,014
Western Europe	IE	**0,015**	-0,006	-0,005	-0,001	.	.
Western Europe	LU	.	.	.	.	.	.
Western Europe	NL	.	.	.	.	.	.
Western Europe	CH	.	.	.	.	.	.
Western Europe	UK	.	.	.	.	.	.
Northern Europe	DK	**0,029**	-0,004	0,002	.	.	.
Northern Europe	FI	**0,118**	-0,079	-0,013	0,010	**0,031**	-0,087
Northern Europe	IS	**0,232**	-0,078	-0,028	0,044	**0,138**	-0,094
Northern Europe	NO	**0,042**	-0,040	0,001	0,024	.	.
Northern Europe	SE	**0,022**	-0,001	-0,004	0,027	.	.
Southern Europe	CY	.	.	.	.	.	.
Southern Europe	EL	**0,028**	-0,018	0,002	-0,007	**0,006**	-0,022
Southern Europe	IT	**0,073**	0,004	-0,013	-0,002	.	.
Southern Europe	MT	.	.	.	.	.	.
Southern Europe	PT	**0,089**	-0,042	.	.	.	.
Southern Europe	ES	**0,239**	-0,071	-0,084	-0,009	**0,107**	-0,133
Central and Eastern Europe	BG	**0,142**	-0,131	0,011	0,158	**0,127**	-0,014
Central and Eastern Europe	HR	**0,039**	0,098	.	.	.	.
Central and Eastern Europe	CZ	.	.	.	.	.	.
Central and Eastern Europe	EE	**0,348**	-0,240	-0,049	-0,041	**0,003**	-0,344
Central and Eastern Europe	HU	.	.	.	.	.	.
Central and Eastern Europe	LV	**0,625**	.	.	.	.	.
Central and Eastern Europe	LT	**0,090**	-0,003	-0,041	0,114	**0,070**	-0,020
Central and Eastern Europe	PL	**0,006**	0,011	-0,017	0,046	**0,064**	0,058
Central and Eastern Europe	RO	.	.	.	.	.	.
Central and Eastern Europe	SK	.	.	.	.	.	.
Central and Eastern Europe	SI	**0,020**	-0,004	0,025	-0,012	**0,075**	0,055
Oceania	NZ	.	.	0,094	0,015	.	.
Oceania	AU	**0,140**	0,263	-0,325	-0,022	**0,065**	-0,075
North America	CA	**0,016**	0,003	0,031	0,011	.	.
North America	US	.	.	.	.	.	.

Table 10.4: Airport infrastructure investment (% of GDP), 2007 – 2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**0,066**	.	.	.	**.**	.
Western Europe	BE	**0,039**	▼ -0,030	▲ 0,021	▼ -0,003	**0,019**	▼ -0,020
Western Europe	FR	**0,054**	▼ -0,008	▼ -0,023	▲ 0,019	**0,018**	▼ -0,037
Western Europe	DE	**0,065**	▲ 0,003	▼ -0,039	▲ 0,028	**0,038**	▼ -0,027
Western Europe	IE	**0,138**	▼ -0,089	▼ -0,008	▲ 0,029	**.**	.
Western Europe	LU	**0,171**	▼ -0,142	▼ -0,025	▲ 0,013	**.**	.
Western Europe	NL	**.**	.	.	.	**.**	.
Western Europe	CH		**0,064**	▼ -0,029	▲ 0,051	**0,043**	.
Western Europe	UK	**.**	.	.	.	**.**	.
Northern Europe	DK	**0,027**	▼ -0,015	▼ -0,009	.	**.**	.
Northern Europe	FI	**0,040**	▼ -0,017	▲ 0,015	▲ 0,089	**0,064**	▲ 0,024
Northern Europe	IS	**0,032**	▼ -0,017	▼ -0,012	▲ 0,004	**0,007**	▼ -0,025
Northern Europe	NO	**0,081**	▼ -0,037	▲ 0,032	▲ 0,016	**.**	.
Northern Europe	SE	**0,033**	▼ -0,002	▼ -0,002	▲ 0,050	**0,041**	▲ 0,008
Southern Europe	CY	**.**	.	.	.	**.**	.
Southern Europe	EL	**0,016**	▲ 0,006	▲ 0,004	▼ -0,014	**0,009**	▼ -0,007
Southern Europe	IT	**0,008**	▲ 0,003	▼ -0,002	▼ -0,007	**.**	.
Southern Europe	MT	**.**	.	.	.	**.**	.
Southern Europe	PT	**0,047**	▲ 0,011	▼ -0,013	▼ -0,009	**0,020**	▼ -0,027
Southern Europe	ES	**0,201**	▼ -0,085	▼ -0,089	▲ 0,024	**0,067**	▼ -0,134
Central and Eastern Europe	BG	**0,106**	▼ -0,011	▼ -0,085	▼ -0,002	**0,003**	▼ -0,103
Central and Eastern Europe	HR	**0,045**	▼ -0,004	▲ 0,268	▼ -0,103	**0,010**	▼ -0,035
Central and Eastern Europe	CZ	**0,055**	▼ -0,031	▼ -0,003	▲ 0,051	**0,002**	▼ -0,053
Central and Eastern Europe	EE	**0,189**	▼ -0,153	▼ -0,036	▲ 0,050	**0,073**	▼ -0,116
Central and Eastern Europe	HU	**0,002**	▲ 0,035	▼ -0,028	▲ 0,061	**0,032**	▲ 0,030
Central and Eastern Europe	LV	**0,070**	▼ -0,040	▲ 0,141	▼ -0,106	**0,018**	▼ -0,053
Central and Eastern Europe	LT	**0,183**	▼ -0,138	▼ -0,029	▲ 0,027	**0,062**	▼ -0,120
Central and Eastern Europe	PL	**0,027**	▲ 0,027	▲ 0,016	▼ -0,042	**0,032**	▲ 0,005
Central and Eastern Europe	RO	**0,033**	▼ -0,031	▲ 0,023	.	**.**	.
Central and Eastern Europe	SK	**0,025**	▲ 0,021	▼ -0,041	▼ -0,005	**0,004**	▼ -0,021
Central and Eastern Europe	SI	**0,068**	▼ -0,060	▼ -0,006	▲ 0,002	**0,019**	▼ -0,049
Oceania	NZ	**.**	**0,045**	▲ 0,026	▲ 0,063	**.**	.
Oceania	AU	**.**	.	.	.	**.**	.
North America	CA	**0,069**	▼ -0,015	▲ 0,021	▲ 0,001	**.**	▼ -0,069
North America	US	**.**	.	.	.	**.**	.

Table 11.1.1: Road freight (Tonnes-km, per one thousand units of 2015 USD GDP) 2007-2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**51,2**	-5,60	-0,64	0,71	**48,3**	-2,87
Western Europe	BE	**98,3**	-23,19	2,92	-7,71	**.**	.
Western Europe	FR	**88,7**	-13,53	-13,49	2,51	**65,2**	-23,46
Western Europe	DE	**110,3**	-9,41	-7,15	-7,05	**86,4**	-23,88
Western Europe	IE	**83,3**	-36,78	-12,82	-0,33	**27,9**	-55,45
Western Europe	LU	**170,9**	-8,99	-43,81	-4,16	**.**	.
Western Europe	NL	**60,8**	-7,14	0,79	-1,54	**53,1**	-7,64
Western Europe	CH	**27,5**	-0,71	-2,08	-1,79	**.**	.
Western Europe	UK	**63,5**	-7,71	-4,10	-0,15	**.**	.
Northern Europe	DK	**40,1**	1,74	-1,08	-40,72	**.**	.
Northern Europe	FI	**122,0**	-9,66	-7,94	.	**.**	.
Northern Europe	IS	**49,4**	0,42	2,00	4,98	**.**	.
Northern Europe	NO	**45,3**	2,38	3,13	-0,80	**51,6**	6,26
Northern Europe	SE	**90,1**	-11,21	3,23	-4,68	**83,8**	-6,38
Southern Europe	CY	**.**	.	.	.	**.**	.
Southern Europe	EL	**65,3**	29,54	6,19	37,29	**104,6**	39,37
Southern Europe	IT	**90,1**	-15,42	-11,06	8,33	**77,6**	-12,45
Southern Europe	MT	**.**	.	.	.	**.**	.
Southern Europe	PT	**220,6**	-37,34	-20,16	-23,31	**149,1**	-71,49
Southern Europe	ES	**210,3**	-36,09	0,85	13,45	**218,1**	7,80
Central and Eastern Europe	BG	**320,3**	116,29	199,82	-277,95	**591,6**	271,23
Central and Eastern Europe	HR	**209,0**	-34,26	31,04	10,21	**227,0**	18,07
Central and Eastern Europe	CZ	**279,2**	32,40	0,60	-131,12	**302,1**	22,89
Central and Eastern Europe	EE	**274,5**	9,32	-10,42	-95,15	**181,3**	-93,26
Central and Eastern Europe	HU	**301,9**	-2,16	6,63	-55,68	**246,0**	-55,95
Central and Eastern Europe	LV	**453,0**	61,34	24,49	-52,23	**482,5**	29,54
Central and Eastern Europe	LT	**523,6**	66,09	49,47	462,87	**1130,9**	607,29
Central and Eastern Europe	PL	**430,0**	79,26	63,15	119,29	**685,6**	255,63
Central and Eastern Europe	RO	**381,0**	-218,40	56,78	60,65	**.**	.
Central and Eastern Europe	SK	**366,4**	-6,67	17,33	-36,48	**298,9**	-67,59
Central and Eastern Europe	SI	**59,1**	-7,98	-3,10	-2,23	**47,2**	-11,84
Oceania	NZ	**135,5**	1,64	-3,23	-0,05	**.**	.
Oceania	AU	**160,8**	-2,28	-8,69	-2,04	**151,0**	-9,83
North America	CA	**162,4**	-6,99	22,82	.	**.**	.
North America	US	**196,3**	-53,29	16,19	.	**.**	.

Source: OECD

Table 11.1.2: Road passengers (Passenger-km, per one thousand units of 2015 GDP) 2007-2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	.	.	.	.	.	.
Western Europe	BE	**305,6**	-15,95	-25,20	**-264,40**	.	.
Western Europe	FR	**330,3**	-7,53	26,17	-17,33	**298,4**	-31,94
Western Europe	DE	**304,5**	-1,46	-2,55	-27,57	.	.
Western Europe	IE	.	.	.	.	.	.
Western Europe	LU	.	.	.	.	.	.
Western Europe	NL	**225,3**	.	.	.	.	.
Western Europe	CH	**139,8**	4,41	-1,32	-1,55	.	.
Western Europe	UK	**262,0**	-3,06	-13,16	-3,15	.	.
Northern Europe	DK	**230,2**	1,32	-8,38	.	.	.
Northern Europe	FI	**291,8**	12,97	10,01	.	.	.
Northern Europe	IS	**342,8**	2,59	14,01	34,77	.	.
Northern Europe	NO	**170,0**	6,98	0,22	-2,25	**162,2**	-7,87
Northern Europe	SE	**267,3**	-12,45	-12,53	-48,63	**174,3**	-93,03
Southern Europe	CY	.	.	.	.	.	.
Southern Europe	EL	**160,1**	.	.	.	.	.
Southern Europe	IT	**391,5**	9,69	22,88	12,14	**320,5**	-71,04
Southern Europe	MT	.	.	**176,16**	.	.	.
Southern Europe	PT	**464,6**	.	.	.	.	.
Southern Europe	ES	**326,9**	1,32	-23,99	-20,82	.	.
Central and Eastern Europe	BG	.	.	.	.	.	.
Central and Eastern Europe	HR	.	**555,55**	31,14	-77,92	**425,3**	.
Central and Eastern Europe	CZ	**470,2**	-45,28	-1,05	1,50	**442,3**	-27,88
Central and Eastern Europe	EE	.	.	.	.	.	.
Central and Eastern Europe	HU	**594,1**	0,70	-17,80	4,89	**533,4**	-60,69
Central and Eastern Europe	LV	.	.	.	.	.	.
Central and Eastern Europe	LT	**1092,0**	-206,32	-226,28	**-659,39**	.	.
Central and Eastern Europe	PL	**566,0**	-32,63	-34,18	-29,35	**422,5**	-143,42
Central and Eastern Europe	RO	.	.	.	.	.	.
Central and Eastern Europe	SK	**457,0**	-57,78	-30,23	-19,12	.	.
Central and Eastern Europe	SI	**633,7**	.	.	.	.	.
Oceania	NZ	**314,7**	-10,94	.	251,89	.	.
Oceania	AU	**254,7**	-19,20	-12,30	-17,42	**185,3**	-69,40
North America	CA	**363,6**	.	.	.	.	.
North America	US	**357,4**	6,01	-12,29	.	.	.

Source: OECD

Table 11.2.1: Rail freight (Tonnes-kilometres per one thousand units 2015 USD GDP) 2007-2021

Region	Country	2007	2011		2015		2019		2021	Change	
Western Europe	AT	**58,6**	▼	-4,09	▼	-0,05	▼	-2,02	**53,8**	▼	-4,87
Western Europe	BE	**19,0**	▼	-3,84		.		.	**.**		.
Western Europe	FR	**18,3**	▼	-3,81	▲	0,45	▼	-1,94	**13,9**	▼	-4,38
Western Europe	DE	**36,8**	▼	-1,51	▼	-0,57	▲	1,17	**34,6**	▼	-2,20
Western Europe	IE	**0,6**	▼	-0,07	▼	-0,16	▼	-0,14	**0,2**	▼	-0,41
Western Europe	LU	**5,3**	▼	-0,37	▼	-1,50	▼	-0,56	**2,6**	▼	-2,77
Western Europe	NL	**9,8**	▼	-1,24	▲	0,03	▼	-0,12	**8,5**	▼	-1,27
Western Europe	CH	**19,5**	▼	-1,69	▲	0,12	▼	-2,29	**15,8**	▼	-3,66
Western Europe	UK	**7,8**	▼	-0,01	▼	-1,21	▼	-1,27	**.**		.
Northern Europe	DK	**6,0**	▲	3,06	▼	-0,49		.	**.**		.
Northern Europe	FI	**42,7**	▼	-3,48	▼	-3,11	▲	4,21	**41,9**	▼	-0,76
Northern Europe	IS	**.**		.		.		.	**.**		.
Northern Europe	NO	**9,8**	▲	0,16	▼	-0,58	▲	0,16	**10,2**	▲	0,46
Northern Europe	SE	**51,7**	▼	-2,87	▼	-7,86	▼	-0,56	**41,0**	▼	-10,71
Southern Europe	CY	**.**		.		.		.	**.**		.
Southern Europe	EL	**3,1**	▼	-1,51	▼	-0,13	▲	0,91	**2,9**	▼	-0,26
Southern Europe	IT	**11,7**	▼	-1,35	▲	0,98	▼	-0,21	**13,0**	▲	1,30
Southern Europe	MT	**.**		.		.		.	**.**		.
Southern Europe	PT	**12,3**	▼	-0,94	▲	1,99	▼	-2,21	**12,5**	▲	0,25
Southern Europe	ES	**9,1**	▼	-1,03	▲	0,96	▼	-1,14	**8,3**	▼	-0,79
Central and Eastern Europe	BG	**114,8**	▼	-47,06	▲	4,07	▼	-3,95	**78,4**	▼	-36,44
Central and Eastern Europe	HR	**65,3**	▼	-17,63	▼	-4,69	▲	7,36	**52,8**	▼	-12,51
Central and Eastern Europe	CZ	**94,6**	▼	-13,20	▼	-0,21	▼	-6,13	**77,4**	▼	-17,20
Central and Eastern Europe	EE	**360,1**	▼	-59,11	▼	-165,00	▼	-55,91	**73,7**	▼	-286,49
Central and Eastern Europe	HU	**85,5**	▼	-6,33	▲	0,81	▼	-7,88	**75,2**	▼	-10,26
Central and Eastern Europe	LV	**631,2**	▲	276,52	▼	-214,29	▼	-205,12	**235,4**	▼	-395,88
Central and Eastern Europe	LT	**371,1**	▲	42,47	▼	-74,87	▼	-3,02	**285,2**	▼	-85,92
Central and Eastern Europe	PL	**146,2**	▼	-21,20	▼	-18,99	▼	-10,55	**90,9**	▼	-55,34
Central and Eastern Europe	RO	**100,9**	▼	-10,03	▼	-13,97	▼	-15,80	**.**		.
Central and Eastern Europe	SK	**130,7**	▼	-32,09	▼	-3,67	▼	-9,69	**85,1**	▼	-45,61
Central and Eastern Europe	SI	**82,8**	▲	5,34	▲	8,76	▲	8,18	**94,6**	▲	11,89
Oceania	NZ	**28,2**	▼	-1,61	▼	-2,14	▼	-2,03	**.**		.
Oceania	AU	**181,7**	▲	34,52	▲	81,18	▼	-0,38	**297,2**	▲	115,58
North America	CA	**251,3**	▼	-10,33	▲	24,38	▼	-2,36	**254,3**	▲	2,98
North America	US	**162,4**	▼	-10,67	▼	-12,35	▼	-20,77	**.**		.

Table 11.2.2: Railway, passengers (Passenger-km, per one thousand units of 2015 GDP) 2007-2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**26,3**	2,87	2,81	0,27	**20,8**	-5,47
Western Europe	BE	**23,2**	1,76	-2,61	-0,44	**14,0**	-9,21
Western Europe	FR	**41,4**	3,16	-1,60	-0,04	**33,7**	-7,73
Western Europe	DE	**25,4**	1,20	0,67	1,08	**.**	.
Western Europe	IE	**8,7**	-1,06	-1,10	-0,11	**1,9**	-6,79
Western Europe	LU	**5,9**	0,54	0,56	0,04	**4,4**	-1,45
Western Europe	NL	**21,0**	1,01	-1,39	2,45	**12,9**	-8,15
Western Europe	CH	**28,4**	1,64	-0,68	-0,28	**18,8**	-9,59
Western Europe	UK	**21,1**	3,51	1,33	0,09	**.**	.
Northern Europe	DK	**21,6**	2,38	-1,46	.	**.**	.
Northern Europe	FI	**15,5**	0,74	1,33	1,79	**11,3**	-4,13
Northern Europe	IS	**.**	.	.	.	**.**	.
Northern Europe	NO	**8,3**	0,29	0,61	-0,10	**4,2**	-4,02
Northern Europe	SE	**22,8**	1,48	0,74	1,54	**14,1**	-8,70
Southern Europe	CY	**.**	.	.	.	**.**	.
Southern Europe	EL	**7,3**	-2,81	2,01	-0,31	**3,2**	-4,01
Southern Europe	IT	**25,0**	-0,52	3,95	1,07	**14,8**	-10,17
Southern Europe	MT	**.**	.	.	.	**.**	.
Southern Europe	PT	**19,0**	1,31	-0,42	2,48	**13,5**	-5,42
Southern Europe	ES	**17,8**	1,44	2,66	-0,07	**13,7**	-4,03
Central and Eastern Europe	BG	**53,1**	-10,53	-12,03	-4,03	**20,3**	-32,82
Central and Eastern Europe	HR	**29,5**	-0,37	-10,34	-6,04	**9,0**	-20,46
Central and Eastern Europe	CZ	**40,0**	-1,86	5,97	6,56	**32,3**	-7,70
Central and Eastern Europe	EE	**11,6**	-0,05	1,06	1,95	**10,0**	-1,58
Central and Eastern Europe	HU	**73,8**	-6,04	-6,98	-8,19	**36,0**	-37,77
Central and Eastern Europe	LV	**0,0**	0,00	0,00	0,00	**0,0**	0,00
Central and Eastern Europe	LT	**10,6**	0,10	-1,95	1,23	**6,4**	-4,12
Central and Eastern Europe	PL	**53,5**	-11,24	-5,89	2,19	**26,5**	-27,05
Central and Eastern Europe	RO	**47,9**	-16,55	-2,36	-1,85	**.**	.
Central and Eastern Europe	SK	**29,3**	0,78	8,26	2,77	**20,3**	-8,98
Central and Eastern Europe	SI	**18,6**	-0,50	-1,70	-2,59	**10,4**	-8,26
Oceania	NZ	**.**	.	.	**3,83**	**.**	.
Oceania	AU	**12,1**	0,57	-0,77	0,77	**6,1**	-5,94
North America	CA	**1,0**	-0,08	-0,11	0,15	**0,3**	-0,73
North America	US	**1,9**	0,10	0,02	-0,35	**.**	.

Table 11.3: Container port traffic (TEU per one thousand units of 2015 USD GDP) 2007-2021

Region	Country	2007	2011		2015		2019	2021	Change	
Western Europe	AT	**1,00**	▼	-0,24	▼	-0,02	.	.		.
Western Europe	BE	**23,96**	▼	-1,49	▼	-0,71	▲ 3,26	**26,25**	▲	2,29
Western Europe	FR	**2,14**	▼	-0,50	▲	0,20	▲ 0,08	**2,14**	▲	0,01
Western Europe	DE	**5,35**	▼	-0,61	▼	-0,26	▼ -0,30	**4,14**	▼	-1,21
Western Europe	IE	**5,11**	▼	-1,67	▼	-0,50	▼ -0,08	**2,55**	▼	-2,56
Western Europe	LU	**.**		.		.	.	**.**		.
Western Europe	NL	**15,27**	▲	0,79	▲	0,14	▲ 1,89	**18,64**	▲	3,37
Western Europe	CH	**0,17**	▼	-0,03		.	▲ 0,01	**.**		.
Western Europe	UK	**3,17**	▼	-0,14	▲	0,30	▼ -0,02	**3,23**	▲	0,06
Northern Europe	DK	**2,63**	▲	0,09	▼	-0,22	▲ 0,15	**3,09**	▲	0,46
Northern Europe	FI	**6,38**	▼	-0,55	▲	0,19	▲ 0,36	**5,50**	▼	-0,89
Northern Europe	IS	**17,45**	▼	-5,06	▲	1,23	▲ 2,31	**.**		.
Northern Europe	NO	**0,92**	▲	0,95	▲	0,03	▲ 0,15	**2,09**	▲	1,18
Northern Europe	SE	**2,87**	▲	0,31	▼	-0,31	▲ 0,09	**2,89**	▲	0,02
Southern Europe	CY	**1,35**	▼	-0,06	▼	-0,04	▲ 0,04	**1,07**	▼	-0,28
Southern Europe	EL	**6,84**	▲	2,50	▲	9,75	▲ 11,08	**30,17**	▲	23,32
Southern Europe	IT	**5,33**	▼	-0,35	▲	0,58	▲ 0,07	**6,05**	▲	0,72
Southern Europe	MT	**.**		.		.	.	**.**		.
Southern Europe	PT	**6,41**	▲	2,36	▲	4,96	▼ -0,68	**15,23**	▲	8,82
Southern Europe	ES	**10,84**	▲	0,87	▲	0,24	▲ 1,25	**14,30**	▲	3,46
Central and Eastern Europe	BG	**2,86**	▲	0,18	▲	0,92	▲ 0,60	**4,12**	▲	1,26
Central and Eastern Europe	HR	**2,65**	▲	0,81	▲	1,06	▲ 1,51	**6,12**	▲	3,47
Central and Eastern Europe	CZ	**.**		.		.	.	**.**		.
Central and Eastern Europe	EE	**7,73**	▲	1,76	▼	-0,35	▼ -0,16	**7,86**	▲	0,13
Central and Eastern Europe	HU	**.**		.		.	.	**.**		.
Central and Eastern Europe	LV	**8,15**	▲	4,79	▲	0,24	▲ 1,44	**13,88**	▲	5,73
Central and Eastern Europe	LT	**8,30**	▲	2,18	▼	-1,00	▲ 5,11	**13,06**	▲	4,76
Central and Eastern Europe	PL	**2,07**	▲	1,09	▲	0,74	▲ 1,43	**5,33**	▲	3,26
Central and Eastern Europe	RO	**9,03**	▼	-5,03	▼	-0,13	▼ -0,82	**.**		.
Central and Eastern Europe	SK	**.**		.		.	.	**.**		.
Central and Eastern Europe	SI	**7,02**	▲	6,82	▲	4,51	▲ 0,69	**19,11**	▲	12,09
Oceania	NZ	**15,04**	▲	0,64	▲	0,78	▲ 0,45	**15,30**	▲	0,26
Oceania	AU	**5,74**	▼	-0,08	▲	0,06	▲ 0,16	**5,35**	▼	-0,39
North America	CA	**3,19**	▲	0,09	▲	0,46	▲ 0,38	**4,24**	▲	1,05
North America	US	**2,74**	▼	-0,29	▲	0,10	.	**.**		.

Table 11.4.1: Air transport freight (Ton-km, per one thousand units of 2015 USD GDP) 2007-2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**1,2**	-0,22	-0,11	-0,15	**0,3**	-0,94
Western Europe	BE	**1,8**	1,05	0,38	-0,47	**3,7**	1,91
Western Europe	FR	**2,8**	-0,61	-0,46	0,05	**1,6**	-1,16
Western Europe	DE	**2,7**	-0,34	-0,32	0,08	**3,2**	0,50
Western Europe	IE	**0,5**	0,03	-0,10	.	**0,2**	-0,35
Western Europe	LU	**102,2**	-16,88	19,76	3,59	**124,5**	22,33
Western Europe	NL	**6,8**	1,70	-1,56	-0,18	**5,1**	-1,64
Western Europe	CH	**1,8**	0,29	-0,06	0,17	**1,6**	-0,18
Western Europe	UK	**2,3**	0,08	-0,49	.	**1,3**	-0,92
Northern Europe	DK	**.**	.	.	.	**.**	.
Northern Europe	FI	**2,0**	1,09	-0,05	1,15	**2,9**	0,91
Northern Europe	IS	**8,5**	-3,20	0,89	0,50	**7,4**	-1,04
Northern Europe	NO	**.**	.	.	.	**.**	.
Northern Europe	SE	**.**	1,06	0,12	0,62	**0,6**	.
Southern Europe	CY	**.**	.	.	.	**.**	.
Southern Europe	EL	**0,3**	-0,25	0,11	-0,02	**0,1**	-0,21
Southern Europe	IT	**0,8**	-0,38	0,12	0,19	**0,6**	-0,16
Southern Europe	MT	**1,5**	-0,76	-0,44	0,17	**0,2**	-1,31
Southern Europe	PT	**1,5**	0,20	-0,02	0,69	**2,3**	0,79
Southern Europe	ES	**1,0**	0,13	-0,24	0,03	**0,7**	-0,29
Central and Eastern Europe	BG	**0,1**	-0,02	-0,02	-0,01	**.**	-0,06
Central and Eastern Europe	HR	**.**	-0,01	-0,02	-0,01	**.**	-0,04
Central and Eastern Europe	CZ	**0,2**	-0,09	0,05	-0,04	**.**	-0,19
Central and Eastern Europe	EE	**.**	0,19	-0,20	.	**.**	.
Central and Eastern Europe	HU	**0,2**	-0,18	.	.	**.**	.
Central and Eastern Europe	LV	**0,5**	-0,26	-0,14	0,08	**0,1**	-0,41
Central and Eastern Europe	LT	**.**	0,03	-0,05	.	**.**	.
Central and Eastern Europe	PL	**0,2**	-0,13	0,15	0,32	**0,4**	0,14
Central and Eastern Europe	RO	**.**	.	-0,01	-0,01	**.**	-0,03
Central and Eastern Europe	SK	**0,7**	.	.	.	**.**	.
Central and Eastern Europe	SI	**0,1**	-0,05	-0,02	-0,01	**.**	.
Oceania	NZ	**5,6**	0,03	0,81	-0,55	**1,5**	-4,12
Oceania	AU	**2,0**	0,24	-0,69	-0,23	**0,8**	-1,20
North America	CA	**1,0**	0,34	-0,04	0,50	**1,9**	0,90
North America	US	**2,5**	-0,10	-0,30	0,05	**2,2**	-0,24

Source: OECD

Table 11.4.2: Air transport (Passengers per one thousand units of 2015 USD GDP) 2007-2021

Region	Country	2007	2011		2015		2019		2021		Change	
Western Europe	AT	**0,025**	▲	0,013	▲	0,001	▲	0,074	**0,047**	▲	0,022	
Western Europe	BE	**0,010**	▲	0,010	▲	0,005	▲	0,004	**0,011**	▲	0,001	
Western Europe	FR	**0,026**	▲	0,001	▲	0,000	▲	0,001	**0,012**	▼	-0,014	
Western Europe	DE	**0,034**	▼	-0,001	▲	0,002	▼	-0,004	**0,009**	▼	-0,025	
Western Europe	IE	**0,262**	▲	0,160	▼	-0,024	▲	0,061	**0,165**	▼	-0,096	
Western Europe	LU	**0,019**	▼	-0,005	▲	0,016	▲	0,001	**0,016**	▼	-0,004	
Western Europe	NL	**0,039**	▲	0,001	▲	0,007	▲	0,009	**0,023**	▼	-0,016	
Western Europe	CH	**0,020**	▲	0,018	▲	0,001	▲	0,002	**0,014**	▼	-0,006	
Western Europe	UK	**0,037**	▲	0,004	▲	0,003	▲	0,000	**0,009**	▼	-0,029	
Northern Europe	DK	**.**		.		.		.	**.**		.	
Northern Europe	FI	**0,034**	▲	0,006	▲	0,016	▲	0,002	**0,011**	▼	-0,023	
Northern Europe	IS	**0,103**	▲	0,035	▲	0,098	▼	-0,013	**0,075**	▼	-0,028	
Northern Europe	NO	**.**		.		.		.	**.**		.	
Northern Europe	SE	**.**		**0,099**	▲	0,017	▼	-0,023	**0,035**		.	
Southern Europe	CY	**.**		.		.		.	**.**		.	
Southern Europe	EL	**0,038**	▲	0,006	▲	0,013	▲	0,022	**0,043**	▲	0,005	
Southern Europe	IT	**0,019**	▼	-0,001	▼	-0,002	▼	-0,001	**0,001**	▼	-0,018	
Southern Europe	MT	**0,212**	▼	-0,016	▼	-0,053	▲	0,024	**0,041**	▼	-0,170	
Southern Europe	PT	**0,049**	▲	0,005	▲	0,010	▲	0,035	**0,037**	▼	-0,012	
Southern Europe	ES	**0,049**	▼	-0,005	▲	0,006	▲	0,016	**0,035**	▼	-0,014	
Central and Eastern Europe	BG	**0,019**	▲	0,000	▲	0,002	▼	-0,006	**0,001**	▼	-0,018	
Central and Eastern Europe	HR	**0,028**	▲	0,007	▲	0,000	▲	0,000	**0,013**	▼	-0,015	
Central and Eastern Europe	CZ	**0,028**	▲	0,000	▼	-0,010	▲	0,007	**0,007**	▼	-0,022	
Central and Eastern Europe	EE	**0,028**	▲	0,002	▼	-0,007		.	**.**		.	
Central and Eastern Europe	HU	**0,026**	▲	0,093		.		.	**.**		.	
Central and Eastern Europe	LV	**0,046**	▲	0,092	▼	-0,046	▲	0,069	**0,051**	▲	0,005	
Central and Eastern Europe	LT	**0,011**	▼	-0,009	▲	0,031		.	**.**		.	
Central and Eastern Europe	PL	**0,012**	▼	-0,001	▼	-0,001	▲	0,009	**0,006**	▼	-0,005	
Central and Eastern Europe	RO	**0,019**	▲	0,003	▼	-0,002	▲	0,005	**0,012**	▼	-0,007	
Central and Eastern Europe	SK	**0,041**		.		.		.	**.**		.	
Central and Eastern Europe	SI	**0,022**	▲	0,001	▲	0,001	▼	-0,007	**.**		.	
Oceania	NZ	**0,082**	▲	0,006	▼	-0,007	▲	0,007	**0,042**	▼	-0,040	
Oceania	AU	**0,042**	▲	0,008	▲	0,007	▼	-0,004	**0,016**	▼	-0,026	
North America	CA	**0,038**	▲	0,008	▲	0,006	▲	0,004	**0,015**	▼	-0,023	
North America	US	**0,046**	▼	-0,002	▲	0,000	▲	0,003	**0,032**	▼	-0,013	

Source: OECD

Table 11.4.3: Air transport (Passengers-km, per one thousand units of 2015 USD GDP) 2008-2021

Region	Country	2008	2011	2015	2019	2021	Change
Western Europe	AT	**46,6**	4,8	11,2	14,8	**30,2**	-16,4
Western Europe	BE	**26,4**	1,0	5,7	4,4	**11,3**	-15,0
Western Europe	FR	**59,3**	0,9	7,4	10,2	**29,1**	-30,2
Western Europe	DE	**28,9**	1,2	3,8	4,9	**12,7**	-16,1
Western Europe	IE	**37,2**	-2,2	-4,9	-1,5	**6,6**	-30,6
Western Europe	LU	**12,8**	0,8	2,5	1,2	**5,3**	-7,4
Western Europe	NL	**15,9**	0,8	3,4	2,3	**6,9**	-9,0
Western Europe	CH	**17,8**	0,3	2,1	3,2	**8,4**	-9,5
Western Europe	UK	.	.	.	.	.	.
Northern Europe	DK	**27,8**	2,4	2,2	1,8	**9,1**	-18,8
Northern Europe	FI	**21,6**	1,0	2,6	3,8	**5,4**	-16,2
Northern Europe	IS	**94,5**	16,6	17,9	22,5	**42,8**	-51,7
Northern Europe	NO	**23,2**	2,5	2,9	1,4	**12,0**	-11,3
Northern Europe	SE	**39,1**	0,8	3,6	2,5	**12,4**	-26,7
Southern Europe	CY	**55,4**	3,9	43,1	21,9	**42,0**	-13,4
Southern Europe	EL	**85,6**	16,4	37,3	40,8	**84,1**	-1,5
Southern Europe	IT	**27,1**	3,3	4,6	8,7	**18,8**	-8,3
Southern Europe	MT	**23,0**	1,7	-1,8	3,5	**8,9**	-14,1
Southern Europe	PT	**55,5**	7,0	15,1	13,4	**36,9**	-18,7
Southern Europe	ES	**62,7**	6,3	4,3	15,2	**39,2**	-23,5
Central and Eastern Europe	BG	**215,2**	49,3	100,6	49,8	**189,7**	-25,5
Central and Eastern Europe	HR	**196,1**	37,3	57,9	66,6	**153,6**	-42,4
Central and Eastern Europe	CZ	**63,6**	6,7	10,1	16,3	**33,8**	-29,7
Central and Eastern Europe	EE	**114,0**	23,2	7,0	11,1	**25,2**	-88,8
Central and Eastern Europe	HU	**91,2**	18,7	23,0	23,5	**65,6**	-25,6
Central and Eastern Europe	LV	**90,8**	39,1	-1,0	22,8	**27,4**	-63,4
Central and Eastern Europe	LT	**63,0**	18,3	3,1	14,4	**20,1**	-42,9
Central and Eastern Europe	PL	**55,6**	2,3	5,4	9,1	**20,3**	-35,2
Central and Eastern Europe	RO	**89,3**	24,6	20,8	17,6	**68,4**	-20,9
Central and Eastern Europe	SK	**52,7**	5,1	5,4	22,6	**30,9**	-21,9
Central and Eastern Europe	SI	**72,3**	9,9	20,1	18,4	**51,3**	-21,0
Oceania	NZ	.	.	.	.	.	.
Oceania	AU	.	.	.	.	.	.
North America	CA	.	.	.	.	.	.
North America	US	.	.	.	.	.	.

Source: Eurostat

Table 12.1: Logistic performance index: Quality of trade and transport-related infrastructure (1=low to 5=high) 2008-2021

Region	Country	2007	2012		2016		2018		2022	Change
Western Europe	AT	**4,1**	▼	-0,01	▲	0,03	▲	0,10	**3,9**	▼ -0,16
Western Europe	BE	**4,0**	▲	0,12	▼	-0,07	▼	-0,07	**4,1**	▲ 0,10
Western Europe	FR	**3,8**	▲	0,14	▲	0,05	▼	-0,01	**3,8**	▼ -0,02
Western Europe	DE	**4,2**	▲	0,07	▲	0,18	▼	-0,07	**4,3**	▲ 0,11
Western Europe	IE	**3,7**	▼	-0,37	▲	0,42	▼	-0,48	**3,5**	▼ -0,22
Western Europe	LU	**3,9**	▼	-0,07	▲	0,45	▼	-0,61	**3,6**	▼ -0,26
Western Europe	NL	**4,3**	▼	-0,14	▲	0,14	▼	-0,08	**4,2**	▼ -0,09
Western Europe	CH	**4,1**	▼	-0,15	▲	0,21	▼	-0,17	**4,4**	▲ 0,27
Western Europe	UK	**4,1**	▼	-0,10	▲	0,26	▼	-0,18	**3,7**	▼ -0,35
Northern Europe	DK	**3,8**	▲	0,25	▼	-0,32	▲	0,21	**4,1**	▲ 0,28
Northern Europe	FI	**3,8**	▲	0,31	▼	-0,11	▼	-0,01	**4,2**	▲ 0,39
Northern Europe	IS	**3,3**	▲	0,06	▼	-0,37	▲	0,17	**3,6**	▲ 3,60
Northern Europe	NO	**3,8**	▲	0,04	▲	0,09	▼	-0,26	**3,9**	▲ 0,08
Northern Europe	SE	**4,1**	▲	0,02	▲	0,14	▼	-0,03	**4,2**	▲ 0,09
Southern Europe	CY	**2,9**	▲	0,26	▼	-0,17	▼	-0,11	**2,8**	▼ -0,11
Southern Europe	EL	**3,1**	▼	-0,17	▲	0,44	▼	-0,15	**3,7**	▲ 0,65
Southern Europe	IT	**3,5**	▲	0,22	▲	0,05	▲	0,06	**3,8**	▲ 0,28
Southern Europe	MT	**2,9**		**3,1**	▼	-0,16	▼	-0,04	**3,7**	▲ 3,70
Southern Europe	PT	**3,2**	▲	0,26	▼	-0,33	▲	0,16	**3,6**	▲ 0,44
Southern Europe	ES	**3,5**	▲	0,23	▼	-0,02	▲	0,12	**3,8**	▲ 0,29
Central and Eastern Europe	BG	**2,5**	▲	0,73	▼	-0,85	▲	0,41	**3,1**	▲ 0,63
Central and Eastern Europe	HR	**2,5**	▲	0,85	▼	-0,36	▲	0,02	**3,0**	▲ 0,50
Central and Eastern Europe	CZ	**3,0**	▼	-0,04	▲	0,40	▲	0,10	**3,0**	▲ 0,00
Central and Eastern Europe	EE	**2,9**	▼	-0,12	▲	0,39	▼	-0,08	**3,5**	▲ 0,59
Central and Eastern Europe	HU	**3,1**	▲	0,02	▲	0,34	▼	-0,21	**3,1**	▼ -0,02
Central and Eastern Europe	LV	**2,6**	▼	-0,04	▲	0,72	▼	-0,26	**3,3**	▲ 0,74
Central and Eastern Europe	LT	**2,3**	▲	0,28	▲	0,99	▼	-0,84	**3,5**	▲ 1,20
Central and Eastern Europe	PL	**2,7**	▲	0,41	▲	0,07	▲	0,04	**3,5**	▲ 0,81
Central and Eastern Europe	RO	**2,7**	▼	-0,22	▲	0,37	▲	0,03	**2,9**	▲ 0,17
Central and Eastern Europe	SK	**2,7**	▲	0,31	▲	0,25	▼	-0,24	**3,3**	▲ 0,62
Central and Eastern Europe	SI	**3,2**	▲	0,02	▼	-0,05	▲	0,07	**3,6**	▲ 0,38
Oceania	NZ	**3,6**	▼	-0,19	▲	0,13	▲	0,44	**3,8**	▲ 0,19
Oceania	AU	**3,7**	▲	0,18	▼	-0,01	▲	0,15	**4,1**	▲ 0,45
North America	CA	**4,0**	▲	0,04	▲	0,15	▼	-0,39	**4,3**	▲ 0,35
North America	US	**4,1**	▲	0,07	▲	0,01	▼	-0,10	**3,9**	▼ -0,17

Source: World Bank

Table 13.1: Investment in Information and communication technology, (% of GDP), 2007 – 2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**2,74**	▲ 0,37	▲ 0,13	▲ 0,54	.	.
Western Europe	BE	**2,52**	▲ 0,24	▼ -0,04	▲ 0,20	**2,83**	▲ 0,31
Western Europe	FR	**2,81**	▲ 0,06	▲ 0,35	▲ 0,67	**4,29**	▲ 1,47
Western Europe	DE	**1,65**	▼ -0,16	▼ -0,06	▲ 0,05	**1,49**	▼ -0,16
Western Europe	IE	**1,15**	▲ 0,65	▼ -0,12	▼ -0,36	.	.
Western Europe	LU	**1,43**	▼ -0,21	▼ -0,08	▲ 0,15	.	.
Western Europe	NL	**3,37**	▼ -0,14	▲ 1,21	▼ -0,82	**3,78**	▲ 0,41
Western Europe	CH	**4,48**	▼ -0,19	▲ 0,36	▼ -0,26	**5,18**	▲ 0,69
Western Europe	UK	**2,37**	▲ 0,02	▲ 0,07	▲ 0,07	.	.
Northern Europe	DK	**2,71**	▲ 0,05	▼ -0,02	▲ 0,39	.	.
Northern Europe	FI	**1,96**	▼ -0,11	▲ 0,12	▲ 0,10	**1,98**	▲ 0,02
Northern Europe	IS	**1,79**	▲ 0,34	▼ -0,70	▲ 0,17	**1,92**	▲ 0,13
Northern Europe	NO	**1,61**	▼ -0,05	▲ 0,05	▲ 0,87	.	.
Northern Europe	SE	**4,95**	▼ -0,46	▲ 0,12	▲ 0,04	.	.
Southern Europe	CY	.	.	.	.	.	.
Southern Europe	EL	**1,68**	▼ -0,20	▲ 0,08	▼ -1,56	.	.
Southern Europe	IT	**2,00**	▼ -0,13	▲ 0,35	▲ 0,03	**2,34**	▲ 0,34
Southern Europe	MT	.	.	.	.	.	.
Southern Europe	PT	**2,20**	▼ -0,24	▲ 0,03	▲ 0,19	.	.
Southern Europe	ES	**1,91**	▲ 0,12	▲ 0,37	▼ -0,02	.	.
Central and Eastern Europe	BG	.	.	.	.	.	.
Central and Eastern Europe	HR	.	.	.	.	.	.
Central and Eastern Europe	CZ	**3,57**	▲ 0,07	▲ 0,52	▲ 0,49	**4,89**	▲ 1,33
Central and Eastern Europe	EE	**2,24**	▲ 0,42	▲ 0,30	▲ 0,84	.	.
Central and Eastern Europe	HU	**1,53**	▼ -0,19	▲ 0,11	▲ 0,40	**1,78**	▲ 0,26
Central and Eastern Europe	LV	**1,72**	▼ -0,25	▲ 0,44	▼ -0,38	.	.
Central and Eastern Europe	LT	**2,73**	▼ -0,14	▼ -0,22	▲ 0,74	.	.
Central and Eastern Europe	PL	**1,27**	▼ -0,31	▲ 0,02	▼ -0,21	.	.
Central and Eastern Europe	RO	.	.	.	.	.	.
Central and Eastern Europe	SK	**2,86**	▼ -1,18	▲ 0,15	▼ -0,33	**1,38**	▼ -1,48
Central and Eastern Europe	SI	**2,50**	▼ -0,55	▲ 0,06	▲ 0,13	**2,23**	▼ -0,27
Oceania	NZ	**3,47**	▲ 0,14	▲ 0,36	.	.	.
Oceania	AU	**2,75**	▼ -0,65	▼ -0,13	▼ -0,08	**1,79**	▼ -0,96
North America	CA	**2,67**	▼ -0,40	▼ -0,02	▲ 0,41	**2,47**	▼ -0,20
North America	US	**3,14**	▲ 0,06	▲ 0,00	▲ 0,28	**3,71**	▲ 0,57

Source: OECD

Table 13.2: Investment in Intellectual property products (% of GDP), 2007 – 2021

Region	Country	2007	2011	2015	2019	2021	Change
Western Europe	AT	**3,69**	0,66	0,48	0,78	**5,74**	2,06
Western Europe	BE	**3,13**	0,81	0,81	0,00	**5,01**	1,89
Western Europe	FR	**4,50**	0,34	0,31	0,58	**6,18**	1,68
Western Europe	DE	**3,07**	0,30	0,18	0,41	**3,82**	0,74
Western Europe	IE	**3,63**	1,07	7,99	27,15	**11,83**	8,20
Western Europe	LU	**1,07**	0,29	-0,03	0,08	**1,57**	0,49
Western Europe	NL	**5,46**	-1,30	3,39	-2,91	**4,84**	-0,61
Western Europe	CH	**7,33**	0,03	1,06	0,58	**10,13**	2,80
Western Europe	UK	**3,34**	0,43	-0,03	0,17	**4,06**	0,72
Northern Europe	DK	**3,83**	1,03	0,12	0,58	**5,50**	1,67
Northern Europe	FI	**4,89**	0,12	-0,76	0,09	**4,43**	-0,45
Northern Europe	IS	**2,31**	0,37	-0,60	0,17	**3,10**	0,78
Northern Europe	NO	**2,77**	0,58	0,25	0,65	**4,01**	1,24
Northern Europe	SE	**6,37**	0,12	0,07	-0,31	**7,33**	0,95
Southern Europe	CY	**0,80**	.	.	.	**.**	.
Southern Europe	EL	**1,87**	-0,35	0,30	0,42	**2,48**	0,60
Southern Europe	IT	**2,51**	0,05	0,41	0,13	**3,12**	0,62
Southern Europe	MT	**2,00**	0,60	0,30	1,80	**4,90**	2,90
Southern Europe	PT	**2,18**	0,52	-0,17	0,34	**3,49**	1,31
Southern Europe	ES	**2,39**	0,55	0,38	-0,04	**3,52**	1,12
Central and Eastern Europe	BG	**1,40**	-0,10	0,20	0,90	**1,90**	0,50
Central and Eastern Europe	HR	**1,70**	-0,50	0,40	0,10	**1,90**	0,20
Central and Eastern Europe	CZ	**3,11**	0,11	0,60	1,42	**5,22**	2,12
Central and Eastern Europe	EE	**1,59**	0,74	0,36	0,43	**7,30**	5,71
Central and Eastern Europe	HU	**2,49**	-0,02	0,66	-0,25	**2,84**	0,35
Central and Eastern Europe	LV	**1,29**	0,20	0,10	0,25	**2,22**	0,93
Central and Eastern Europe	LT	**1,51**	0,22	0,05	0,80	**2,65**	1,13
Central and Eastern Europe	PL	**1,38**	-0,19	0,21	0,10	**1,45**	0,07
Central and Eastern Europe	RO	**2,30**	-0,40	-0,10	0,40	**1,70**	-0,60
Central and Eastern Europe	SK	**2,33**	-0,56	0,42	-0,05	**1,93**	-0,39
Central and Eastern Europe	SI	**2,65**	0,39	-0,16	0,31	**3,27**	0,62
Oceania	NZ	**2,80**	0,25	0,18	0,21	**3,63**	0,83
Oceania	AU	**3,08**	-0,03	-0,42	-0,10	**2,39**	-0,68
North America	CA	**3,22**	-0,13	-0,26	0,22	**2,99**	-0,23
North America	US	**4,92**	0,27	0,05	0,66	**6,43**	1,51

Source: OECD

Table 14.1: Index to assess the level of ICT infrastructure for using, adopting and adapting frontier technologies. (min. 0 - max. 1)

Region	Country	2008	2011	2015	2019	2021	Change
Western Europe	AT	**0,763**	0,014	-0,072	0,122	**0,800**	0,037
Western Europe	BE	**0,640**	0,022	0,213	0,028	**0,900**	0,260
Western Europe	FR	**0,566**	0,201	0,000	0,076	**0,800**	0,234
Western Europe	DE	**0,816**	0,057	-0,089	0,054	**0,800**	-0,016
Western Europe	IE	**0,609**	0,138	0,170	-0,084	**0,800**	0,191
Western Europe	LU	**0,814**	-0,015	-0,027	0,204	**0,900**	0,086
Western Europe	NL	**0,939**	-0,082	-0,004	0,094	**0,900**	-0,039
Western Europe	CH	**0,729**	-0,052	0,015	0,232	**0,800**	0,071
Western Europe	UK	**1,000**	-0,082	-0,100	0,064	**0,800**	-0,200
Northern Europe	DK	**0,900**	0,035	-0,058	0,118	**0,800**	-0,100
Northern Europe	FI	**0,752**	0,092	-0,064	0,097	**0,800**	0,048
Northern Europe	IS	**0,809**	0,106	-0,093	0,079	**1,000**	0,191
Northern Europe	NO	**0,829**	-0,127	0,050	0,207	**0,900**	0,071
Northern Europe	SE	**0,799**	0,087	0,114	0,000	**0,900**	0,101
Southern Europe	CY	**0,296**	0,089	0,157	0,176	**0,700**	0,404
Southern Europe	EL	**0,482**	0,002	0,055	0,147	**0,700**	0,218
Southern Europe	IT	**0,802**	-0,161	-0,059	0,096	**0,700**	-0,102
Southern Europe	MT	**0,629**	0,006	0,128	0,019	**0,900**	0,271
Southern Europe	PT	**0,719**	-0,027	-0,044	0,123	**0,800**	0,081
Southern Europe	ES	**0,583**	-0,069	-0,039	0,411	**0,900**	0,317
Central and Eastern Europe	BG	**0,613**	0,085	-0,051	0,030	**0,700**	0,087
Central and Eastern Europe	HR	**0,512**	0,082	-0,020	0,125	**0,700**	0,188
Central and Eastern Europe	CZ	**0,883**	-0,289	-0,044	0,251	**0,700**	-0,183
Central and Eastern Europe	EE	**0,659**	0,066	-0,004	0,168	**0,900**	0,241
Central and Eastern Europe	HU	**0,667**	-0,155	-0,010	0,323	**0,900**	0,233
Central and Eastern Europe	LV	**0,705**	-0,100	0,031	0,214	**0,800**	0,095
Central and Eastern Europe	LT	**0,546**	-0,044	0,366	-0,038	**0,800**	0,254
Central and Eastern Europe	PL	**0,449**	-0,088	0,274	0,156	**0,800**	0,351
Central and Eastern Europe	RO	**0,538**	0,238	-0,003	-0,063	**0,800**	0,262
Central and Eastern Europe	SK	**0,723**	-0,099	-0,055	0,277	**0,800**	0,077
Central and Eastern Europe	SI	**0,604**	-0,082	-0,041	0,343	**0,800**	0,196
Oceania	NZ	**0,898**	0,020	-0,104	0,096	**0,900**	0,002
Oceania	AU	**0,470**	0,264	-0,015	0,079	**0,800**	0,330
North America	CA	**0,607**	0,066	0,114	0,107	**0,900**	0,293
North America	US	**0,651**	-0,120	0,005	0,354	**0,900**	0,249

Source: UNCTAD calculations, based on data retrieved from ITU, M-Lab, UNDP, ILO, Scopus, Patseer, World Bank and https://unctadstat.unctad.org/datacentre/dataviewer/US.FTRI.

Table 14.2: Index to assess the level of R&D capacity for using, adopting and adapting frontier technologies. (min. 0 - max. 1)

Region	Country	2008	2011		2015		2019		2021	Change	
Western Europe	AT	**0,564**	▲	0,041	▼	-0,040	▲	0,013	**0,600**	▲	0,036
Western Europe	BE	**0,596**	▼	-0,003	▼	-0,005	▼	-0,012	**0,600**	▲	0,004
Western Europe	FR	**0,795**	▲	0,003	▼	-0,024	▼	-0,046	**0,700**	▼	-0,095
Western Europe	DE	**0,825**	▲	0,022	▼	-0,031	▼	-0,025	**0,800**	▼	-0,025
Western Europe	IE	**0,460**	▲	0,001	▲	0,044	▲	0,092	**0,600**	▲	0,140
Western Europe	LU	**0,298**	▲	0,025	▲	0,071	▲	0,076	**0,400**	▲	0,102
Western Europe	NL	**0,658**	▲	0,008	▼	-0,007	▼	-0,004	**0,600**	▼	-0,058
Western Europe	CH	**0,684**	▲	0,017	▼	-0,018	▼	-0,021	**0,700**	▲	0,016
Western Europe	UK	**0,759**	▼	-0,003	▼	-0,005	▲	0,000	**0,900**	▲	0,141
Northern Europe	DK	**0,529**	▲	0,037	▼	-0,004	▼	-0,004	**0,600**	▲	0,071
Northern Europe	FI	**0,515**	▲	0,008	▲	0,025	▲	0,049	**0,600**	▲	0,085
Northern Europe	IS	**0,279**	▼	-0,066	▲	0,022	▲	0,029	**0,300**	▲	0,021
Northern Europe	NO	**0,482**	▼	-0,006	▲	0,003	▲	0,038	**0,500**	▲	0,018
Northern Europe	SE	**0,628**	▼	-0,021	▲	0,029	▲	0,009	**0,600**	▼	-0,028
Southern Europe	CY	**0,229**	▼	-0,042	▲	0,099	▲	0,129	**0,400**	▲	0,171
Southern Europe	EL	**0,373**	▲	0,069	▲	0,038	▲	0,004	**0,300**	▼	-0,073
Southern Europe	IT	**0,689**	▲	0,006	▼	-0,012	▼	-0,002	**0,700**	▲	0,011
Southern Europe	MT	**0,143**	▼	-0,027	▲	0,128	▲	0,004	**0,300**	▲	0,157
Southern Europe	PT	**0,463**	▲	0,080	▼	-0,022	▼	-0,021	**0,500**	▲	0,037
Southern Europe	ES	**0,651**	▲	0,043	▼	-0,024	▼	-0,014	**0,600**	▼	-0,051
Central and Eastern Europe	BG	**0,329**	▼	-0,003	▲	0,028	▼	-0,062	**0,400**	▲	0,071
Central and Eastern Europe	HR	**0,321**	▼	-0,074	▲	0,035	▼	-0,042	**0,400**	▲	0,079
Central and Eastern Europe	CZ	**0,445**	▲	0,031	▲	0,044	▼	-0,022	**0,500**	▲	0,055
Central and Eastern Europe	EE	**0,252**	▼	-0,067	▲	0,123	▲	0,018	**0,300**	▲	0,048
Central and Eastern Europe	HU	**0,376**	▲	0,095	▼	-0,068	▼	-0,006	**0,400**	▲	0,024
Central and Eastern Europe	LV	**0,257**	▲	0,126	▼	-0,058	▼	-0,079	**0,300**	▲	0,043
Central and Eastern Europe	LT	**0,215**	▲	0,108	▼	-0,030	▲	0,061	**0,400**	▲	0,185
Central and Eastern Europe	PL	**0,428**	▲	0,061	▲	0,037	▼	-0,025	**0,500**	▲	0,072
Central and Eastern Europe	RO	**0,431**	▲	0,026	▲	0,064	▼	-0,036	**0,500**	▲	0,069
Central and Eastern Europe	SK	**0,256**	▲	0,110	▲	0,021	▲	0,026	**0,400**	▲	0,144
Central and Eastern Europe	SI	**0,354**	▲	0,023	▲	0,000	▼	-0,061	**0,400**	▲	0,046
Oceania	NZ	**0,460**	▼	-0,004	▼	-0,015	▼	-0,007	**0,400**	▼	-0,060
Oceania	AU	**0,649**	▲	0,010	▲	0,007	▲	0,004	**0,700**	▲	0,051
North America	CA	**0,713**	▼	-0,004	▼	-0,010	▼	-0,002	**0,700**	▼	-0,013
North America	US	**1,000**	▲	0,000	▼	-0,024	▼	-0,040	**0,700**	▼	-0,300

Source: UNCTAD calculations, based on data from ITU, M-Lab, UNDP, ILO, Scopus, Patseer, World Bank and https://unctadstat.unctad.org/datacentre/dataviewer/US.FTRI.

Table 14.3: Index to assess the level of relevant Skills for using, adopting and adapting frontier technologies. (min. 0 - max. 1)

Region	Country	2008	2011	2015	2019	2021	Change
Western Europe	AT	**0,777**	-0,043	0,009	-0,068	**0,700**	-0,077
Western Europe	BE	**1,000**	-0,051	0,018	-0,085	**0,900**	-0,100
Western Europe	FR	**0,876**	-0,055	-0,024	-0,077	**0,700**	-0,176
Western Europe	DE	**0,881**	-0,044	-0,018	-0,079	**0,800**	-0,081
Western Europe	IE	**0,868**	0,011	0,007	-0,050	**0,800**	-0,068
Western Europe	LU	**0,797**	0,031	0,034	-0,128	**0,800**	0,003
Western Europe	NL	**0,916**	-0,041	0,030	-0,101	**0,900**	-0,016
Western Europe	CH	**0,880**	-0,062	0,022	-0,066	**0,800**	-0,080
Western Europe	UK	**0,914**	-0,070	0,055	-0,112	**0,800**	-0,114
Northern Europe	DK	**0,888**	-0,029	0,085	-0,098	**0,900**	0,012
Northern Europe	FI	**0,911**	-0,061	0,023	-0,086	**0,900**	-0,011
Northern Europe	IS	**0,974**	-0,022	0,037	-0,106	**0,900**	-0,074
Northern Europe	NO	**0,953**	-0,049	0,028	-0,087	**0,900**	-0,053
Northern Europe	SE	**0,890**	-0,059	0,026	-0,029	**0,900**	0,010
Southern Europe	CY	**0,678**	-0,008	-0,052	-0,052	**0,600**	-0,078
Southern Europe	EL	**0,745**	-0,032	-0,016	-0,064	**0,700**	-0,045
Southern Europe	IT	**0,798**	-0,053	-0,022	-0,083	**0,700**	-0,098
Southern Europe	MT	**0,752**	-0,048	0,003	-0,031	**0,700**	-0,052
Southern Europe	PT	**0,699**	-0,015	0,050	-0,095	**0,700**	0,001
Southern Europe	ES	**0,740**	-0,008	0,028	-0,075	**0,700**	-0,040
Central and Eastern Europe	BG	**0,625**	-0,017	0,014	-0,087	**0,600**	-0,025
Central and Eastern Europe	HR	**0,651**	-0,035	0,052	-0,081	**0,600**	-0,051
Central and Eastern Europe	CZ	**0,762**	-0,027	0,021	-0,076	**0,700**	-0,062
Central and Eastern Europe	EE	**0,834**	-0,024	-0,016	-0,083	**0,700**	-0,134
Central and Eastern Europe	HU	**0,754**	-0,054	-0,012	-0,115	**0,600**	-0,154
Central and Eastern Europe	LV	**0,792**	-0,028	-0,033	-0,060	**0,700**	-0,092
Central and Eastern Europe	LT	**0,861**	-0,011	-0,063	-0,108	**0,700**	-0,161
Central and Eastern Europe	PL	**0,728**	-0,038	0,045	-0,066	**0,700**	-0,028
Central and Eastern Europe	RO	**0,580**	0,019	-0,093	-0,055	**0,500**	-0,080
Central and Eastern Europe	SK	**0,701**	-0,018	-0,062	-0,073	**0,600**	-0,101
Central and Eastern Europe	SI	**0,857**	-0,016	0,004	-0,103	**0,800**	-0,057
Oceania	NZ	**0,989**	0,011	-0,076	-0,098	**0,900**	-0,089
Oceania	AU	**0,990**	-0,024	0,034	0,000	**1,000**	0,010
North America	CA	**0,849**	-0,044	-0,028	-0,068	**0,700**	-0,149
North America	US	**0,885**	-0,041	-0,023	-0,085	**0,800**	-0,085

Source: UNCTAD calculations, based on data retrieved from ITU, M-Lab, UNDP, ILO, Scopus, Patseer, World Bank and https://unctadstat.unctad.org/datacentre/dataviewer/US.FTRI.

Table 14.4: Index to assess the level of relevant industrial capacity for using, adopting and adapting frontier technologies. (min. 0 - max. 1)

Region	Country	2008	2011	2015	2019	2021	Change
Western Europe	AT	**0,680**	0,038	0,036	-0,034	**0,800**	0,120
Western Europe	BE	**0,733**	0,053	0,016	-0,033	**0,800**	0,067
Western Europe	FR	**0,754**	0,049	0,025	-0,037	**0,800**	0,046
Western Europe	DE	**0,787**	0,030	0,019	-0,019	**0,900**	0,113
Western Europe	IE	**1,000**	0,000	0,000	0,000	**1,000**	0,000
Western Europe	LU	**0,871**	-0,039	-0,041	-0,066	**0,800**	-0,071
Western Europe	NL	**0,843**	0,000	0,010	-0,018	**0,900**	0,057
Western Europe	CH	**0,888**	0,008	0,000	-0,016	**0,900**	0,012
Western Europe	UK	**0,835**	0,012	0,000	-0,038	**0,700**	-0,135
Northern Europe	DK	**0,665**	0,036	0,026	0,018	**0,800**	0,135
Northern Europe	FI	**0,792**	0,019	-0,028	-0,054	**0,800**	0,008
Northern Europe	IS	**0,634**	-0,044	-0,071	-0,113	**0,600**	-0,034
Northern Europe	NO	**0,574**	0,073	-0,023	-0,046	**0,700**	0,126
Northern Europe	SE	**0,793**	0,039	0,007	-0,058	**0,900**	0,107
Southern Europe	CY	**0,604**	0,079	0,007	-0,007	**0,800**	0,196
Southern Europe	EL	**0,458**	0,086	0,000	0,006	**0,700**	0,242
Southern Europe	IT	**0,666**	0,040	0,018	-0,025	**0,800**	0,134
Southern Europe	MT	**0,889**	-0,007	-0,046	-0,068	**0,800**	-0,089
Southern Europe	PT	**0,558**	0,014	0,030	-0,017	**0,700**	0,142
Southern Europe	ES	**0,626**	0,058	-0,006	-0,027	**0,800**	0,174
Central and Eastern Europe	BG	**0,499**	0,114	0,023	0,000	**0,800**	0,301
Central and Eastern Europe	HR	**0,519**	0,094	-0,008	0,008	**0,700**	0,181
Central and Eastern Europe	CZ	**0,709**	0,041	0,031	-0,013	**0,800**	0,091
Central and Eastern Europe	EE	**0,620**	0,077	0,038	-0,038	**0,800**	0,180
Central and Eastern Europe	HU	**0,777**	0,047	-0,023	-0,028	**0,800**	0,023
Central and Eastern Europe	LV	**0,586**	0,089	0,020	-0,011	**0,800**	0,214
Central and Eastern Europe	LT	**0,496**	0,066	0,021	0,016	**0,700**	0,204
Central and Eastern Europe	PL	**0,590**	0,130	-0,010	-0,018	**0,800**	0,210
Central and Eastern Europe	RO	**0,558**	0,164	-0,039	-0,014	**0,700**	0,142
Central and Eastern Europe	SK	**0,670**	0,048	0,049	-0,032	**0,800**	0,130
Central and Eastern Europe	SI	**0,636**	0,061	0,024	-0,022	**0,800**	0,164
Oceania	NZ	**0,478**	0,070	-0,041	-0,013	**0,600**	0,122
Oceania	AU	**0,535**	0,029	-0,018	-0,020	**0,600**	0,065
North America	CA	**0,737**	0,016	-0,014	-0,037	**0,800**	0,063
North America	US	**0,797**	-0,001	-0,008	-0,033	**0,800**	0,003

Source: UNCTAD calculations, based on data retrieved from ITU, M-Lab, UNDP, ILO, Scopus, Patseer, World Bank and https://unctadstat.unctad.org/datacentre/dataviewer/US.FTRI.

Table 14.5: Index to assess the availability of finance to the private sector frontier technologies (min. 0 - max.1)

Region	Country	2008	2011	2015	2019	2021	Change
Western Europe	AT	**0,793**	0,012	-0,060	0,026	**0,800**	0,007
Western Europe	BE	**0,728**	-0,047	-0,035	0,075	**0,700**	-0,028
Western Europe	FR	**0,783**	0,016	-0,036	0,061	**0,800**	0,017
Western Europe	DE	**0,802**	-0,021	-0,059	0,034	**0,800**	-0,002
Western Europe	IE	**0,905**	-0,032	-0,147	-0,125	**0,600**	-0,305
Western Europe	LU	**0,777**	0,009	-0,035	0,078	**0,800**	0,023
Western Europe	NL	**0,835**	0,002	-0,023	0,012	**0,800**	-0,035
Western Europe	CH	**0,903**	0,007	-0,007	0,042	**0,900**	-0,003
Western Europe	UK	**0,920**	0,027	-0,097	0,033	**0,900**	-0,020
Northern Europe	DK	**0,937**	0,019	-0,047	0,018	**0,900**	-0,037
Northern Europe	FI	**0,751**	0,029	-0,020	0,038	**0,800**	0,049
Northern Europe	IS	**1,000**	-0,086	-0,150	0,029	**0,800**	-0,200
Northern Europe	NO	**0,824**	0,041	-0,026	0,062	**0,900**	0,076
Northern Europe	SE	**0,830**	0,024	-0,014	0,039	**0,900**	0,070
Southern Europe	CY	**0,933**	0,067	0,000	-0,108	**0,800**	-0,133
Southern Europe	EL	**0,773**	0,060	-0,020	-0,028	**0,800**	0,027
Southern Europe	IT	**0,766**	0,026	-0,044	0,002	**0,800**	0,034
Southern Europe	MT	**0,825**	0,023	-0,074	-0,024	**0,800**	-0,025
Southern Europe	PT	**0,883**	0,025	-0,068	-0,033	**0,800**	-0,083
Southern Europe	ES	**0,918**	0,012	-0,089	-0,030	**0,800**	-0,118
Central and Eastern Europe	BG	**0,695**	0,027	-0,070	0,001	**0,700**	0,005
Central and Eastern Europe	HR	**0,706**	0,017	-0,038	-0,012	**0,700**	-0,006
Central and Eastern Europe	CZ	**0,608**	0,029	-0,027	0,047	**0,700**	0,092
Central and Eastern Europe	EE	**0,771**	0,019	-0,109	0,017	**0,700**	-0,071
Central and Eastern Europe	HU	**0,675**	0,021	-0,123	-0,025	**0,600**	-0,075
Central and Eastern Europe	LV	**0,798**	-0,001	-0,181	-0,044	**0,600**	-0,198
Central and Eastern Europe	LT	**0,696**	-0,007	-0,127	0,035	**0,600**	-0,096
Central and Eastern Europe	PL	**0,599**	0,048	-0,025	0,038	**0,700**	0,101
Central and Eastern Europe	RO	**0,581**	0,017	-0,101	-0,006	**0,500**	-0,081
Central and Eastern Europe	SK	**0,601**	0,027	-0,018	0,089	**0,700**	0,099
Central and Eastern Europe	SI	**0,736**	0,036	-0,141	-0,018	**0,600**	-0,136
Oceania	NZ	**0,886**	0,002	-0,014	0,049	**0,900**	0,014
Oceania	AU	**0,848**	0,011	-0,022	0,055	**0,900**	0,052
North America	CA	**0,853**	0,004	-0,028	0,035	**0,800**	-0,053
North America	US	**0,961**	-0,010	-0,014	0,025	**1,000**	0,039

Source: UNCTAD calculations, based on data from ITU, M-Lab, UNDP, ILO, Scopus, Patseer, World Bank and https://unctadstat.unctad.org/datacentre/dataviewer/US.FTRI.

Table 14.6: Frontier technology readiness. Index to assess country's readiness for using, adopting and adapting frontier technologies (min. 0 - max. 1)

Region	Country	2008	2011	2015	2019	2021	Change
Western Europe	AT	**0,78**	0,03	-0,01	0,00	**0,80**	0,02
Western Europe	BE	**0,85**	0,00	0,08	-0,02	**0,90**	0,05
Western Europe	FR	**0,85**	0,06	0,01	-0,03	**0,90**	0,05
Western Europe	DE	**0,94**	0,02	-0,01	-0,03	**0,90**	-0,04
Western Europe	IE	**0,86**	0,05	0,05	-0,03	**0,90**	0,04
Western Europe	LU	**0,78**	0,05	0,02	0,03	**0,90**	0,12
Western Europe	NL	**0,95**	-0,01	0,02	-0,02	**0,90**	-0,05
Western Europe	CH	**0,93**	-0,02	0,03	0,03	**0,90**	-0,03
Western Europe	UK	**1,00**	0,00	0,00	-0,04	**0,90**	-0,10
Northern Europe	DK	**0,87**	0,02	0,02	0,00	**0,90**	0,03
Northern Europe	FI	**0,85**	0,03	0,00	-0,01	**0,90**	0,05
Northern Europe	IS	**0,82**	-0,03	-0,05	-0,03	**0,80**	-0,02
Northern Europe	NO	**0,83**	-0,01	0,02	0,03	**0,90**	0,07
Northern Europe	SE	**0,90**	0,02	0,06	-0,02	**1,00**	0,10
Southern Europe	CY	**0,57**	0,03	0,06	0,03	**0,70**	0,13
Southern Europe	EL	**0,59**	0,04	0,03	0,00	**0,70**	0,11
Southern Europe	IT	**0,81**	-0,01	-0,01	-0,02	**0,80**	-0,01
Southern Europe	MT	**0,67**	0,02	0,04	-0,04	**0,80**	0,13
Southern Europe	PT	**0,69**	0,04	0,01	-0,03	**0,80**	0,11
Southern Europe	ES	**0,77**	0,01	0,00	0,05	**0,90**	0,13
Central and Eastern Europe	BG	**0,54**	0,08	0,00	-0,05	**0,70**	0,16
Central and Eastern Europe	HR	**0,55**	0,03	0,01	-0,02	**0,70**	0,15
Central and Eastern Europe	CZ	**0,72**	-0,01	0,02	0,03	**0,80**	0,08
Central and Eastern Europe	EE	**0,68**	0,02	0,01	0,01	**0,80**	0,12
Central and Eastern Europe	HU	**0,69**	0,01	-0,05	0,02	**0,70**	0,01
Central and Eastern Europe	LV	**0,66**	0,04	-0,05	-0,01	**0,70**	0,04
Central and Eastern Europe	LT	**0,59**	0,04	0,04	-0,02	**0,70**	0,11
Central and Eastern Europe	PL	**0,60**	0,03	0,09	0,01	**0,80**	0,20
Central and Eastern Europe	RO	**0,54**	0,15	-0,03	-0,06	**0,70**	0,16
Central and Eastern Europe	SK	**0,61**	0,04	-0,01	0,05	**0,70**	0,09
Central and Eastern Europe	SI	**0,69**	0,01	-0,03	0,02	**0,80**	0,11
Oceania	NZ	**0,82**	0,04	-0,06	-0,01	**0,80**	-0,02
Oceania	AU	**0,81**	0,04	0,02	0,02	**0,90**	0,09
North America	CA	**0,86**	0,00	0,03	-0,01	**0,90**	0,04
North America	US	**1,00**	-0,05	0,02	0,03	**1,00**	0,00

Source: UNCTAD calculations, based on data retrieved from ITU, M-Lab, UNDP, ILO, Scopus, Patseer, World Bank and https://unctadstat.unctad.org/datacentre/dataviewer/US.FTRI.

Table 15.1: Innovation Inputs Scores from Global Innovation Index (min 0 max 100)

Region	Country	2008	2013	2016	2019	2021	Change
Western Europe	AT	**51,7**	▲ 8,90	▲ 0,30	▲ 1,90	**62,1**	▲ 10,40
Western Europe	BE	**50,0**	▲ 9,50	▼ -1,30	▲ 2,50	**59,7**	▲ 9,70
Western Europe	FR	**49,2**	▲ 9,80	▲ 3,60	▲ 0,90	**61,5**	▲ 12,30
Western Europe	DE	**54,5**	▲ 5,30	▲ 2,10	▲ 3,40	**63,0**	▲ 8,50
Western Europe	IE	**49,9**	▲ 14,20	▼ -1,70	▼ -0,30	**59,2**	▲ 9,30
Western Europe	LU	**48,4**	▲ 11,50	▼ -3,30	▲ 1,10	**55,8**	▲ 7,40
Western Europe	NL	**53,1**	▲ 11,10	▼ -0,20	▲ 1,40	**63,7**	▲ 10,60
Western Europe	CH	**55,9**	▲ 10,60	▲ 1,90	▲ 2,60	**68,9**	▲ 13,00
Western Europe	UK	**56,0**	▲ 12,20	▼ -0,70	▲ 0,70	**66,5**	▲ 10,50
Northern Europe	DK	**57,3**	▲ 9,00	▲ 0,80	▲ 2,20	**67,0**	▲ 9,70
Northern Europe	FI	**53,6**	▲ 13,10	▲ 1,80	▼ -0,50	**67,0**	▲ 13,40
Northern Europe	IS	**51,6**	▲ 8,10	▼ -3,10	▲ 2,50	**59,7**	▲ 8,10
Northern Europe	NO	**50,5**	▲ 12,90	▼ -1,40	▲ 3,30	**63,5**	▲ 13,00
Northern Europe	SE	**56,4**	▲ 11,50	▲ 0,60	▲ 1,90	**69,6**	▲ 13,20
Southern Europe	CY	**39,7**	▲ 13,40	▼ -1,20	▲ 3,60	**53,1**	▲ 13,40
Southern Europe	EL	**36,5**	▲ 9,20	▲ 3,70	▲ 0,80	**48,6**	▲ 12,10
Southern Europe	IT	**38,8**	▲ 14,50	▲ 0,80	▲ 0,60	**52,6**	▲ 13,80
Southern Europe	MT	**43,0**	▲ 7,20	▲ 0,80	▲ 3,60	**54,1**	▲ 11,10
Southern Europe	PT	**42,6**	▲ 9,50	▲ 1,00	▲ 1,60	**52,9**	▲ 10,30
Southern Europe	ES	**44,0**	▲ 13,90	▼ -0,60	▲ 0,00	**54,6**	▲ 10,60
Central and Eastern Europe	BG	**33,7**	▲ 10,30	▲ 1,30	▲ 2,80	**46,2**	▲ 12,50
Central and Eastern Europe	HR	**35,9**	▲ 10,20	▲ 0,30	▲ 1,00	**47,0**	▲ 11,10
Central and Eastern Europe	CZ	**41,2**	▲ 12,20	▲ 0,90	▲ 1,10	**53,8**	▲ 12,60
Central and Eastern Europe	EE	**46,0**	▲ 9,70	▼ -1,50	▲ 1,90	**58,0**	▲ 12,00
Central and Eastern Europe	HU	**38,9**	▲ 9,60	▲ 0,40	▲ 1,40	**50,2**	▲ 11,30
Central and Eastern Europe	LV	**38,0**	▲ 13,10	▼ -1,40	▲ 1,60	**49,2**	▲ 11,20
Central and Eastern Europe	LT	**40,7**	▲ 8,20	▲ 2,30	▼ -0,60	**50,0**	▲ 9,30
Central and Eastern Europe	PL	**35,8**	▲ 12,00	▲ 0,90	▲ 2,30	**49,6**	▲ 13,80
Central and Eastern Europe	RO	**33,7**	▲ 9,10	▲ 1,20	▲ 1,50	**44,2**	▲ 10,50
Central and Eastern Europe	SK	**41,0**	▲ 7,30	▼ -0,30	▲ 0,50	**46,7**	▲ 5,70
Central and Eastern Europe	SI	**41,4**	▲ 11,80	▼ -0,20	▲ 1,10	**54,6**	▲ 13,20
Oceania	NZ	**50,3**	▲ 12,50	▼ -0,20	▲ 0,50	**60,2**	▲ 9,90
Oceania	AU	**52,1**	▲ 12,00	▲ 0,80	▼ -0,60	**62,2**	▲ 10,10
North America	CA	**54,8**	▲ 10,00	▲ 0,60	▲ 1,00	**66,2**	▲ 11,40
North America	US	**57,2**	▲ 12,00	▼ -0,50	▲ 2,10	**69,1**	▲ 11,90

Source: Global Innovation Index (2008-2023)

Table 15.2: Innovation Outputs Scores from Global Innovation Index (min 0 max 100)

Region	Country	2008	2013	2016	2019	2021	Change
Western Europe	AT	**37,4**	▲ 5,80	▲ 1,20	▼ -5,30	**39,6**	▲ 2,20
Western Europe	BE	**37,0**	▲ 8,50	▲ 0,20	▼ -6,10	**38,7**	▲ 1,70
Western Europe	FR	**37,8**	▲ 8,80	▼ -1,10	▼ -0,50	**48,5**	▲ 10,70
Western Europe	DE	**45,4**	▲ 6,50	▲ 2,10	▼ -2,90	**51,7**	▲ 6,30
Western Europe	IE	**36,1**	▲ 15,60	▲ 3,90	▼ -5,50	**42,1**	▲ 6,00
Western Europe	LU	**38,9**	▲ 14,30	▲ 4,40	▼ -8,40	**42,3**	▲ 3,40
Western Europe	NL	**39,6**	▲ 18,50	▼ -5,60	▲ 5,00	**53,5**	▲ 13,90
Western Europe	CH	**38,6**	▲ 28,10	▼ -2,50	▼ -0,70	**62,0**	▲ 23,40
Western Europe	UK	**40,4**	▲ 13,90	▲ 2,00	▼ -1,90	**53,1**	▲ 12,70
Northern Europe	DK	**36,4**	▲ 14,00	▼ -0,60	▼ -2,30	**47,7**	▲ 11,30
Northern Europe	FI	**37,7**	▲ 14,70	▼ -1,10	▲ 0,30	**49,7**	▲ 12,00
Northern Europe	IS	**35,2**	▲ 17,90	▲ 2,20	▼ -11,30	**43,9**	▲ 8,70
Northern Europe	NO	**38,9**	▲ 9,00	▼ -5,90	▼ -3,50	**37,4**	▼ -1,50
Northern Europe	SE	**40,5**	▲ 14,40	▲ 3,80	▼ -1,80	**56,6**	▲ 16,10
Southern Europe	CY	**28,2**	▲ 17,40	▼ -4,80	▲ 0,30	**40,3**	▲ 12,10
Southern Europe	EL	**26,8**	▲ 2,90	▲ 0,40	▼ -2,50	**24,0**	▼ -2,80
Southern Europe	IT	**34,3**	▲ 8,10	▼ -2,10	▼ -2,40	**38,8**	▲ 4,50
Southern Europe	MT	**27,9**	▲ 25,50	▼ -3,50	▼ -6,50	**40,2**	▲ 12,30
Southern Europe	PT	**27,3**	▲ 10,80	▲ 1,70	▼ -5,20	**35,6**	▲ 8,30
Southern Europe	ES	**32,2**	▲ 8,80	▲ 0,10	▼ -2,70	**36,2**	▲ 4,00
Central and Eastern Europe	BG	**23,2**	▲ 15,50	▼ -1,20	▼ -4,90	**38,5**	▲ 15,30
Central and Eastern Europe	HR	**24,6**	▲ 13,20	▼ -7,60	▼ -1,90	**27,5**	▲ 2,90
Central and Eastern Europe	CZ	**31,7**	▲ 11,60	▲ 1,20	▼ -1,10	**44,3**	▲ 12,60
Central and Eastern Europe	EE	**27,8**	▲ 17,70	▲ 3,80	▼ -5,50	**41,8**	▲ 14,00
Central and Eastern Europe	HU	**27,9**	▲ 17,50	▼ -4,90	▼ -1,80	**35,2**	▲ 7,30
Central and Eastern Europe	LV	**24,0**	▲ 15,40	▼ -0,50	▼ -3,70	**30,8**	▲ 6,80
Central and Eastern Europe	LT	**27,9**	▲ 5,90	▼ -1,50	▲ 0,00	**29,7**	▲ 1,80
Central and Eastern Europe	PL	**27,2**	▲ 5,20	▼ -0,70	▲ 0,00	**30,1**	▲ 2,90
Central and Eastern Europe	RO	**24,8**	▲ 13,00	▼ -6,00	▼ -3,80	**27,0**	▲ 2,20
Central and Eastern Europe	SK	**30,9**	▲ 5,30	▼ -0,80	▲ 0,20	**33,7**	▲ 2,80
Central and Eastern Europe	SI	**30,4**	▲ 11,00	▼ -2,50	▼ -2,50	**33,7**	▲ 3,30
Oceania	NZ	**29,1**	▲ 17,10	▼ -0,40	▼ -9,80	**34,8**	▲ 5,70
Oceania	AU	**33,4**	▲ 8,60	▼ -0,70	▼ -5,00	**34,4**	▲ 1,00
North America	CA	**37,7**	▲ 12,70	▼ -6,40	▼ -2,60	**40,1**	▲ 2,40
North America	US	**48,4**	▲ 3,00	▲ 2,70	▼ -1,50	**53,5**	▲ 5,10

Source: Global Innovation Index (2008-2023)

Table 15.3: Knowledge and Technology Outputs Scores from Global Innovation Index Report (min 0 max 100)

Region	Country	2008	2013	2016	2019	2021	Change
Western Europe	AT	**43,8**	-7,00	2,60	-2,70	**40,3**	-3,50
Western Europe	BE	**42,9**	-1,10	2,20	-3,20	**42,3**	-0,60
Western Europe	FR	**43,6**	0,70	-3,00	3,70	**44,3**	0,70
Western Europe	DE	**49,8**	-0,70	2,50	1,10	**53,3**	3,50
Western Europe	IE	**42,5**	13,10	2,30	-1,00	**47,6**	5,10
Western Europe	LU	**41,8**	-9,10	16,00	-6,50	**30,1**	-11,70
Western Europe	NL	**45,7**	8,20	-9,80	17,70	**54,8**	9,10
Western Europe	CH	**49,8**	11,70	5,50	3,30	**63,9**	14,10
Western Europe	UK	**45,9**	5,20	-0,90	6,40	**52,3**	6,40
Northern Europe	DK	**44,2**	-2,30	4,50	0,00	**47,6**	3,40
Northern Europe	FI	**46,7**	4,10	1,30	3,00	**56,5**	9,80
Northern Europe	IS	**37,2**	0,10	3,90	-3,60	**37,0**	-0,20
Northern Europe	NO	**38,8**	-2,70	0,10	-2,50	**35,4**	-3,40
Northern Europe	SE	**48,5**	5,60	9,80	-2,10	**60,3**	11,80
Southern Europe	CY	**31,0**	6,50	4,90	-1,20	**39,4**	8,40
Southern Europe	EL	**24,9**	-1,40	1,40	0,20	**25,2**	0,30
Southern Europe	IT	**41,3**	0,40	-3,00	0,20	**41,7**	0,40
Southern Europe	MT	**32,6**	12,20	-6,50	-6,40	**28,3**	-4,30
Southern Europe	PT	**31,3**	-2,80	3,90	-2,60	**31,9**	0,60
Southern Europe	ES	**33,7**	3,10	1,80	-1,40	**36,2**	2,50
Central and Eastern Europe	BG	**24,2**	10,80	-2,90	-0,70	**36,0**	11,80
Central and Eastern Europe	HR	**26,5**	7,40	-7,40	-0,90	**26,9**	0,40
Central and Eastern Europe	CZ	**35,1**	3,20	4,50	1,00	**48,2**	13,10
Central and Eastern Europe	EE	**30,1**	3,60	10,20	-7,90	**38,4**	8,30
Central and Eastern Europe	HU	**32,8**	12,10	-0,50	-1,60	**39,5**	6,70
Central and Eastern Europe	LV	**23,3**	8,80	-0,50	-4,10	**27,8**	4,50
Central and Eastern Europe	LT	**30,1**	-3,50	-0,90	-1,30	**25,8**	-4,30
Central and Eastern Europe	PL	**29,5**	-0,50	-1,80	3,70	**30,6**	1,10
Central and Eastern Europe	RO	**31,0**	9,30	-9,30	-0,70	**31,8**	0,80
Central and Eastern Europe	SK	**30,0**	3,30	-1,00	1,70	**34,3**	4,30
Central and Eastern Europe	SI	**34,8**	1,60	-2,50	-3,20	**33,0**	-1,80
Oceania	NZ	**30,7**	6,50	1,10	-8,50	**29,7**	-1,00
Oceania	AU	**32,9**	-2,00	3,40	-2,70	**29,1**	-3,80
North America	CA	**40,0**	4,40	-3,50	0,40	**38,3**	-1,70
North America	US	**47,7**	5,90	2,90	3,20	**59,2**	11,50

Source: Global Innovation Index (2008-2023)

Table 15.4: Creative Outputs Scores from Global Innovation Index Report (min 0 max 100) 2011-2021

Region	Country	2011	2013		2016		2019		2021		Change
Western Europe	AT	**51,3**	▲	0,50	▲	0,00	▼	-8,10	**39,0**	▼	-10,00
Western Europe	BE	**50,4**	▲	6,90	▼	-1,70	▼	-9,00	**35,1**	▼	-7,20
Western Europe	FR	**50,8**	▲	4,30	▲	0,80	▼	-4,80	**52,6**	▲	7,90
Western Europe	DE	**52,8**	▲	3,00	▲	1,60	▼	-6,70	**50,0**	▼	-1,70
Western Europe	IE	**55,0**	▲	13,70	▲	5,50	▼	-10,10	**36,7**	▲	2,50
Western Europe	LU	**69,0**	▲	34,20	▼	-7,30	▼	-10,20	**54,4**	▲	14,90
Western Europe	NL	**61,9**	▲	11,70	▼	-1,30	▼	-7,80	**52,2**	▲	1,60
Western Europe	CH	**64,8**	▲	17,40	▼	-10,40	▼	-4,80	**60,2**	▲	5,80
Western Europe	UK	**60,5**	▲	13,20	▲	5,00	▼	-10,30	**54,0**	▲	9,70
Northern Europe	DK	**53,0**	▲	6,40	▼	-5,50	▼	-4,70	**47,7**	▼	-4,70
Northern Europe	FI	**52,2**	▲	11,80	▼	-3,30	▼	-2,50	**42,9**	▲	0,80
Northern Europe	IS	**72,4**	▲	26,70	▲	0,50	▼	-19,10	**50,7**	▲	8,40
Northern Europe	NO	**51,7**	▲	9,10	▼	-11,80	▼	-4,70	**39,3**	▼	-11,30
Northern Europe	SE	**55,1**	▼	-1,10	▼	-2,20	▼	-1,50	**52,9**	▼	-3,80
Southern Europe	CY	**44,6**	▲	16,30	▼	-14,50	▲	1,90	**41,3**	▲	3,90
Southern Europe	EL	**37,5**	▲	4,70	▼	-0,60	▼	-5,20	**22,9**	▼	-8,30
Southern Europe	IT	**37,6**	▲	3,80	▼	-1,20	▼	-5,00	**35,8**	▼	-3,40
Southern Europe	MT	**59,8**	▲	39,30	▼	-0,60	▼	-6,40	**52,0**	▲	29,30
Southern Europe	PT	**45,7**	▲	3,60	▼	-0,40	▼	-7,90	**39,3**	▼	-4,80
Southern Europe	ES	**42,4**	▲	4,10	▼	-1,50	▼	-3,90	**36,2**	▼	-4,80
Central and Eastern Europe	BG	**41,1**	▲	4,30	▲	0,60	▼	-9,20	**41,1**	▲	3,00
Central and Eastern Europe	HR	**40,5**	▲	4,90	▼	-7,70	▼	-2,90	**28,2**	▼	-8,50
Central and Eastern Europe	CZ	**50,3**	▲	1,40	▼	-2,00	▼	-3,10	**40,3**	▼	-6,50
Central and Eastern Europe	EE	**55,6**	▲	8,40	▼	-2,60	▼	-3,00	**45,3**	▼	-3,60
Central and Eastern Europe	HU	**40,7**	▲	0,90	▼	-9,30	▼	-1,90	**30,9**	▼	-14,00
Central and Eastern Europe	LV	**46,3**	▲	5,70	▼	-0,50	▼	-3,40	**33,8**	▼	-7,20
Central and Eastern Europe	LT	**41,0**	▲	3,90	▼	-2,10	▲	1,30	**33,6**	▼	-3,60
Central and Eastern Europe	PL	**35,4**	▲	0,10	▲	0,40	▼	-3,90	**29,6**	▼	-6,20
Central and Eastern Europe	RO	**32,1**	▲	2,40	▼	-2,80	▼	-6,80	**22,2**	▼	-10,80
Central and Eastern Europe	SK	**40,4**	▲	6,00	▼	-0,50	▼	-1,50	**33,0**	▼	-0,10
Central and Eastern Europe	SI	**49,4**	▲	2,60	▼	-2,40	▼	-1,90	**34,3**	▼	-9,50
Oceania	NZ	**55,4**	▲	9,50	▼	-1,80	▼	-11,10	**39,8**	▼	-5,80
Oceania	AU	**56,5**	▲	12,50	▼	-4,90	▼	-7,10	**39,6**	▼	-1,00
North America	CA	**50,9**	▲	2,50	▼	-9,40	▼	-5,70	**41,9**	▼	-12,10
North America	US	**47,8**	▲	6,00	▲	2,40	▼	-6,10	**47,8**	▲	4,60

Source: Global Innovation Index (2008-2023)

Table 15.5: Innovation Efficiency from Global Innovation Index (Ratio Innovation Output Score/Innovation Input Score)

Region	Country	2008	2013	2016	2019	2021	Change
Western Europe	AT	**0,723**	-0,011	0,016	-0,106	**0,638**	-0,086
Western Europe	BE	**0,740**	0,025	0,021	-0,133	**0,648**	-0,092
Western Europe	FR	**0,768**	0,022	-0,063	-0,018	**0,789**	0,020
Western Europe	DE	**0,833**	0,035	0,004	-0,090	**0,821**	-0,012
Western Europe	IE	**0,723**	0,083	0,084	-0,084	**0,711**	-0,012
Western Europe	LU	**0,804**	0,084	0,130	-0,165	**0,758**	-0,046
Western Europe	NL	**0,746**	0,159	-0,085	0,059	**0,840**	0,094
Western Europe	CH	**0,691**	0,312	-0,064	-0,044	**0,900**	0,209
Western Europe	UK	**0,721**	0,075	0,038	-0,036	**0,798**	0,077
Northern Europe	DK	**0,635**	0,125	-0,018	-0,057	**0,712**	0,077
Northern Europe	FI	**0,703**	0,082	-0,037	0,010	**0,742**	0,038
Northern Europe	IS	**0,682**	0,207	0,088	-0,233	**0,735**	0,053
Northern Europe	NO	**0,770**	-0,015	-0,078	-0,088	**0,589**	-0,181
Northern Europe	SE	**0,718**	0,090	0,048	-0,049	**0,813**	0,095
Southern Europe	CY	**0,710**	0,148	-0,073	-0,046	**0,759**	0,049
Southern Europe	EL	**0,734**	-0,084	-0,041	-0,060	**0,494**	-0,240
Southern Europe	IT	**0,884**	-0,089	-0,051	-0,052	**0,738**	-0,146
Southern Europe	MT	**0,649**	0,415	-0,085	-0,184	**0,743**	0,094
Southern Europe	PT	**0,641**	0,090	0,018	-0,117	**0,673**	0,032
Southern Europe	ES	**0,732**	-0,024	0,009	-0,047	**0,663**	-0,069
Central and Eastern Europe	BG	**0,688**	0,191	-0,052	-0,150	**0,833**	0,145
Central and Eastern Europe	HR	**0,685**	0,135	-0,169	-0,054	**0,585**	-0,100
Central and Eastern Europe	CZ	**0,769**	0,041	0,009	-0,036	**0,823**	0,054
Central and Eastern Europe	EE	**0,604**	0,213	0,093	-0,129	**0,721**	0,116
Central and Eastern Europe	HU	**0,717**	0,219	-0,108	-0,059	**0,701**	-0,016
Central and Eastern Europe	LV	**0,632**	0,139	0,012	-0,097	**0,626**	-0,006
Central and Eastern Europe	LT	**0,686**	0,006	-0,060	0,007	**0,594**	-0,092
Central and Eastern Europe	PL	**0,760**	-0,082	-0,027	-0,029	**0,607**	-0,153
Central and Eastern Europe	RO	**0,736**	0,147	-0,160	-0,107	**0,611**	-0,125
Central and Eastern Europe	SK	**0,754**	-0,004	-0,012	-0,003	**0,722**	-0,032
Central and Eastern Europe	SI	**0,734**	0,044	-0,044	-0,061	**0,617**	-0,117
Oceania	NZ	**0,579**	0,157	-0,004	-0,161	**0,578**	0,000
Oceania	AU	**0,641**	0,014	-0,019	-0,072	**0,553**	-0,088
North America	CA	**0,688**	0,090	-0,105	-0,049	**0,606**	-0,082
North America	US	**0,846**	-0,103	0,045	-0,045	**0,774**	-0,072

Source: Global Innovation Index (2008-2023)

Table 15.6: Global Innovation Index Scores from Global Innovation Index Report (min 0 max 100)

Region	Country	2008	2013		2016		2019		2021	Change
Western Europe	AT	**44,6**	▲	7,30	▲	0,70	▼	-1,70	**50,9**	▲ 6,30
Western Europe	BE	**43,5**	▲	9,00	▼	-0,50	▼	-1,80	**49,2**	▲ 5,70
Western Europe	FR	**43,5**	▲	9,30	▲	1,20	▲	0,20	**55,0**	▲ 11,50
Western Europe	DE	**49,9**	▲	5,90	▲	2,10	▲	0,30	**57,3**	▲ 7,40
Western Europe	IE	**43,0**	▲	14,90	▲	1,10	▼	-2,90	**50,7**	▲ 7,70
Western Europe	LU	**43,7**	▲	12,90	▲	0,50	▼	-3,60	**49,0**	▲ 5,30
Western Europe	NL	**46,4**	▲	14,70	▼	-2,80	▲	3,10	**58,6**	▲ 12,20
Western Europe	CH	**47,3**	▲	19,30	▼	-0,30	▲	0,90	**65,5**	▲ 18,20
Western Europe	UK	**48,2**	▲	13,00	▲	0,70	▼	-0,60	**59,8**	▲ 11,60
Northern Europe	DK	**46,9**	▲	11,40	▲	0,20	▼	-0,10	**57,3**	▲ 10,40
Northern Europe	FI	**45,7**	▲	13,80	▲	0,40	▼	-0,10	**58,4**	▲ 12,70
Northern Europe	IS	**43,4**	▲	13,00	▼	-0,40	▼	-4,50	**51,8**	▲ 8,40
Northern Europe	NO	**44,7**	▲	10,90	▼	-3,60	▼	-0,10	**50,4**	▲ 5,70
Northern Europe	SE	**48,4**	▲	13,00	▲	2,20	▲	0,10	**63,1**	▲ 14,70
Southern Europe	CY	**33,9**	▲	15,40	▼	-3,00	▲	2,00	**46,7**	▲ 12,80
Southern Europe	EL	**31,7**	▲	6,00	▲	2,10	▼	-0,90	**36,3**	▲ 4,60
Southern Europe	IT	**36,5**	▲	11,30	▼	-0,60	▼	-0,90	**45,7**	▲ 9,20
Southern Europe	MT	**35,4**	▲	16,40	▼	-1,40	▼	-1,40	**47,1**	▲ 11,70
Southern Europe	PT	**34,9**	▲	10,20	▲	1,30	▼	-1,80	**44,2**	▲ 9,30
Southern Europe	ES	**38,1**	▲	11,30	▼	-0,20	▼	-1,30	**45,4**	▲ 7,30
Central and Eastern Europe	BG	**28,5**	▲	12,80	▲	0,10	▼	-1,10	**42,4**	▲ 13,90
Central and Eastern Europe	HR	**30,3**	▲	11,60	▼	-3,60	▼	-0,50	**37,3**	▲ 7,00
Central and Eastern Europe	CZ	**36,4**	▲	12,00	▲	1,00	▲	0,00	**49,0**	▲ 12,60
Central and Eastern Europe	EE	**36,9**	▲	13,70	▲	1,10	▼	-1,70	**49,9**	▲ 13,00
Central and Eastern Europe	HU	**33,4**	▲	13,50	▼	-2,20	▼	-0,20	**42,7**	▲ 9,30
Central and Eastern Europe	LV	**31,0**	▲	14,20	▼	-0,90	▼	-1,10	**40,0**	▲ 9,00
Central and Eastern Europe	LT	**34,3**	▲	7,10	▲	0,40	▼	-0,30	**39,9**	▲ 5,60
Central and Eastern Europe	PL	**31,5**	▲	8,60	▲	0,10	▲	1,10	**39,9**	▲ 8,40
Central and Eastern Europe	RO	**29,2**	▲	11,10	▼	-2,40	▼	-1,10	**35,6**	▲ 6,40
Central and Eastern Europe	SK	**35,9**	▲	6,30	▼	-0,50	▲	0,30	**40,2**	▲ 4,30
Central and Eastern Europe	SI	**35,9**	▲	11,40	▼	-1,30	▼	-0,70	**44,1**	▲ 8,20
Oceania	NZ	**39,7**	▲	14,80	▼	-0,30	▼	-4,60	**47,5**	▲ 7,80
Oceania	AU	**42,7**	▲	10,40	▲	0,00	▼	-2,80	**48,3**	▲ 5,60
North America	CA	**46,3**	▲	11,30	▼	-2,90	▼	-0,80	**53,1**	▲ 6,80
North America	US	**52,8**	▲	7,50	▲	1,10	▲	0,30	**61,3**	▲ 8,50

Source: Global Innovation Index (2008-2023)

4. SOCIAL SECURITY, EMPLOYMENT, INCOME AND WEALTH

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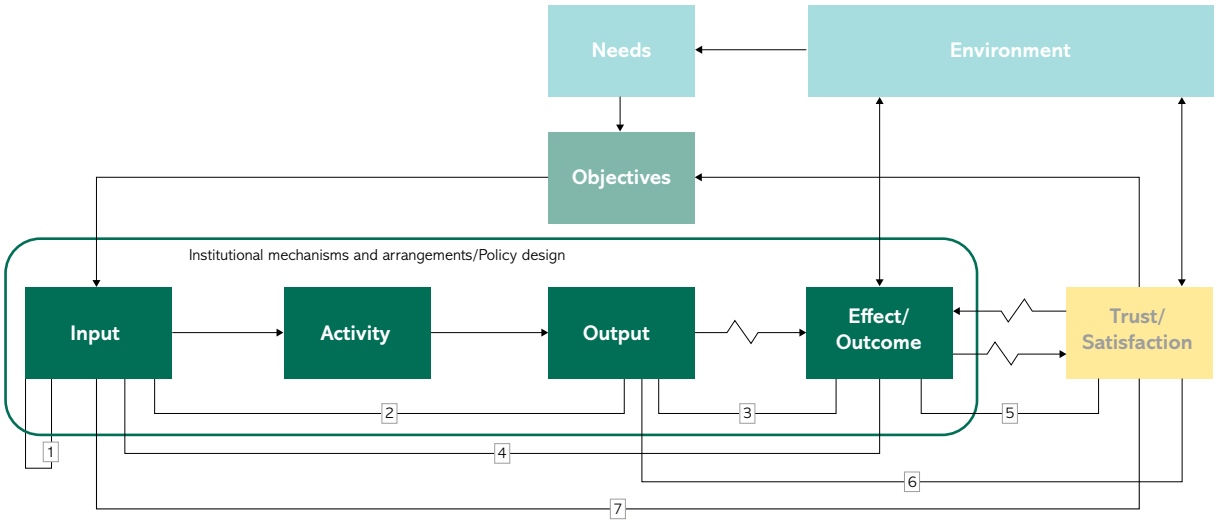
4.1. INTRODUCTION

This chapter deals with four major areas that define important dimensions of people's well-being: social security, employment, income, and wealth. Public policy, whose effectiveness and efficiency are the core subjects of this study, influences all four elements but cannot determine their development completely as other factors are relevant, too. Among these, global economic development (global demand and world market prices) and demography are the most important ones. There are other areas such as education, health and housing which co-determine the level and changes of our four areas but are dealt with by separate sub-studies.

These four areas will be analysed in two sections. The first section will cover employment, income and wealth that are the result of market forces rather than direct state activities. However, government policies can influence the development of the (market) economy, and the distribution of the value created by it. The first section will evaluate the effectiveness and efficiency of these policies. In the second section, the performance of social security schemes will be assessed. Here, government policies must cope not only with the drawbacks of markets but with issues of demography and health by providing support to old, sick, and disabled people. This second section continues and updates the previous study by the Netherlands Institute for Social Research (NISR/SCP; Putman et al., 2015). Generally, we will use the framework that has been used by the previous study (NISR/SCP; Putman et al., 2015):



This implies that we start with inputs (= government policies) and continue towards the outputs, outcome and the trust/satisfaction of the population.

A short note regarding the tables: The first 28 tables are presented twice in this chapter.[1] Within the text, there are condensed tables covering selected years and visualising (using colours, bars and arrows) rankings among countries. The complete tables with the full dataset for all available years are put in the annex allowing readers to look more closely at the development in specific countries. Data sources include, among others, World Development indicators (World Bank), the International Monetary Fund, the International Labour Organisation (ILO), and, most importantly, the Organisation for Economic Co-operation and Development (OECD) and Eurostat. Unfortunately, the OECD data do not cover five EU member states (Bulgaria, Croatia, Cyprus, Malta, Romania) while Eurostat usually does not include data for countries that are not members of the EU.

[1] Tables 29, 30 and 31 do not show several years and are already condensed in the first place. Therefore, they are not again presented in the annex.

4.2. CONCEPTS

Following this structure, we consider the specific inputs, outputs, and outcomes relevant in the four areas of social security, employment, income, and wealth. We cluster these four areas in two, the first dealing with employment, income, and wealth, the second with social security proper. We chose this division as the first three are mostly driven by market forces, albeit influenced by public policies, while social protection, to a large extent, is provided directly by the state. The inputs considered here are the most important government policies used to influence the development within these areas, basically fiscal, monetary, tax, labour market policies and social spending. In some cases, other policies such as regulatory measures are included. Outputs and outcomes are the level and growth of employment, gross domestic product (GDP) or income, wealth, its distribution, and the level, distribution and evolution of social protection. Governments can influence employment, income and wealth only indirectly as the living standards of most people depend primarily on market developments. In the field of social security, the state provides the income directly to the households concerned. Below, we give an overview of the concepts and possible indicators.

Economic policy	Direct provision
Inputs	
Fiscal and monetary policy	Social spending
Tax policy	Social policies
Labour market policy	
Indicators	
Government deficit (% of GDP)	Social spending (% of GDP), to finance income replacement in periods of:
Interest rate	• old age
Top income tax rate	• unemployment
VAT as % of total tax	• poverty
Minimum wage	• disability
Employment protection legislation (ELP) Score (OECD)	• sickness
	Other benefits (children, housing)
Outputs	
Economic growth and its distribution	Social transfers received
Indicators	
Growth rate of GDP, which can be separated in:	Income replacement (in % of average or previous income) in periods of:
• Growth rate of productivity (GDP/h)	• old age
• Growth rate of hours worked	• unemployment
Market income distribution (Gini)	• poverty
Disposable income distribution (Gini)	• disability
Redistribution (Gini market – Gini disposable)	• sickness
Wage share	• Other transfers (child benefit, housing benefit) (in % of average income)
Wealth distribution	
Outcomes	
Employment	Protection against social risks such as poverty, old age, sickness, unemployment, disability.
Income and wealth and their distribution	
Indicators	
Unemployment rate (indicating job security)	Poverty rate
Employment rate	Percent of population receiving transfers
Trust/Satisfaction	
Trust in government, happiness, life expectancy	
Indicators	
Trust (level and change)	
Satisfaction with life/happiness (level and change)	
Life expectancy (level and change)	

The indicators used in this chapter are mostly ratios or growth rates in order to avoid a wrong impression of government performance when low or high absolute values would just reflect historical circumstances rather than effective policies. Countries such as the United States or Norway have much higher per capita incomes than, for instance, the post-communist countries of Central and Eastern Europe because of their past performance and lucky natural resource endowments. Large countries have a higher GDP than small countries, albeit not per capita. In the end, the scores presented in the conclusion (see Table 30; often flattering relatively poor countries that achieved relatively high growth) are supposed to reflect the performance between 2007 and 2021 while, actually, the levels of wellbeing might be higher in richer countries (see Table 31).

The growth of employment, income and wealth is the paramount goal of economic policy, often enshrined in legislation and mandates of central banks and other state institutions, However, the specific policies to achieve these goals are very much debated among schools of economic thought. The two major competing theories are the classical (market-liberal) theory which believes in the power of markets to provide full employment, and rising income and wealth, and the Keynesian theory, which assumes the possibility of lasting market imbalances that cause unemployment and recessions with declining incomes (and wealth). While the first school of thought considers interventions by the state as harmful and counterproductive, the second sees opportunities for active employment policies (demand management) to fight unemployment and recessions. Given the long-standing and ample academic and political debate around these issues, it is beyond the scope of this study to give a definite answer regarding the merits of these theories[2].

Our pragmatic approach, which reflects the more or less pragmatic consensus of current economic policy thought, assumes that government policies actually can influence market outcomes, at least under certain circumstances[3]. In a situation of large unused capacities of labour and capital, additional demand created by appropriate policies will deliver additional employment and income and not be wasted resulting only in inflation as classical economists might expect. Actually, most countries reacted to the last two major economic crises, the financial crisis of 2008/9 and the pandemic in 2020[4] , with expansionary fiscal and monetary policies.

Another way to interpret these controversies is to look at the supply and the demand side. Growth and employment depend on both factors. Increasing demand without expanding supply leads to inflation while rising supply that does not meet demand is likely to cause recession and/or deflation. The supply side is driven by productivity and labour input, the demand side by spending on investment, consumption and net exports. Expansionary fiscal and monetary policies primarily support demand but promote supply, too. Lower interest rates, for instance, stimulate investment that increases productivity and/or employment. They also might support consumer spending as it is financed by credit. They even can make exports more competitive as they may cause a devaluation of the national currency. Higher demand and output do not only increase employment but can also raise productivity by creating economies of scale and lower unit costs.

While the growth of employment, income and wealth is widely accepted as a goal, the distribution of income and wealth is a much more controversial issue. For many economists, inequality is a necessary feature of an efficient market economy in order to achieve an optimal allocation of labour and capital[5]. More recently, after the financial crisis, concerns about rising inequality have led to a more sceptical view, even among orthodox economists (Cyrano and Fazzari, 2016; Kumhof and Ranciere, 2010; Ostry et al., 2014; Piketty, 2014; Rajan, 2010). Governments can address inequality directly through the tax system and direct transfers to poorer people, and, indirectly, by labour market regulation (e.g. statutory minimum wages) and by improving the income chances of weaker people through education, training and other assistance schemes.

[2] See Arestis and Sawyer, 2003 and Perotti, 2002 for the pre-crisis, cautious view.
[3] See Horton and El-Ganainy 2009 and Bankowski et al. 2021 for the post-crisis pragmatic view.
[4] See Dauderstädt, 2021a.
[5] The locus classicus is Okun (1975).

Social security has become a crucial goal of public policy in most countries, in particular democracies where voters will judge governments by their capacity to provide it. However, governments face difficult choices given budgetary constraints and the, often unintended, side effects of the policies adopted. Social security, for instance, interacts with employment in ambiguous ways: On the one hand, classical economic theory often considers various types of social spending as harmful to employment. Taxes and social security contributions paid by wage earners were considered as discouraging labour market participation: the famous "tax wedge". Such thinking informed many welfare state reforms in the 1990s and early 2000s (Clinton's "From Welfare to Work"; German Hartz 4/Agenda2010 reforms). On the other hand, historically, rising productivity has been translated not only into higher gross domestic product (GDP) but into the reduction of working time (a 35hour workweek, longer vacations, earlier retirement) as demanded by, primarily, trade unions, and considered a source of well-being. There is a trade-off between higher employment, which leads to more production and income, and the desire for more leisure time, which might increase productivity and create new demand. Social transfers and wages (resulting from employment) constitute the lion's share of income. For large parts of the population, in particular pensioners, but also the unemployed, sick, disabled and other welfare recipients, social transfers are the major source of income. For most people who are not recipients of public transfers, employment is the primary source of income, namely wages. Saved income creates wealth and wealth is a source of income and social security. Saving rates (savings as a percentage of income) and, thus, wealth growth are very unequally distributed as people with low incomes such as workers and recipients of public transfers are hardly able to save substantial amounts. Most wealth results from accumulated profits or inheritance. All these interactions have to be considered.

Social security in the narrow sense depends to a very large extent on the direct provision of benefits by the government. In this context, social security is understood as the protection from income loss in periods of old age, unemployment, disability, sickness and poverty when people lack the income they receive through market activities, primarily wages. Historically, the system of social protection, usually called welfare state, has developed different patterns with different systems of financing, coverage and ultimate goals. Some rely more on taxes, some on wage-based social security contributions. Some aim at preventing poverty, some at maintaining social status[6]. To a large extent, the challenges to social protection, such as unemployment and poverty, emerge from the workings of the market economy.

Assessing effectiveness of these policies implies comparing the use of the respective policies with the results in terms of growth and poverty. Efficiency will be even harder to evaluate as it compares not only the changes as such but the quantitative relation between the cost of inputs and the value of outputs/outcomes. In the end, the impact of government policies on the final goals, namely life expectancy, happiness and trust in government, is to be assessed.

4.3. EMPLOYMENT, INCOME AND WEALTH

This section tries to evaluate the impact of government policies on the crucial economic features, namely employment, income, and wealth, which largely determine the welfare of the population.

4.3.1. Inputs: Fiscal, monetary, tax and labour market policies

The most important policies to influence employment and growth are the budget deficit and the interest rate, as explained above in the section on "concepts". As tables 1 and 2 show, governments and central banks of most countries reacted to the financial crisis in 2008/09 with expansionary fiscal and monetary policies. The budget deficit increased on average by 3.6 percentage points between 2007 and 2010 (see Table 1, 3rd column). The cumulative deficits that increased the sovereign debt accordingly amounted, on average, to more than ten percentage points during the crisis. The strongest rises were due to rescue activities for the banking sector (Ireland and Iceland being the prominent cases). The most frugal countries have been the Scandinavian countries plus Luxembourg and Switzerland. After 2011, possibly driven by concerns about rising debt, many governments reduced their deficits, lowering the average borrowing requirement to 0.1% in 2018.

[6] For a short introduction see the respective chapter in the previous study (Putman et al., 2015).

Table 1: General government net lending/borrowing (Percent of GDP)

Region	Country	2007	2010	Average 2007-2010	2015	2021	Average 2015-2021	2022	Average 2007-2022
Western Europe	Austria	-1,4	-4,5	-3,1	-1,0	-5,9	-4,9	-2,7	-2,6
Western Europe	Belgium	0,1	-4,1	-4,2	-2,4	-5,5	-3,1	-4,7	-3,3
Western Europe	France	-2,6	-6,9	-4,3	-3,6	-6,4	-2,8	-5,1	-4,6
Western Europe	Germany	0,3	-4,4	-4,6	1,0	-3,7	-4,7	-3,3	-0,8
Western Europe	Ireland	0,3	-32,1	-32,4	-2,0	-1,7	0,4	0,4	-5,9
Western Europe	Luxembourg	4,4	-0,3	-4,6	1,3	0,9	-0,4	-1,1	1,0
Western Europe	Netherlands	-0,2	-5,3	-5,1	-2,1	-2,6	-0,5	-0,8	-1,8
Western Europe	Switzerland	1,6	0,4	-1,2	0,5	-0,7	-1,3	-0,1	0,3
Western Europe	United Kingdom	-2,6	-9,2	-6,6	-4,5	-8,0	-3,5	-4,3	-5,8
Northern Europe	Denmark	5,0	-2,7	-7,7	-1,3	2,6	3,9	1,2	0,4
Northern Europe	Finland	5,1	-2,5	-7,6	-2,4	-2,6	-0,2	-2,1	-1,3
Northern Europe	Iceland	5,6	-6,7	-12,3	-0,4	-7,9	-7,5	-5,4	-2,6
Northern Europe	Norway	17,1	10,9	-6,2	6,0	9,1	3,1	20,3	10,0
Northern Europe	Sweden	3,3	-0,1	-3,4	0,0	-0,3	-0,3	0,1	0,0
Southern Europe	Cyprus	3,2	-4,7	-7,9	0,2	-1,7	-1,8	-0,5	-1,9
Southern Europe	Greece	-6,8	-11,3	-4,5	-3,0	-8,0	-4,9	-4,4	-5,8
Southern Europe	Italy	-1,3	-4,2	-2,9	-2,6	-7,2	-4,6	-5,4	-3,7
Southern Europe	Malta	-2,1	-2,3	-0,2	-1,0	-7,9	-6,9	-5,6	-2,4
Southern Europe	Portugal	-2,9	-11,4	-8,5	-4,4	-2,8	1,6	-1,9	-4,6
Southern Europe	Spain	1,9	-9,5	-11,4	-5,3	-6,9	-1,6	-4,9	-6,2
Central and Eastern Europe	Bulgaria	3,1	-3,8	-6,9	-2,8	-2,9	-0,2	-3,3	-1,1
Central and Eastern Europe	Croatia	-2,2	-6,4	-4,2	-3,4	-2,9	0,5	-2,8	-3,6
Central and Eastern Europe	Czech Republic	-0,6	-4,2	-3,5	-0,6	-5,9	-5,2	-4,0	-2,2
Central and Eastern Europe	Estonia	2,7	0,2	-2,6	0,1	-2,3	-2,4	-2,9	-0,8
Central and Eastern Europe	Hungary	-5,1	-4,4	0,7	-2,0	-6,8	-4,8	-4,9	-3,8
Central and Eastern Europe	Latvia	0,6	-6,4	-7,0	-1,5	-5,6	-4,0	-6,0	-2,5
Central and Eastern Europe	Lithuania	-1,0	-6,9	-5,9	-0,2	-1,0	-0,8	-2,0	-2,8
Central and Eastern Europe	Poland	-1,9	-7,4	-5,5	-2,6	-1,9	0,7	-4,1	-3,6
Central and Eastern Europe	Romania	-3,0	-6,4	-3,4	-1,5	-6,9	-5,4	-6,4	-4,4
Central and Eastern Europe	Slovak Republic	-2,1	-7,5	-5,5	-2,7	-6,2	-3,5	-4,0	-3,7
Central and Eastern Europe	Slovenia	0,0	-5,6	-5,6	-2,8	-5,2	-2,3	-3,1	-4,0
Oceania	Australia	1,5	-5,1	-6,6	-2,8	-6,5	-3,7	-3,4	-3,4
Northern America	Canada	1,8	-4,7	-6,6	-0,1	-5,0	-5,0	-2,2	-2,0
Oceania	New Zealand	3,6	-5,5	-9,1	0,3	-4,8	-5,1	-4,7	-1,5
Northern America	United States	-2,9	-11,0	-8,1	-3,5	-10,9	-7,4	-4,0	-7,0
	Average	-0,7	-4,3	-3,6	-1,7	-5,7	-4,0	-3,7	-3,4

Source: IMF WEO and author's calculation
Legend: Colouring: green highest, red lowest values

These expansionary fiscal measures were supported by a drastic reduction of interest rates, which declined from, on average, 5.5% in 2007 to 2.3% in 2010 (see Table 2, last row). The improvement of the fiscal situation after the crisis was made easier by the continuous low level of interest rates, which reduced the debt service burden of governments. Central policy rates remained, on average, well below 1% between 2015 and 2021. Only the return of inflation in 2022 led to a more contractionary monetary policy with interest rates that increased, on average, to values higher than 4% at the beginning of 2023.

Table 2: Central bank policy rates (in%)

Region	Country	31.07 2007	31.07 2010	31.07 2015	31.07 2022	31.01 2023	2007-10
Oceania	Australia	6,25	4,5	2	1,35	3,1	1,75
Northern America	Canada	4,5	0,75	0,5	2,5	4,5	3,75
Western Europe	Switzerland	2,5	0,375	-0,75	-0,25	1	2,125
Central and Eastern Europe	Czech Republic	3	0,75	0,05	7	7	2,25
Northern Europe	Denmark	4,25	0,5	-0,75	-0,1	1,75	3,75
Western Europe	United Kingdom	5,75	0,5	0,5	1,25	3,5	5,25
Central and Eastern Europe	Croatia	3,28	1,37	0,46	0		1,91
Central and Eastern Europe	Hungary	7,75	5,25	1,35	10,75	13	2,5
Northern Europe	Iceland	13,3	7,125	5	4,75	6	6,175
Northern Europe	Norway	4,5	2	1	1,25	2,75	2,5
Oceania	New Zealand	8,25	3	3	2,5	4,25	5,25
Central and Eastern Europe	Poland	4,5	3,5	1,5	6,5	6,75	1
Central and Eastern Europe	Romania	7	6,25	1,75	4,75	7	0,75
Northern Europe	Sweden	3,5	0,5	-0,35	0,75	2,5	3
Northern America	United States	5,25	0,125	0,125	2,375	4,375	5,125
	Euro area	4	1	0,05	0,5	2,5	3
	Average	5,474	2,343	0,965	2,867	4,665	3,130

Source: BIS and author's calculation
Legend: Colouring: green lowest, red highest values

These macro-economic policies influenced the development of employment and production (GDP), which will be analysed in the next subsection. They affect the distribution of income and wealth, too. Lower interest rates tend to increase wealth as asset prices rise because of higher demand due to cheaper credits and higher net present values of assets due to lower discounting rates. For instance, the (net present) value of assets with a constant stream of revenue will rise when future income is discounted at a lower interest rate. At the same time, lower interest rates reduce the income of those who hold financial assets (savings). As the possession of these assets are highly concentrated (see Table 13), such lower earnings from monetary wealth might reduce income inequality, to some extent. Conversely, rising interest rates will lower asset values. Thus, in 2023, many banks suffered from deteriorating balance sheets and global wealth declined by 4% (Czerepak, 2023, p. 2).

Governments influence the distribution of income and wealth directly through transfer payments (social spending), which is dealt with in the next section, and through tax policies and labour market regulation. Taxes affect disposable income through their structure and rates. Taxes on goods and services (value added or sales taxes) are regressive as they hit poorer households more than richer ones. Taxes on income and wealth are usually progressive with the exception of some countries that have flat rates (e.g. Hungary). The share of these two most important taxes varies between countries as tables 3 and 4 show. Low rates might be due to the fact that other sources of public revenue are more important, in particular social security contributions, Germany being a typical case. As Lindert (2021, p.178) states, surprisingly, the "offshoots from the British Empire" (Canada, US, Australia, New Zealand) with their relatively low-tax, low-social budget regimes depend much less on indirect taxes than the Scandinavian countries with their high-tax, high-social budget regimes.

The tables also show that the tax shares did not change much during the reported period (2007-2020). Standard deviation (last column Table 3 and 4) over the period remains below two percentage points for most countries.

Table 3: Taxes on goods and services (% of total tax revenue)

Region	Country	2007	2015	2020	Change 2007-2020	Average 2007-2020	Standard Deviation 2007-2020
Western Europe	Austria	26,8	26,3	26,3	↘	26,8	0,37
Western Europe	Belgium	25,4	24,8	26,4	↗	25,4	0,87
Western Europe	France	23,5	22,3	23,2	↘	22,6	0,53
Western Europe	Germany	24	23,2	18,9	↘	23	1,73
Western Europe	Ireland	37,8	31,2	27,7	↓	31,8	2,54
Western Europe	Luxembourg	32,5	26,7	26,5	↘	29	2,06
Western Europe	Netherlands	28,7	26,1	27,6	↘	26,7	0,95
Western Europe	Switzerland	32,8	30,2	28,8	↘	30,8	1,44
Western Europe	United Kingdom	32,3	35,6	33,1	↗	33,6	2,25
Northern Europe	Denmark	38,8	36	34,9	↘	36,2	1,42
Northern Europe	Finland	33,9	37,9	40,1	↗	37,5	1,90
Northern Europe	Iceland	38,7	34,5	37,7	↗	33,6	3,72
Northern Europe	Norway	24,2	25,9	28,1	↗	24,9	1,82
Northern Europe	Sweden	35,5	37,8	38,3	↗	37,9	0,89
Southern Europe	Cyprus	35,1	34,8	31,7	↘	34,6	1,25
Southern Europe	Greece	31,2	31,4	31,5	→	31,7	1,05
Southern Europe	Italy	22,7	23,9	22,6	→	23,3	1,05
Southern Europe	Malta	37,6	33,2	30,9	↘	34,6	1,93
Southern Europe	Portugal	32,7	31,6	31,2	↘	31,6	1,27
Southern Europe	Spain	,,	,,	25,8		27,5	1,23
Central and Eastern Europe	Bulgaria	43,9	44	43,6	↘	44,1	1,60
Central and Eastern Europe	Croatia	43,9	47,6	44,6	↗	46	1,64
Central and Eastern Europe	Czech Republic	27	30,3	26,9	→	29,1	1,54
Central and Eastern Europe	Estonia	37,2	37,1	35,2	↘	36,4	1,48
Central and Eastern Europe	Hungary	34,5	36,4	38,4	↗	36,3	1,79
Central and Eastern Europe	Latvia	42	43,4	43	↗	41,6	2,77
Central and Eastern Europe	Lithuania	33,7	34,2	38,6	↗	35,3	3,32
Central and Eastern Europe	Poland	37,3	35,3	35,7	↘	36,6	1,09
Central and Eastern Europe	Romania	34,6	38,3	32,4	↘	36	2,68
Central and Eastern Europe	Slovak Republic	32,6	27,5	31	↘	30,1	1,46
Central and Eastern Europe	Slovenia	48,2	51,8	49,8	↗	52	1,95
Oceania	Australia	23,2	21,3	19,3	↘	22,1	1,57
Northern America	Canada	15	13,8	13,7	↘	14,1	0,54
Oceania	New Zealand	25,9	29	29,5	↗	27,9	1,88
Northern America	United States	2,4	2,9	2,4	→	2,8	0,24
	Average	31,6	31,4	30,7	↘	31,2	1,60

*Source: World Development Indicators (WDI) and author's calculation; *US values are underestimating the true share because they probably exclude sales taxes that are levied by the states.*

Legend: Colouring: green highest, red lowest values for columns 1-3, 5;
column 6 (Standard deviation) red highest (most volatile), green lowest.
Arrows (column 4) indicate change between 2007 and 2020:
horizontal →: little change (<0.5);
declining ↘: change between -0.5 and -9.9;
rising ↗: change between 0.5 and 9.9;
vertical ↓: maximum change (>10).

Table 4: Taxes on income. profits and capital gains (% of total tax revenue)

Region	Country	2007	2015	2020	Change 2007-2020	Average 2007-2020	Standard Deviation 2007-2020
Western Europe	Austria	28,1	28,7	25,6	↘	27,2	1
Western Europe	Belgium	36,6	34,7	32,2	↘	34,6	1,6
Western Europe	France	25,2	25,5	28,6	↗	25,7	1,6
Western Europe	Germany	16,7	16,8	17,3	→	16,7	0,9
Western Europe	Ireland	38,7	39	45,1	↗	38,6	2,8
Western Europe	Luxembourg	27,9	30	32	↗	29,9	1,6
Western Europe	Netherlands	26,9	26,7	30,6	↗	26,7	2,5
Western Europe	Switzerland	19,8	22,6	22	↘	22,2	1,8
Western Europe	United Kingdom	39,7	34,2	35,4	↘	35,4	2
Northern Europe	Denmark	42	45,3	46	↗	43,7	2,4
Northern Europe	Finland	20,8	15,2	14,5	↘	15,9	1,9
Northern Europe	Iceland	27	28	33,1	↗	26,6	3,7
Northern Europe	Norway	31,1	22,2	18,3	↓	26,7	4,9
Northern Europe	Sweden	17,7	15,9	14,7	↘	14,8	1,5
Southern Europe	Cyprus	28,8	23,4	24,7	↘	25,3	1,7
Southern Europe	Greece	19	17,9	16,7	↘	18,3	1
Southern Europe	Italy	35,3	32,7	33,1	↘	33	1,2
Southern Europe	Malta	31,1	31,9	34,4	↗	32,5	1,5
Southern Europe	Portugal	22,4	25,3	23,6	↗	23,4	1,5
Southern Europe	Spain	,,	,,	18		19,5	1,1
Central and Eastern Europe	Bulgaria	17,2	15,6	16,9	→	15,8	0,9
Central and Eastern Europe	Croatia	9,8	6,8	7,1	↘	7,7	1,1
Central and Eastern Europe	Czech Republic	18,3	14,9	16,6	↘	15,8	1,1
Central and Eastern Europe	Estonia	21	20,9	20,7	→	19,7	1,4
Central and Eastern Europe	Hungary	20,5	15,2	16,6	↘	17,5	3,1
Central and Eastern Europe	Latvia	13,7	9,3	6,1	↘	9,2	2,8
Central and Eastern Europe	Lithuania	27,2	16,4	29,7	↗	19,8	6
Central and Eastern Europe	Poland	14,9	12,1	13,2	↘	13	1
Central and Eastern Europe	Romania	19	18,8	14,5	↘	18	1,9
Central and Eastern Europe	Slovak Republic	18,6	17	18,7	→	17,6	1,6
Central and Eastern Europe	Slovenia	23,2	14,1	18	↘	16,8	3,2
Oceania	Australia	65,7	64,9	64,5	↘	64,6	1,3
Northern America	Canada	54,8	54	55,8	→	54,2	0,9
Oceania	New Zealand	56,7	51,6	53,5	↘	52,5	3,5
Northern America	United States	56	54,2	51,4	↘	51,8	2,8
	Average	27,5	25,4	26	↘	25,6	0,9

Source: WDI and author's calculation
Legend: Colouring: green highest, red lowest values for columns 1-3, 5; column 6 (Standard deviation) red highest (most volatile), green lowest.
Arrows (column 4) indicate change between 2007 and 2020:
horizontal →: little change (<1);
declining ↘: change between -1 and -9.9;
rising ↗: change between 1 and 9.9;
vertical ↓: maximum change (>10).

Top income tax rates vary between 15% and over 50% (see table 5). These rates are applied to incomes above a certain threshold. The thresholds vary substantially, too. The highest, measured by a multiple of average wage[7], is applied in Austria (21.7), followed by France, Portugal and Spain (all above 10). The lowest thresholds (below 1) are in force in Hungary (0) and Estonia (0.3), but the rates are very low there, too (15% and 20%). Between 2007 and 2021, on average for all countries, top rates hardly changed while thresholds were doubled (already in 2014), thus lessening the burden to poorer households. Notable exceptions are Austria, which increased its top rate by 11.3 percentage points, Portugal by 11, Iceland by 10.5.

[7] The average wage is the average gross wage before tax. For a detailed description see: https://www.oecd-ilibrary.org/sites/8c99fa4d-en/1/4/1/index.html?itemId=/content/publication/8c99fa4d-en&_csp_=f4d3c57328afb7f1cbd530cb119213be&itemIGO=oecd&itemContentType=book

Table 5: Top statutory personal income tax rate and thresholds (in multiple of average wage and USD converted at PPP) for selected years

Region	Country	2007 Top rate	2007 Threshold *	2014 Top rate	2014 Threshold *	2021 Top rate	2021 Threshold *	2007-2021 rate change	2007-2021 threshold change
Western Europe	Austria	43,71	1,92	50	13,88	55	21,75	↑	↑
Western Europe	Belgium	53,7	1,04	53,75	1,59	52,88	1,02	→	→
Western Europe	France	45,78	2,81	54,5	15,05	55,37	14,71	↑	↑
Western Europe	Germany	47,48	6,34	47,48	5,66	47,48	5,45	→	→
Western Europe	Ireland	43,5	2,44	48	0,76	48	1,38	↗	↘
Western Europe	Luxembourg	38,95	0,9	43,6	2,98	45,78	3,21	↗	↗
Western Europe	Netherlands	52	1,28	52	1,24	49,5	1,32	↘	→
Western Europe	Switzerland	42,06	3,16	41,67	3,46	41,67	3,2	→	→
Western Europe	United Kingdom	40	1,2	45	4,27	45	3,41	↗	↗
Northern Europe	Denmark	59	1,03	55,56	1,23	55,9	1,29	↘	→
Northern Europe	Finland	50,45	1,83	51,49	2,53	51,27	1,88	→	→
Northern Europe	Iceland	35,72	0	46,24	1,37	46,25	1,21	↑	↗
Northern Europe	Norway	40	1,54	39	1,59	38,2	1,55	↘	→
Northern Europe	Sweden	56,55	1,45	56,86	1,51	52,27	1,11	↘	→
Southern Europe	Cyprus					35			
Southern Europe	Greece	40	3,73	46	5,27	44	2,47	↗	↘
Southern Europe	Italy	44,9	3,23	47,84	9,89	47,23	2,45	↗	→
Southern Europe	Malta					35			
Southern Europe	Portugal	42	4,43	56,5	16,22	53	13,63	↑	↑
Southern Europe	Spain	43	2,6	52	11,66	45,5	11,37	↗	↑
Central and Eastern Europe	Bulgaria					28			
Central and Eastern Europe	Croatia					40			
Central and Eastern Europe	Czech Republic	32	1,51	15	0	23	3,91	↓	↗
Central and Eastern Europe	Estonia	22	0,17	21	0,14	20	0,33	↘	→
Central and Eastern Europe	Hungary	36	0,79	16	0	15	0	↓	→
Central and Eastern Europe	Latvia	25	0,15	24	0,11	31	4,11	↗	↗
Central and Eastern Europe	Lithuania	27	0,18	15	0,24	32	4,34	↗	↗
Central and Eastern Europe	Poland	40	3,12	32	2,26	32	1,6	↘	↘
Central and Eastern Europe	Romania					45			
Central and Eastern Europe	Slovak Republic	19	0,44	25	3,77	25	3,12	↗	↗
Central and Eastern Europe	Slovenia	41	1,44	50	5,31	50	4,31	↑	↗
Oceania	Australia	46,5	2,63	46,5	2,27	47	1,93	→	→
Northern America	Canada	46,41	2,22	49,53	3,42	53,53	2,98	↗	→
Oceania	New Zealand	39	1,39	33	1,27	39	2,72	→	↗
Northern America	United States	41,4	8,44	46,25	8,22	43,65	8,52	↗	→
	Average	41,14	2,11	42,03	4,24	41,96	4,34		

*Note: * thresholds as multiple of average wage. Legend: Colouring: green highest, red lowest values.*
Changes: ↑: >9; ↗:< 9 and > 1; →: <1 and >-1; ↘: <-1 and >-9; ↓: <-9.
Source: OECD; for non-OECD countries (Bulgaria: Work and retirement within the Union (egov.bg); Bulgaria - Individual - Taxes on personal income (pwc.com), Croatia: Income tax (porezna-uprava.hr), Cyprus: Cyprus - Individual - Taxes on personal income (pwc.com), Malta: Tax Rates - 2017 (gov.mt); Romania: Tax | ARICE - Invest Romania (gov.ro) (without year in column 2021; no data for threshold).

Another possible way for governments to influence employment and income is labour market policy. For many years after 1980, the received wisdom ("supply side economics") suggested that less regulation would increase employment and income. Full employment should be achieved by giving the market as much leeway as possible. Minimum wages and employment protection legislation would prevent possible employers from hiring workers. With rising concerns about inequality after the financial crisis in 2009 (see above in section "concepts") attitudes changed. In Germany, which introduced minimum wages relatively late in 2015, market-oriented economists and

employers had warned that many thousands of jobs would be lost. In the end, employment increased, albeit probably due to other factors. Many countries with strong unions, such as Scandinavian countries, do not have minimum wages, relying instead on wage floors negotiated between unions and employers.

The average levels of minimum wages, measured in percent of the median wage, vary from over 60% in Bulgaria and New Zealand to 34.6% in the USA, with the average of all countries over the whole period being 48.9% (see Table 6). Changes reflect changes in the minimum wage as well as changes in median wage

Table 6: Minimum wages (as percentage of median wage)

Region	Country	2007	2010	2015	2021	Average 2007-2021	Change 2007-2021
Western Europe	Austria						
Western Europe	Belgium	47,9	48,2	45,3	44,7	46,4	↘
Western Europe	France	63,3	62,1	62,3	60,9	62,1	↘
Western Europe	Germany	..	..	48,1	51,1	48,9	↗
Western Europe	Ireland	42,7	45,3	39,2	46,1	43,9	↗
Western Europe	Luxembourg	54,1	55,4	54,4	54,8	54,6	→
Western Europe	Netherlands	48,7	47,3	46,6	46,3	47,3	↘
Western Europe	Switzerland						
Western Europe	United Kingdom	46,6	46,1	48,6	56,9	50,2	↑
Northern Europe	Denmark						
Northern Europe	Finland						
Northern Europe	Iceland						
Northern Europe	Norway						
Northern Europe	Sweden						
Southern Europe	Cyprus						
Southern Europe	Greece	44,4	46,5	42,3	49,8	45,5	↗
Southern Europe	Italy						↗
Southern Europe	Malta		56,0	56,5	67,3	56,7	→
Southern Europe	Portugal	47,6	52,7	56,3	66,2	56,2	↑
Southern Europe	Spain	39,2	37,7	37	48,4	40,7	↗
Central and Eastern Europe	Bulgaria		54,4	:		61,0	↑
Central and Eastern Europe	Croatia	..	45,4	..	..	45,5	→
Central and Eastern Europe	Czech Republic	40,7	37,6	38,7	43,2	39,6	↗
Central and Eastern Europe	Estonia	35,7	40,4	41,3	42,6	40,6	↗
Central and Eastern Europe	Hungary	46,7	47,4	52,5	45,2	49,7	↘
Central and Eastern Europe	Latvia	36,6	48,9	51,8	42,3	46,1	↗
Central and Eastern Europe	Lithuania	39,3	49,8	51,8	46,7	48,7	↗
Central and Eastern Europe	Poland	39,6	45,3	51,2	55	49,2	↑
Central and Eastern Europe	Romania	38	42,6	54,9	54,8	50,1	↑
Central and Eastern Europe	Slovak Republic	44,3	45,6	47,3	52,4	47,0	↗
Central and Eastern Europe	Slovenia	49,5	58,9	59,7	60,4	57,8	↑
Oceania	Australia	54,4	54,2	53,2	51,5	53,4	↘
Northern America	Canada	40,7	43,9	44,5	49,5	45,6	↗
Oceania	New Zealand	57,3	58,8	60	67,6	60,7	↑
Northern America	United States	31,4	38,8	35,8	29	34,6	↘
	Average	44,9	48,4	49,1	51,4	48,9	↗

Note: there are no statutory minimum wages in Scandinavian countries.
Legend: Colouring: green highest, red lowest values.
Changes: >10; ↗ :< 9 and > 1; →: <1 and >-1; ↘ : <-1 and >-10.
Source: OECD and Eurostat and author's calculation.

Minimum wages, as a percentage of the median wage (see Table 6) increased in many countries, on average for all countries by 6.5 percentage points. The highest rises (from 2007-2021) were found in Malta (+67.3), Portugal (+18.6), Romania (+16.8), Poland (+15.4), Bulgaria (+11.5), Slovenia (+10.9), UK and New Zealand (both +10.3). Only in six countries, the minimum wage (relative to the median wage) declined: Australia (-2.9), Belgium (-3.2), France (-2.4), the United States (-2.4), the Netherlands (-2.4), and Hungary (-1.5). A rise or decline of the minimum wage as a percentage of the median wage does not necessarily imply an absolute rise or decline of the minimum wage. It may totally or partially be caused by respective inverse changes of the median wage. Thus, it is very likely that the decline in the above mentioned six countries reflects a rise in the median wage that is not accompanied by an equal rise of the minimum wage.

The OECD evaluates labour market policies by calculating an Index of employment protection legislation (EPL). The index is based on the observation of 21 items in the area of laws regulating the dismissal of workers with regular contracts (e.g. notice periods and severance pay), additional costs for collective dismissals and the regulation of temporary employment.[8] It is often assumed that high levels of EPL harm employment as they prevent potential employers from hiring people who are difficult and costly to dismiss. Strong protection of workers with permanent contracts might lead to a higher share of temporary contracts (as employers try to avoid or reduce inflexibility) and thus to an insider-outsider problem within the workforce. Table 7 shows the values of that index.

[8] See for a more detailed description: https://www.oecd.org/employment/emp/oecdindicatorsofemploymentprotection-methodology.htm

Table 7: Strictness of employment protection legislation

Region	Country	2007	2013	2019	Average 2007-2019	Change 2007-2019
Western Europe	Austria	2,56	2,56	2,56	2,56	→
Western Europe	Belgium	2,6	2,6	2,87	2,73	↑
Western Europe	France	2,83	2,68	2,72	2,7	↘
Western Europe	Germany	2,89	2,89	2,89	2,89	→
Western Europe	Ireland	1,79	1,88	1,88	1,84	↗
Western Europe	Luxembourg	..	2,63	2,63	2,63	→
Western Europe	Netherlands	3,22	3,22	3,49	3,26	
Western Europe	Switzerland	2,06	2,06	2,06	2,06	→
Western Europe	United Kingdom	1,76	1,64	1,57	1,66	↘
Northern Europe	Denmark	1,87	1,92	1,92	1,9	→
Northern Europe	Finland	2,02	1,95	1,89	1,94	↘
Northern Europe	Iceland	..	1,94	1,94	1,94	→
Northern Europe	Norway	2,38	2,38	2,38	2,38	→
Northern Europe	Sweden	2,6	2,6	2,6	2,6	→
Southern Europe	Cyprus					
Southern Europe	Greece	3,06	2,57	2,57	2,73	↓
Southern Europe	Italy	3,33	3,17	2,68	3,1	↓
Southern Europe	Malta					
Southern Europe	Portugal	3,98	2,96	2,78	3,16	↓
Southern Europe	Spain	2,65	2,26	2,32	2,43	↘
Central and Eastern Europe	Bulgaria					
Central and Eastern Europe	Croatia	..	..	..	2,42	→
Central and Eastern Europe	Czech Republic	3,02	2,93	2,93	2,97	→
Central and Eastern Europe	Estonia	..	2,11	2,11	2,17	↓
Central and Eastern Europe	Hungary	2,4	2,17	2,17	2,27	↘
Central and Eastern Europe	Latvia	..	3,23	3,23	3,23	→
Central and Eastern Europe	Lithuania	..	..	2,34	2,58	↘
Central and Eastern Europe	Poland	2,48	2,48	2,48	2,48	→
Central and Eastern Europe	Romania					
Central and Eastern Europe	Slovak Republic	3,13	2,76	2,76	2,89	↘
Central and Eastern Europe	Slovenia	..	2,9	2,52	2,72	↘
Oceania	Australia	1,65	2,01	2,01	1,93	↑
Northern America	Canada	1,31	1,31	1,31	1,31	→
Oceania	New Zealand	1,29	1,17	1,17	1,22	↘
Northern America	United States	0,67	0,67	0,67	0,67	→
	Average	2,4	2,33	2,32	2,36	↘

Legend: Colouring: green highest, red lowest values
Changes: ↑: >0.25; ↗: < 0.25 and > 0; →: 0; ↘: <0 and >-0.25.
Source. OECD and author's calculation

As Table 7 shows, EPL scores vary among countries, albeit for different reasons. The lowest scores are to be found in liberal, mostly Anglo-Saxon economies and, perhaps surprisingly, in some Scandinavian countries. There, a high degree of social security for the unemployed accompanies and permits low levels of EPL (the well-known "flexicurity"). Changes vary, too. Employment protection legislation became slightly less strict between 2007 and 2019, albeit not by much (-0.08 on the average for all countries). In Portugal, protection decreased most (-1.2), followed by Italy (-0.65) and Greece (-0.49), probably as a consequence of pressure by the creditors (Troika).

4.3.2. Output: Economic growth and its distribution

How did the economies of the 35 countries develop since 2007? With regard to economic growth, there were two deep recessions, one in 2009 caused by the financial market crisis, and one in 2020 due to the pandemic and the lockdowns (visible in the orange/red colouring in Table 8). GDP per capita[9] fell, measured by the unweighted average of all 35 countries, by 5.2% in 2009 and 4.7% in 2020. There are substantial differences between countries, but in 2009 only Poland avoided a recession, in 2020 the exceptions were Ireland and, perhaps, with zero growth, Lithuania. Over the whole period, the worst performing countries were Greece and Spain, both hit by the so-called "Euro crisis" and the pandemic that led to a massive decline in tourism. The "Euro crisis" actually was a sovereign debt panic in the ill-designed Euro zone, a currency union without a lender of last resort and a common deposit insurance system, thus prone to dangerous doom loops between weakened banks and sovereign debt. Austerity policies, forced upon several countries in 2010, prolonged the recession. The European Central Bank (ECB) even increased interest rates again in 2011, while most other central banks (the American Fed, UK or Switzerland) kept their rates low. In the end, the belated declaration by the president of the ECB, Draghi, in 2012 stopped the panic. But between 2009 and 2013, Greece, Spain, Italy, Cyprus, and Portugal suffered from years of declining GDP per capita. The best performers were Ireland and the countries of Central and Eastern Europe (CEE).

[9] We use GDP/cap rather than GDP to control for changing population.

Table 8: Annual GDP per capita growth (in%)

Region	Country	2007	2009	2015	2020	2021	Average 2007-2021
Western Europe	Austria	3,4	-4,0	-0,1	-6,8	4,1	0,5
Western Europe	Belgium	2,9	-2,8	1,5	-5,8	5,6	0,6
Western Europe	France	1,8	-3,4	0,8	-8,0	6,5	0,4
Western Europe	Germany	3,1	-5,5	0,6	-3,8	2,6	1,1
Western Europe	Ireland	2,3	-6,1	23,2	5,1	12,5	4
Western Europe	Luxembourg	6,4	-5,0	-0,1	-2,4	3,5	0,2
Western Europe	Netherlands	3,5	-4,2	1,5	-4,4	4,3	0,7
Western Europe	Switzerland	3,0	-3,5	0,5	-3,1	3,4	0,7
Western Europe	United Kingdom	1,8	-5,2	1,6	-11,4	7,1	0,3
Northern Europe	Denmark	0,5	-5,4	1,6	-2,3	4,4	0,6
Northern Europe	Finland	4,9	-8,5	0,2	-2,3	2,8	0,4
Northern Europe	Iceland	5,7	-8,0	3,4	-8,3	2,7	0,5
Northern Europe	Norway	1,9	-3,0	1,0	-1,3	3,3	0,3
Northern Europe	Sweden	2,7	-5,2	3,4	-2,9	4,4	0,9
Southern Europe	Cyprus	2,9	-4,6	4,0	-5,5	5,6	0,6
Southern Europe	Greece	3,0	-4,6	0,5	-8,8	9,0	-1,3
Southern Europe	Italy	1,0	-5,7	0,9	-8,6	7,3	-0,4
Southern Europe	Malta	4,4	-1,9	7,0	-10,3	9,6	2,9
Southern Europe	Portugal	2,3	-3,2	2,2	-8,4	5,2	0,5
Southern Europe	Spain	1,7	-4,6	3,9	-11,8	5,4	-0,1
Central and Eastern Europe	Bulgaria	7,4	-2,7	4,1	-3,4	8,5	2,9
Central and Eastern Europe	Croatia	5,0	-7,1	3,4	-8,2	17,4	1,8
Central and Eastern Europe	Czech Republic	5,0	-5,2	5,2	-5,7	5,4	1,6
Central and Eastern Europe	Estonia	8,1	-14,5	1,8	-0,7	7,9	2,1
Central and Eastern Europe	Hungary	0,4	-6,5	4,0	-4,3	7,6	1,9
Central and Eastern Europe	Latvia	10,8	-12,8	4,7	-1,5	4,9	2,4
Central and Eastern Europe	Lithuania	12,4	-13,9	3,0	0,0	5,8	3,8
Central and Eastern Europe	Poland	7,1	2,8	4,5	-1,8	7,3	3,8
Central and Eastern Europe	Romania	8,8	-4,7	3,6	-3,1	5,9	3,6
Central and Eastern Europe	Slovak Republic	10,8	-5,6	5,1	-3,5	3,2	2,7
Central and Eastern Europe	Slovenia	6,4	-8,4	2,1	-5,0	7,9	1,4
Oceania	Australia	1,9	-0,2	0,7	-1,3	2,1	0,9
Northern America	Canada	1,1	-4,0	-0,1	-6,3	4,0	0,4
Oceania	New Zealand	2,1	-1,1	1,7	-3,4	3,1	0,9
Northern America	United States	1,0	-3,5	2,0	-3,7	5,8	1
	Average	4,2	-5,2	2,9	-4,7	5,9	1,3

Legend: Colouring: green highest, red lowest values. Source: World Development Indicators and author's calculation.

Seen from the supply side, GDP growth can be accounted for by the growth of hours worked (Table 9) and hourly productivity (GDP/h; Table 10). The following equation shows the major components:

GDP/cap = GDP/h x hours worked/employed person x employment/workforce x workforce/active population x active population/total population.

With the factor employment/workforce equal to 1 - unemployment rate, and the active population being the age group 15-65.

The last four factors together give the total number of hours worked in an economy as a result of the number of hours worked per employee, the unemployment rate, the labour market participation and the demographic structure.

One could also consider productivity growth as the core (and main cause) of GDP growth, which can be translated into higher output (GDP) or less working hours. Historically, productivity increased much faster than in recent decades and has been partially used to reduce working time, at least in most richer countries. In the period under consideration here (2008-2021) the growth of the total number of hours worked reflected to some extent GDP growth, to some extent demographic change or changing labour market participation. Seen as demand, GDP growth (when stronger than productivity growth) leads to higher labour input (more employment).

In 2009 and 2020, the drop of hours worked in many countries was caused by the respective crises. In Greece and Spain, the longer lasting decline resulted from the "Euro crisis" (as mentioned above). In some other countries, in particular in the Baltics and Eastern Europe, the decline was probably driven by emigration. The low values of the countries' average over the whole period (last column in Table 9) reflects the recent crisis caused by the pandemic. In 2019, the total number of hours worked for all countries was 5% higher than in 2007. This gain disappeared during the crisis. Seen from the supply side, more hours worked produce a higher output (GDP). The latter view informs policies that want to promote growth by increasing labour input through, for instance, higher labour market participation of women or later retirement.

Actually, since 2008, many countries increased the statutory retirement age, primarily to stabilise the pension system (limiting contributions and the ratio of pensioners per employed people). Arguably, a welcome side effect might have been a rise of the labour supply in so far as old people retired later. However, the effective retirement age has always been lower than the statutory retirement age, usually by several years (European Commission, 2009, table 9, p. 76; European Commission, 2021, p. 57; OECD, 2021, figure 6.14, p.179). In most countries, the statutory retirement age depends on various conditions such as the number of years people have contributed, the respective pension system or, in the case of women, the number of children. When certain conditions are met, earlier retirement is possible, albeit sometimes with lower pensions. Early retirement schemes have also been used to lower unemployment by smoothing job losses due to structural or cyclical crises.

In 2019, normal (i.e. not early) statutory retirement ages ranged from 63.5 (Baltic countries) to 67 (Greece, Italy, Norway, Sweden) with an average value of 64.5 (OECD, 2021, table II.1.3, p.76). Often, especially in Central and Eastern Europe, the statutory retirement age for women has been lower than for men.

Table 9: Growth of hours worked in the total economy (in percent)

Region	Country	2009	2017	2020	2021	Average 2008-2021
Western Europe	Austria	-2,9	0,3	-8,4	3,2	-0,1
Western Europe	Belgium	-1,8	1,4	-9,1	4,6	0,3
Western Europe	France	-1,7	-0,1	-7,8	8,8	0,4
Western Europe	Germany	-3,1	0,5	-5,4	1,0	0,1
Western Europe	Ireland	-9,9	3,6	-2,6	5,9	0,3
Western Europe	Luxembourg	3,0	3,7	-4,7	2,1	2,0
Western Europe	Netherlands	-0,5	2,1	-2,2	4,1	0,9
Western Europe	Switzerland	0,4	-0,4	-3,5	2,1	0,3
Western Europe	United Kingdom	-2,2	0,6	-12,0	9,5	0,6
Northern Europe	Denmark	-4,0	0,5	-3,0	3,3	-0,1
Northern Europe	Finland	-4,2	0,6	-2,1	1,1	-0,2
Northern Europe	Iceland	-11,2	0,9	-5,5	0,4	0,1
Northern Europe	Norway	-2,0	-0,5	-1,1	4,7	1,0
Northern Europe	Sweden	-2,9	1,5	-3,2	2,4	0,8
Southern Europe	Cyprus	-1,1	4,3	-6,3	4,8	0,8
Southern Europe	Greece	-2,4	2,4	-10,5	9,6	-1,4
Southern Europe	Italy	-3,4	1,0	-10,9	5,8	-0,7
Southern Europe	Malta	0,3	4,3	-5,0	3,0	3,0
Southern Europe	Portugal	-2,9	2,7	-9,5	2,3	-0,8
Southern Europe	Spain	-6,3	2,1	-9,5	7,7	-0,4
Central and Eastern Europe	Bulgaria					
Central and Eastern Europe	Croatia	-0,8	1,8	-1,4		-0,5
Central and Eastern Europe	Czech Republic	-2,0	1,8	-5,8	2,5	0,3
Central and Eastern Europe	Estonia	-15,7	2,2	-5,5	7,5	-0,4
Central and Eastern Europe	Hungary	-4,4	0,9	-4,9	6,6	0,9
Central and Eastern Europe	Latvia	-16,0	-0,7	-5,1	-1,1	-2,1
Central and Eastern Europe	Lithuania	-11,1	-2,7	-5,6	2,4	-0,6
Central and Eastern Europe	Poland	-0,3	0,3	-0,9	4,8	0,6
Central and Eastern Europe	Romania	-4,7	1,1	-4,6		-1,2
Central and Eastern Europe	Slovak Republic	-3,5	0,0	-9,0	1,9	-0,2
Central and Eastern Europe	Slovenia	-1,2	2,9	-4,7	3,4	-0,3
Oceania	Australia	-1,1	2,3	-3,8	3,7	1,2
Northern America	Canada	-3,3	1,4	-7,8	7,4	0,7
Oceania	New Zealand	-2,5	4,3	-1,2	1,7	1,7
Northern America	United States	-5,1	1,2	-6,7	4,6	0,3
	Average	-3,8	1,4	-5,6	4,1	0,2

Legend: Colouring: green highest, red lowest values.
Source: Eurostat + OECD and author's calculation.

The second driver of growth is labour productivity. Generally, as can be seen in Table 10, the two crises (2009 and 2020) caused a drop in productivity in many countries as production and value added declined faster than labour input.[10] Here, it is interesting to see that some countries (e.g. the Baltics and Romania), where the number of hours worked had declined over the whole period, showed an above average productivity growth.

10 The same process increases the wage share during sharp recessions as profits collapse and wages continue to be paid until later when employers start firing workers they can no longer afford.

Table 10: Growth of productivity (GDP/h) in percent

Region	Country	2008	2015	2021	Average 2008-2021
Western Europe	Austria	2,07%	3,48%	3,28%	2,65%
Western Europe	Belgium	1,60%	3,67%	4,45%	2,33%
Western Europe	France	0,89%	1,91%	-0,49%	1,62%
Western Europe	Germany	0,89%	2,46%	4,70%	2,39%
Western Europe	Ireland	-2,90%	29,30%	7,99%	5,56%
Western Europe	Luxembourg	12,87%	-3,05%	10,52%	2,50%
Western Europe	Netherlands	2,18%	1,71%	3,31%	1,37%
Western Europe	Switzerland	0,74%	4,26%	6,01%	3,12%
Western Europe	United Kingdom	3,39%	2,50%	-1,40%	2,60%
Northern Europe	Denmark	4,85%	5,16%	3,60%	3,46%
Northern Europe	Finland	2,49%	2,81%	4,46%	2,15%
Northern Europe	Iceland	12,21%	7,27%	10,24%	6,01%
Northern Europe	Norway	7,07%	-1,66%	15,95%	2,31%
Northern Europe	Sweden	2,44%	-1,09%	2,87%	0,63%
Southern Europe	Cyprus	4,54%	0,56%	4,65%	1,39%
Southern Europe	Greece	3,18%	-1,82%	0,17%	-0,24%
Southern Europe	Italy	1,18%	0,81%	1,47%	1,43%
Southern Europe	Malta	3,87%	10,70%	9,01%	3,51%
Southern Europe	Portugal	2,27%	2,30%	4,53%	2,14%
Southern Europe	Spain	3,18%	1,14%	0,28%	1,47%
Central and Eastern Europe	Bulgaria				
Central and Eastern Europe	Croatia	5,38%	4,88%		1,84%
Central and Eastern Europe	Czech Republic	1,10%	2,70%	5,16%	2,12%
Central and Eastern Europe	Estonia	3,14%	0,78%	6,46%	5,30%
Central and Eastern Europe	Hungary	7,13%	3,97%	6,84%	4,56%
Central and Eastern Europe	Latvia	10,92%	4,66%	12,50%	4,71%
Central and Eastern Europe	Lithuania	6,45%	1,86%	9,04%	5,27%
Central and Eastern Europe	Poland	4,83%	3,91%	7,08%	5,15%
Central and Eastern Europe	Romania	28,89%	8,30%		8,84%
Central and Eastern Europe	Slovak Republic	5,08%	2,65%	3,52%	3,58%
Central and Eastern Europe	Slovenia	5,75%	2,81%	7,39%	2,98%
Oceania	Australia	5,59%	-0,19%	1,30%	3,73%
Northern America	Canada	3,72%	-0,99%	5,17%	2,52%
Oceania	New Zealand	1,89%	2,84%	6,42%	2,72%
Northern America	United States	3,05%	1,91%	5,80%	2,96%
	Average	4,76%	3,31%	5,38%	3,08%

Legend: Colouring: green highest, red lowest values.
Source: OECD + Eurostat and author's calculation.

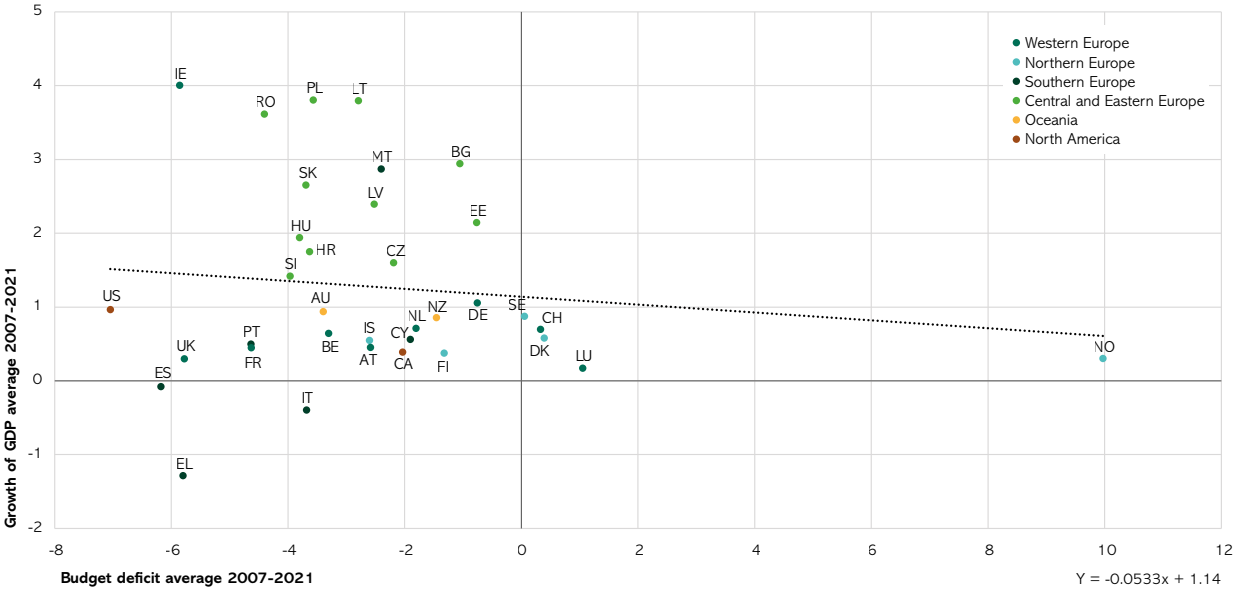
How did the inputs (= government policies) affect the output? It is difficult to establish a causal relationship regarding the effectiveness of deficit spending. Budget deficits are correlated with recessions, although they do not cause them. They result to a large extent from automatic stabilisers, i.e. lower tax revenue due to the recession and higher spending on compensatory policies such as unemployment benefits. If governments tried to keep budgets balanced in times of recession, they are likely to deepen it. Thus, it is hardly surprising that no strong correlation between budget deficits and GDP growth can be observed (see figure 1 which correlates total deficits and total growth over the period 2007-2020). The equation for the trend line in figure 1 is GDP = -0.0533Deficit + 1.14 indicating that, on average, one additional percentage point of deficit spending increases growth but by 0.05 percentage points. An in-depth analysis of the effectiveness of fiscal (and monetary) policy would require a country-by-country investigation using complex macro-economic, econometric models, which is beyond the scope of this study.[11]

[11] For one possible analytical approach see Bankowski et al., 2021.

The assessment is further complicated by many country-specific circumstances. Looking at Figure 1 the, to some extent, atypical countries are those lying in the bottom-left quadrant combining deficits and recession and those in the top-right quadrant combining surpluses and growth. The first group encompasses the Mediterranean countries (victims of counterproductive austerity policies), the second group encompasses some of the richest countries such as Norway with its huge oil and gas revenues (plus Luxembourg, Switzerland and Denmark). The countries with the highest growth rates (besides Ireland, see below) are the new EU member states of Central Eastern Europe (CEE). Their economies were catching up with the richer core of the EU by adopting modern production methods and benefitting from inflows of EU funds and foreign direct investment (FDI).

Another example for special circumstances is Ireland. Ireland has based its growth on FDI, in particular by tax-avoiding multinationals. In our time period (2007-2022), Ireland had the highest growth rate in our sample (see Table 8 and Figure 1), but relatively high budget deficits, too (see Figure 1). While the extremely high budget deficits occurred in 2009-2011 (see Table 1) as the state bailed out the banks, the growth occurred, above all, in 2015 (see Table 8) with a rate of 23% (!). Significantly, the number of hours worked increased in 2015 by only 4.25%. With high (artificial) growth of GDP and low growth of hours worked, productivity (GDP/h; see Table 10) showed spectacular growth, too. Actually, the astonishing rise of GDP in that year was largely due to an artificial influx of FDI amounting to 140 bn Euros (about half the total GDP), which was the result of changes in the rules of accounting for intangible assets.[12] Arguably, this is due to government policies, namely a low corporate tax level and other incentives to attract FDI. , However, it is hardly linked to traditional macro-economic policies of demand management.

Figure 1: Budget deficits and economic growth



Source: author's calculation

On average, the distribution of income did not dramatically change during the period under consideration (2007-2019). The income considered here is disposable income that results after accounting for taxes paid and social benefits received.[13] In many countries, inequality declined somewhat in the wake of the financial crisis but increased later again. To some extent, these positive developments might reflect the impact of low interest rates on the income of households with large monetary savings, as explained above. Over the whole period, a notable decline of income inequality occurred in some countries such as Poland, Portugal, Latvia, and the Netherlands. The strongest rises of inequality could be observed in Bulgaria, Croatia, Luxembourg, and Sweden (see table 11).

[12] Paul Krugmann called this "Leprechaun economics".
[13] Table 26 below presents the Gini index of the distribution of market income, i.e. before taxes and benefits.

Table 11: Gini Index

Region	Country	2007	2013	2019	Change 2007-2019	Average 2007-2019	Change 2007-2019
Western Europe	Austria	30,6	30,8	30,2	0,2	30,6	→
Western Europe	Belgium	29,2	27,7	27,2	-2	27,9	↘
Western Europe	France	32,4	32,5	32,4	0	32,6	→
Western Europe	Germany	31,4	31,5	31,7	0,3	31,1	→
Western Europe	Ireland	31,9	33,5	30,6	-1,3	32,2	↘
Western Europe	Luxembourg	31,1	32	34,2	4,3	32,6	↑
Western Europe	Netherlands	29,6	28,1	29,2	-1,5	28,4	↘
Western Europe	Switzerland	34,3	32,5	33,1	-1,2	32,8	↘
Western Europe	United Kingdom	35,7	33,2	35,1	0,6	34,0	→
Northern Europe	Denmark	26,2	28,5	27,7	2	27,6	↗
Northern Europe	Finland	28,3	27,2	27,7	-1	27,4	↘
Northern Europe	Iceland	29,5	25,4	26,1	-3,4	27,6	↓
Northern Europe	Norway	27,1	26,4	27,7	0,5	26,8	→
Northern Europe	Sweden	27,1	28,8	29,3	2,9	28,4	↗
Southern Europe	Cyprus	31,1	37	31,2	1,6	32,9	↗
Southern Europe	Greece	34	36,1	33,1	-1,1	34,6	↘
Southern Europe	Italy	32,9	34,9	35,2	2,3	34,7	↗
Southern Europe	Malta	29,2	28,8	31	-0,5	29,3	→
Southern Europe	Portugal	36,8	36,2	32,8	-3,3	35,3	↓
Southern Europe	Spain	34,1	36,2	34,3	0,6	35,2	→
Central and Eastern Europe	Bulgaria	36,1	36,6	40,3	5,2	37,3	↑
Central and Eastern Europe	Croatia	32,6	32	28,9	5,1	31,4	↑
Central and Eastern Europe	Czech Republic	26	26,5	25,3	-1	25,9	↓
Central and Eastern Europe	Estonia	31,2	35,1	30,8	-0,9	32,1	→
Central and Eastern Europe	Hungary	27,9	31,5	30	1,7	29,6	↗
Central and Eastern Europe	Latvia	37,5	35,5	34,5	-2,4	35,5	↘
Central and Eastern Europe	Lithuania	34,8	35,3	35,3	0,9	35,8	→
Central and Eastern Europe	Poland	34	33,1	30,2	-3,8	32,4	↓
Central and Eastern Europe	Romania	37,5	36,9	34,8	-1,7	35,9	↘
Central and Eastern Europe	Slovak Republic	24,7	28,1	23,2	0,3	25,8	→
Central and Eastern Europe	Slovenia	24,4	26,2	24,4	0,2	24,9	→
Oceania	Australia	35,4	34,4	34,3	1	34,5	↗
Northern America	Canada	33,8	33,8	33,3	-0,3	33,5	→
Oceania	New Zealand	..	..	..			
Northern America	United States	40,8	40,7	41,5	0,6	41,0	→
	Average	31,6	32,1	31,0	0,0	31,6	→

*Note: * the given value does not refer to the year of the column heading but to the year closest to it with available data.*
Legend: Colouring: green lowest, red highest values.
Changes: ↑: >3; ↗: < 3 and > 1; →: >-1and <1; ↘: <-3 and >-1; ↓: >-3.
Source: World Development Indicators and author's calculation.

Income distribution can be considered between households or individuals (usually measured by the Gini or other indicators) or between capital and labour or profits and wages, usually called functional distribution of income. The latter is measured by the wage share that indicates the percentage of value added going to the workers. As Table 12 shows, the wage share varies from country to country between, on average between 2010 and 2019, 68% in Switzerland and 42% in Romania. For all countries the average has been 55%. The level is relatively low in most CEE countries but also in the richest European countries (Ireland, Luxembourg, and Norway). The reason might be that, in these countries, foreign investors or, in the case of Norway, a domestic sovereign wealth fund, appropriate a larger share of GDP.

Looking at the development over the period under consideration, the average for all countries hardly changed (a decline by 0.4 percentage points). However, some countries experienced bigger changes: In Bulgaria and the Baltic countries, the wage share increased by about seven percentage points while in Ireland it decreased by 18 points and in Spain and Portugal by about seven. The seemingly dramatic decline in Ireland is also caused by the strange composition of GDP with large parts of value added resulting from the artificial and deliberate transfers of profits to firms benefitting from low taxes in Ireland (see above).

Table 12: Wage share (in percent of GDP)

Region	Country	2010	2015	2019	Average 2010-2019	Change 2010-2019
Western Europe	Austria	58,54	58,93	59,24	59,03	→
Western Europe	Belgium	65,18	63,85	61,86	64,07	↘
Western Europe	France	63,33	62,10	59,30	61,67	↘
Western Europe	Germany	61,70	62,15	63,22	62,06	↗
Western Europe	Ireland	52,69	36,81	34,55	42,91	↓
Western Europe	Luxembourg	54,84	54,75	55,82	54,56	→
Western Europe	Netherlands	65,35	63,10	61,47	63,81	↘
Western Europe	Switzerland	66,26	68,58	68,81	68,05	↗
Western Europe	United Kingdom	59,34	56,43	57,43	57,40	↘
Northern Europe	Denmark	59,94	58,57	56,19	58,46	↘
Northern Europe	Finland	59,53	57,61	54,57	56,81	↘
Northern Europe	Iceland	57,35	61,36	61,30	61,29	↗
Northern Europe	Norway	49,10	51,99	52,94	50,23	↗
Northern Europe	Sweden	53,68	55,35	54,74	55,38	↗
Southern Europe	Cyprus	57,14	49,57	49,74	52,18	↓
Southern Europe	Greece	58,05	53,05	55,88	56,32	↘
Southern Europe	Italy	59,15	58,04	61,84	59,30	↗
Southern Europe	Malta	48,60	47,44	50,87	49,65	↗
Southern Europe	Portugal	62,24	54,47	55,03	57,08	↓
Southern Europe	Spain	64,04	59,35	57,29	59,38	↓
Central and Eastern Europe	Bulgaria	44,28	50,65	51,73	49,18	↑
Central and Eastern Europe	Croatia	60,98	58,31	57,82	57,94	↘
Central and Eastern Europe	Czech Republic	54,24	51,66	56,43	54,17	↗
Central and Eastern Europe	Estonia	52,02	56,48	58,34	54,38	↑
Central and Eastern Europe	Hungary	51,18	48,42	48,89	49,98	↘
Central and Eastern Europe	Latvia	49,31	51,66	56,95	50,75	↑
Central and Eastern Europe	Lithuania	45,77	47,66	52,73	47,08	↑
Central and Eastern Europe	Poland	47,97	46,61	49,28	47,70	↗
Central and Eastern Europe	Romania	43,96	40,33	43,87	42,01	→
Central and Eastern Europe	Slovak Republic	46,15	48,50	53,42	48,94	↑
Central and Eastern Europe	Slovenia	61,21	58,48	58,04	58,92	↘
Oceania	Australia	61,40	62,10	59,61	60,42	↘
Northern America	Canada	61,18	62,26	60,83	60,84	→
Oceania	New Zealand	51,17	49,46	52,11	50,87	→
Northern America	United States	58,76	58,59	58,15	58,40	→
	Average	56,16	54,99	55,72	55,46	→

Legend: Colouring: green highest, red lowest values.
Changes: ↑: >5; ↗:< 5 and > 1; →: >-1and <1; ↘: <-5 and >-1; ↓: >-5.
Source: ILO and author's calculation.

The distribution of wealth showed a pattern similar to the income distribution without dramatic changes.

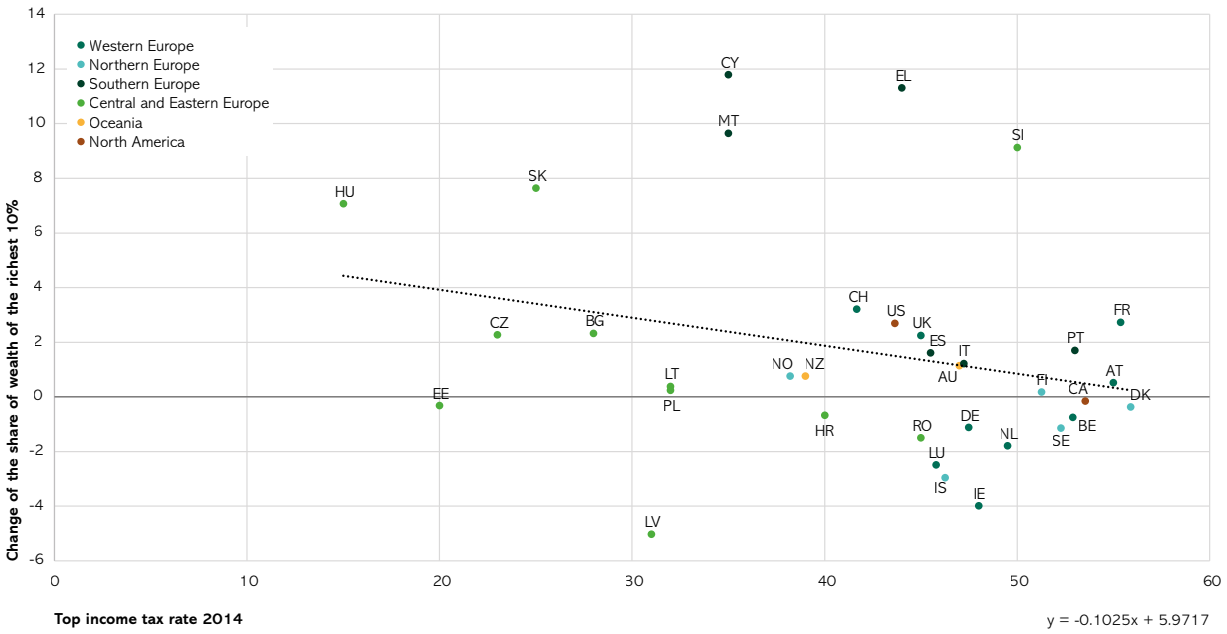
Table 13: Wealth distribution (share of wealth (in %) of the top ten percent)

Region	Country	2007	2014	2021	Change 2007-2021
Western Europe	Austria	61,32%	60,43%	61,85%	→
Western Europe	Belgium	52,93%	50,88%	52,19%	→
Western Europe	France	56,60%	58,53%	59,33%	↗
Western Europe	Germany	60,06%	58,71%	58,94%	↘
Western Europe	Ireland	70,00%	72,16%	66,02%	↘
Western Europe	Luxembourg	61,82%	64,79%	59,34%	↘
Western Europe	Netherlands	49,67%	53,58%	47,88%	↘
Western Europe	Switzerland	59,44%	61,59%	62,66%	↗
Western Europe	United Kingdom	54,44%	57,82%	57,13%	↗
Northern Europe	Denmark	51,11%	50,48%	50,74%	→
Northern Europe	Finland	55,88%	54,78%	56,06%	→
Northern Europe	Iceland	59,63%	55,69%	56,68%	↘
Northern Europe	Norway	51,44%	48,44%	52,21%	→
Northern Europe	Sweden	60,01%	59,22%	58,87%	↘
Southern Europe	Cyprus	54,58%	56,60%	66,38%	↑
Southern Europe	Greece	49,42%	59,42%	60,74%	↑
Southern Europe	Italy	54,97%	58,54%	56,19%	↗
Southern Europe	Malta	44,17%	46,57%	53,82%	↑
Southern Europe	Portugal	58,98%	59,39%	60,69%	↗
Southern Europe	Spain	55,96%	58,27%	57,58%	↗
Central and Eastern Europe	Bulgaria	56,33%	57,08%	58,66%	↗
Central and Eastern Europe	Croatia	56,71%	56,27%	56,04%	→
Central and Eastern Europe	Czech Republic	56,19%	57,25%	58,47%	↗
Central and Eastern Europe	Estonia	66,74%	66,65%	66,42%	→
Central and Eastern Europe	Hungary	60,18%	59,62%	67,26%	↑
Central and Eastern Europe	Latvia	65,59%	65,30%	60,57%	↓
Central and Eastern Europe	Lithuania	57,04%	58,21%	57,43%	→
Central and Eastern Europe	Poland	61,53%	61,55%	61,78%	→
Central and Eastern Europe	Romania	59,22%	58,21%	57,72%	↘
Central and Eastern Europe	Slovak Republic	42,08%	47,43%	49,72%	↑
Central and Eastern Europe	Slovenia	48,10%	56,68%	57,23%	↑
Oceania	Australia	55,91%	56,56%	57,06%	↗
Northern America	Canada	58,48%	58,27%	58,33%	→
Oceania	New Zealand	55,82%	56,45%	56,59%	→
Northern America	United States	68,43%	72,85%	70,68%	↗
	Average	56,88%	58,12%	58,55%	↗

Legend: Colouring: green lowest, red highest values.
Changes: ↑: >5; ↗:< 5 and > 1; →: >-1and <1; ↘: <-5 and >-1; ↓: >-5.
Source: World Inequality Database (WID) and author's calculation.

On average for all countries, the financial crisis reduced the share of the richest ten percent slightly in many countries, but the subsequent period of low interest rates led to a continuous rise of wealth inequality by about two percentage points.
However, top income tax rates (Table 5) seem to have slowed down the rise of this share somewhat. Figure 2 compares the tax rate (horizontal axis) with the growth rate of the share of wealth owned by the richest ten percent between 2007 and 2021. The trend line is given by the equation: Wealth change = -0.1025 Top tax rate + 5.9717, indicating that if one increases the top income tax rate by 10 percentage points the growth of wealth of the richest ten percent declines by 1 percentage point. A similar correlation exercise with the change of the Gini index (distribution of income) showed a much weaker correlation.

Figure 2: Correlation top income tax rate and growth of wealth of the top 10 percent (2007-2021)



Source: author's calculation

Given the small extent of changes in inequality, it is hard to discern an impact of government policies with the possible exception of low interest rates, which might have reduced income inequality but increased wealth inequality. Tax policies seem to have had little impact which is not surprising as they remained relatively unchanged over the period under consideration in most countries (see Tables 3, 4, and 5). Labour market regulation did not strongly influence income distribution or employment. Neither did stricter regulation increase unemployment nor did it reduce inequality in a significant way.

4.3.3. Outcome: Employment, income and wealth

In this sub-section, we will take a closer look on those features of the economy that are relevant for the well-being of the population, notably employment, income and wealth. As already mentioned above, labour is a source of income (and often of other types of satisfaction) but also a burden that many people want to minimise. Thus, the real source of overall welfare is productivity growth (see Table 8), which allows for higher output (and indirectly income and consumption) using the same or a lower amount of labour. The choice between higher output and more leisure time (or time spent on other activities such as care or voluntary work) is one primarily taken by individuals but also by societies in so far as they regulate working time, minimum vacations, and retirement age.

Nonetheless, unemployment and a lack of job opportunities is a problem for the individuals affected and the economy and society as a whole. While unemployment insurance reduces the negative effects of losing a job to some extent, the optimal situation is a labour market that provides jobs for all people who want to work and earn an income this way. Thus, unemployment rates indicate a poor performance of the economy and, possibly, of the public policies that are supposed to avoid or reduce it.

Table 14 shows the unemployment rates for the countries and years under consideration here. As one would expect from our analysis in the previous sub-section, unemployment increased sharply in 2009 and, to a lesser extent, in 2020. While almost all countries suffered from the two shocks of the financial crisis and the pandemic, there were substantial differences in the level of unemployment if we take the average over the whole period under consideration. Again, Greece and Spain are the most affected countries with rates above 18%. Portugal, the Slovak republic, Latvia and Croatia show double-digit average rates of unemployment, too. The best performers are Norway and Switzerland.

Focussing on the performance after the financial crisis (see last column in Table 14) and comparing the change of unemployment between 2007 and 2013 (the year with the, on average for all countries, highest rate of

unemployment), confirms the general picture (see last column in Table 14). The Mediterranean countries (Greece, Spain, Cyprus, Croatia and Portugal) suffered most being all, except Croatia, victims of the disastrous austerity policies imposed on them. The by far best performing country has been Germany being the only one that reduced its rate of unemployment between 2007 and 2013 by using its established labour market policy of state-supported furlough ("Kurzarbeit") and working-time accounts on enterprise level, which had been established by trade unions and employers together. Thus, paradoxically, the number of hours worked in Germany (see Table 9) declined together with the unemployment rate. In the pandemic, many other countries adopted this policy, too (Dauderstädt, 2021a). Learning the German lesson probably contributed to the much smaller rise of unemployment within many countries in 2020, compared to 2009. There are opposite paradox country cases such as Australia, Canada, New Zealand (and some more) where the unemployment rate increased during the crisis (2008-2013) and the number of hours worked, too. This phenomenon is probably due to more people entering the labour market.

Table 14: Unemployment rate (in%)

Region	Country	2007	2013	2019	2020	2021	Average 2007-2013	Change 2007-2013
Western Europe	Austria	4,9	5,3	4,5	5,4	6,3	5,2	→
Western Europe	Belgium	7,5	8,4	5,4	5,6	6,4	7,3	→
Western Europe	France	7,7	9,9	8,4	8,0	8,1	8,9	↗
Western Europe	Germany	8,7	5,2	3,1	3,8	3,5	5,2	↘
Western Europe	Ireland	5,0	13,7	4,9	5,6	6,6	9,5	↑
Western Europe	Luxembourg	4,1	5,8	5,6	6,8	5,2	5,5	↗
Western Europe	Netherlands	4,2	7,2	3,4	3,8	4,0	5,0	↗
Western Europe	Switzerland	3,7	4,8	4,4	4,8	5,3	4,5	↗
Western Europe	United Kingdom	5,3	7,5	3,7	4,5	4,5	5,8	↗
Northern Europe	Denmark	3,8	7,4	5,0	5,6	4,8	6,0	↗
Northern Europe	Finland	6,8	8,2	6,7	7,8	7,5	7,9	↗
Northern Europe	Iceland	2,3	5,4	3,5	5,5	5,4	4,7	↗
Northern Europe	Norway	2,5	3,4	3,7	4,4	5,0	3,7	→
Northern Europe	Sweden	6,2	8,1	6,8	8,3	8,7	7,5	↗
Southern Europe	Cyprus	3,9	15,9	7,1	7,6	6,1	9,3	↑
Southern Europe	Greece	8,4	27,5	17,3	16,3	14,8	18,2	↑
Southern Europe	Italy	6,1	12,1	9,9	9,2	9,8	9,8	↑
Southern Europe	Malta	6,5	6,1	3,6	4,3	3,5	5,3	→
Southern Europe	Portugal	8,0	16,2	6,5	6,8	6,6	10,2	↑
Southern Europe	Spain	8,2	26,1	14,1	15,5	14,7	18,2	↑
Central and Eastern Europe	Bulgaria	6,9	12,9	4,2	5,1	5,4	8,0	↑
Central and Eastern Europe	Croatia	9,9	17,3	6,6	7,5	8,7	11,7	↑
Central and Eastern Europe	Czech Republic	5,3	6,9	2,0	2,5	2,9	4,8	↗
Central and Eastern Europe	Estonia	4,6	8,6	4,4	6,8	6,3	8,0	↗
Central and Eastern Europe	Hungary	7,4	10,2	3,4	4,3	4,1	7,2	↗
Central and Eastern Europe	Latvia	6,1	11,9	6,3	8,1	7,6	10,8	↑
Central and Eastern Europe	Lithuania	4,3	11,8	6,3	8,5	7,9	9,7	↑
Central and Eastern Europe	Poland	9,6	10,3	3,3	3,2	3,4	7,1	→
Central and Eastern Europe	Romania	6,4	7,1	3,9	5,0	5,2	6,0	→
Central and Eastern Europe	Slovak Republic	11,1	14,2	5,8	6,7	6,7	10,5	↗
Central and Eastern Europe	Slovenia	4,8	10,1	4,4	5,0	4,4	6,8	↑
Oceania	Australia	4,4	5,7	5,2	6,5	5,1	5,4	↗
Northern America	Canada	6,0	7,1	5,7	9,5	7,5	7,1	→
Oceania	New Zealand	3,7	5,8	4,1	4,6	4,1	5,2	↗
Northern America	United States	4,6	7,4	3,7	8,1	5,5	6,4	↗
	Average	6,0	10,3	5,7	6,6	6,4	7,9	↗

Legend: Colouring: green lowest, red highest values.
Changes: ↑: >5; ↗: < 5 and > 1; →: >-1and <1; ↘ : >-1.
Source: World Development Indicators and author's calculation.

As explained above, paid work is not only a privilege but also a burden. People want to have and need time for reproduction (in order to be able to continue working) and for other purposes including care work. Time-use analysis shows that paid work takes up a similar amount of time as unpaid work and leisure with the bulk of time used for personal care (including sleep, eating etc.). There are large differences between men and women who do much more unpaid than paid work. Historically, the number of hours worked per employee has declined due to higher productivity. During the time period between 2007 and 2020 a slow decline (on average for all countries) could be observed, too (see last column in Table 15). The pandemic caused a stronger drop of, on average, by 50 hours, that is likely to be reversed later. Numbers substantially differ from country to country. In poorer countries (with lower productivity) employees tend to work more hours per year. In our sample, the average number for the whole time period is highest in Malta and Greece with over 1,600 hours and lowest in mostly rich countries such as the Netherlands, Norway, Luxembourg, Denmark, France and Germany with values close to or below 1,200 (Cyprus, an outlier, has the lowest value with 1,099). These low values mostly reflect a larger share of part-time workers.

Table 15: Number of hours worked per employee and year

Region	Country	2007	2014	2020	Average 2007-2020	Change 2007-2020
Western Europe	Austria	1332	1269	1174	1275	-158
Western Europe	Belgium	1325	1310	1181	1296	-144
Western Europe	France	1182	1200	1121	1187	-61
Western Europe	Germany	1243	1201	1125	1198	-118
Western Europe	Ireland	1487	1378	1393	1401	-95
Western Europe	Luxembourg	1247	1180	1162	1211	-85
Western Europe	Netherlands	1155	1168	1167	1165	12
Western Europe	Switzerland	1398	1321	1261	1338	-137
Western Europe	United Kingdom	1247	1247	1102	1227	-145
Northern Europe	Denmark	1164	1171	1122	1163	-42
Northern Europe	Finland	1326	1297	1284	1303	-42
Northern Europe	Iceland	1206	1132	1124	1155	-82
Northern Europe	Norway	1148	1163	1161	1161	13
Northern Europe	Sweden	1215	1224	1182	1221	-33
Southern Europe	Cyprus	1092	1048	1060	1099	-33
Southern Europe	Greece	1705	1661	1469	1653	-236
Southern Europe	Italy	1555	1468	1359	1492	-197
Southern Europe	Malta	1796	1650	1616	1721	-180
Southern Europe	Portugal	1480	1473	1393	1472	-87
Southern Europe	Spain	1440	1417	1328	1422	-112
Central and Eastern Europe	Bulgaria					0
Central and Eastern Europe	Croatia	1608	1589	1608	1591	0
Central and Eastern Europe	Czech Republic	1525	1505	1431	1509	-94
Central and Eastern Europe	Estonia	1616	1487	1363	1490	-252
Central and Eastern Europe	Hungary	1489	1467	1391	1461	-98
Central and Eastern Europe	Latvia	1523	1424	1307	1418	-215
Central and Eastern Europe	Lithuania	1420	1410	1353	1420	-67
Central and Eastern Europe	Poland	1527	1485	1413	1477	-115
Central and Eastern Europe	Romania	1631	1520	1477	1542	-154
Central and Eastern Europe	Slovak Republic	1502	1490	1323	1476	-180
Central and Eastern Europe	Slovenia	1422	1435	1300	1406	-122
Oceania	Australia	1449	1420	1367	1420	-82
Northern America	Canada	1399	1389	1342	1385	-57
Oceania	New Zealand	1382	1383	1391	1384	9
Northern America	United States	1405	1409	1407	1405	3
	Average	1401	1364	1302	1369	-100

*Note: * figures refer to 2020; the years for the last column were chosen to present the long-term trend by excluding the dramatic drop in 2021 caused by the pandemic.*
Legend: Colouring: green lowest, red highest values. Source WDI, OECD and Eurostat and author's calculation.

Lower unemployment and more hours worked increase both GDP and thus income. Income is measured according to different concepts. Gross national income (GNI) differs from GDP as it includes income of citizens living and working abroad while it excludes value added in the country but earned by foreigners (often foreign investors).
Other concepts are net national income, which subtracts depreciation from gross national income, and disposable income which subtracts taxes and social security contributions and adds transfers received. Levels and growth rates of GDP and GNI are very similar for most countries.

Table 16: Growth of gross national income (in %)

Region	Country	2008	2009	2015	2020	2021	Average 2008-2021
Western Europe	Austria	1,81%	-3,93%	0,61%	-5,05%	3,48%	0,66%
Western Europe	Belgium	-0,61%	-0,58%	2,11%	-4,73%	4,77%	0,96%
Western Europe	France	0,25%	-2,05%	2,11%	-8,02%	8,12%	0,91%
Western Europe	Germany	-0,21%	-3,14%	2,70%	-3,45%	2,18%	1,14%
Western Europe	Ireland	-4,43%	-7,71%	20,61%	2,09%	11,59%	4,29%
Western Europe	Luxembourg	-4,78%	-20,76%	-8,94%	4,53%	10,54%	1,93%
Western Europe	Netherlands	-1,59%	-2,57%	2,69%	-5,11%	5,22%	0,82%
Western Europe	Switzerland	-4,66%	7,20%	3,16%	-4,14%		0,86%
Western Europe	United Kingdom	-1,44%	-3,23%	2,74%	-12,57%	9,24%	1,04%
Northern Europe	Denmark	1,07%	-5,33%	2,00%	-0,59%	5,76%	1,60%
Northern Europe	Finland	-0,42%	-6,92%	1,69%	-0,88%	3,52%	0,48%
Northern Europe	Iceland						
Northern Europe	Norway	5,76%	-8,52%	-1,97%	-5,85%	15,88%	1,61%
Northern Europe	Sweden	-0,10%	-5,01%	3,43%	-1,47%	4,80%	1,65%
Southern Europe	Cyprus	8,97%	-0,66%	5,54%	-5,92%	4,93%	1,42%
Southern Europe	Greece	-1,08%	-3,35%	0,62%	-8,41%	7,21%	-1,72%
Southern Europe	Italy	-2,60%	-3,12%	0,68%	-7,85%	6,04%	-0,27%
Southern Europe	Malta	7,41%	-4,72%	9,11%	-9,68%	12,91%	4,46%
Southern Europe	Portugal	-1,13%	-1,11%	2,46%	-6,67%	5,13%	0,52%
Southern Europe	Spain	0,07%	-1,79%	4,36%	-10,69%	5,58%	0,26%
Central and Eastern Europe	Bulgaria	8,90%	-1,92%	1,07%	-4,73%	8,68%	2,28%
Central and Eastern Europe	Croatia	1,03%	-7,66%	4,63%	-6,35%	11,26%	0,96%
Central and Eastern Europe	Czech Republic	2,08%	-4,44%	5,57%	-3,62%	4,01%	1,65%
Central and Eastern Europe	Estonia	-1,81%	-11,62%	2,81%	0,69%	9,46%	2,74%
Central and Eastern Europe	Hungary	1,36%	-3,90%	3,80%	-2,76%	3,59%	1,88%
Central and Eastern Europe	Latvia	-1,98%	-7,14%	3,65%	0,87%	3,04%	1,15%
Central and Eastern Europe	Lithuania	5,41%	-11,99%	1,45%	1,12%	0,52%	1,93%
Central and Eastern Europe	Poland	5,62%	1,75%	4,41%	-1,68%	5,87%	3,39%
Central and Eastern Europe	Romania	12,86%	-4,54%	2,48%	-3,84%	4,93%	2,87%
Central and Eastern Europe	Slovak Republic	5,33%	-5,09%	3,48%	-2,59%	2,17%	1,63%
Central and Eastern Europe	Slovenia	2,33%	-4,79%	0,84%	-3,22%	5,69%	1,28%
Oceania	Australia	5,16%	3,98%	0,41%	1,26%	5,71%	3,05%
Northern America	Canada	2,46%	-6,15%	-1,55%	-6,05%	9,22%	1,62%
Oceania	New Zealand	-2,19%	3,68%	4,26%	-0,04%	3,49%	3,07%
Northern America	United States	-1,68%	-1,54%	3,10%	-2,55%	5,57%	1,85%
	Average	1,39%	-4,08%	2,83%	-3,76%	6,37%	1,60%

Legend: Colouring: green highest, red lowest values.
Source: WDI and author's calculation.

There are two major exceptions in our sample: Ireland and Luxembourg. Both countries are (relative) tax havens and thus hosts to many foreign enterprises that allocate profits, partly through clever transfer pricing, to their subsidiaries there to enjoy lower corporate taxes. These profits are part of the respective GDP but not of GNI as they are earned by foreigners. On average, over the period under consideration, about 30% of Luxembourg's GDP and 24% of Ireland's were earned by foreigners lowering these countries' GNI. Their GDP has grown faster than their GNI, too (by 27 percentage points for Ireland and 35 percentage points for Luxemburg). Some low-wage countries, often in Central and Eastern Europe (CEE), with a strong presence of large foreign companies (e.g. the Czech Republic with Skoda or Hungary with Audi and low taxes) also have lower GNI (as the profits created there go to the foreign owners).

There also are countries whose GNI is higher than their GDP as they receive incomes from abroad. In the case of richer countries these revenues stem mostly from investment in foreign countries. Thus, Sweden, France, Germany, Switzerland, and the United States have higher GNI. In the end, two countervailing factors influence the difference between GNI and GDP: In some rich countries with a high share of foreign workers who send remittances to their countries of origin these outflows reduce or even overcompensate the inflows of income from investment abroad. In some poorer countries, which are likely to receive remittances due to a large emigration of workers (e.g. Poland or Romania), GNI still remains smaller than GDP as the outflows of profits from FDI are higher than the incoming remittances.

High income levels are closely correlated with high levels of wealth. On average for all countries, wealth per adult has grown by almost 33% since 2007 while income only increased by 18.6%. The growth of wealth suffered similar setbacks as the growth of GDP or GNI: 2009 and 2020 were years of declining wealth. But both shocks were compensated by later growth. The best performing countries over the whole period were mostly rich ones such as Norway, Sweden, Germany, Canada, and Switzerland, but also some poorer countries from CEE such as Lithuania, Poland, Hungary, Bulgaria, and Romania while among the worst performers one finds again the countries of the Eurozone's Southern periphery: Greece, Spain, Cyprus, and Portugal. Surprisingly, Luxembourg experienced a strong decline of wealth, too (-28.8%). Another underperforming rich country is the United Kingdom (0.9%). Both are economies with an oversized financial sector that is particularly affected by financial crises.[14]

[14] This explanation leaves the question open why Luxembourg experienced the biggest fall of wealth in 2019, that is before the pandemic shocked the markets in 2020.

Table 17: Growth of net wealth per adult

Region	Country	2008	2009	2015	2019	2020	2021	2008-2021
Western Europe	Austria	1,11%	-1,60%	-0,47%	2,54%	-4,12%	6,07%	15,18%
Western Europe	Belgium	0,21%	-1,16%	1,65%	0,67%	-0,84%	6,20%	15,05%
Western Europe	France	-4,02%	-4,92%	-1,63%	3,07%	3,04%	5,63%	14,47%
Western Europe	Germany	2,06%	-0,76%	5,94%	4,95%	-3,35%	2,56%	54,36%
Western Europe	Ireland	-1,56%	-7,87%	0,03%	3,31%	24,18%	16,35%	119,00%
Western Europe	Luxembourg	-11,34%	0,99%	2,08%	-21,68%	-7,77%	5,44%	28,83%
Western Europe	Netherlands	2,82%	1,64%	4,60%	5,41%	7,48%	6,79%	35,05%
Western Europe	Switzerland	4,64%	-3,26%	5,17%	1,29%	5,00%	4,65%	47,22%
Western Europe	United Kingdom	-7,25%	-7,50%	5,63%	-0,79%	-10,72%	8,48%	0,92%
Northern Europe	Denmark	-4,34%	-6,64%	6,96%	-9,96%	18,05%	7,20%	38,86%
Northern Europe	Finland	-1,77%	-3,52%	0,35%	2,19%	1,15%	2,98%	14,05%
Northern Europe	Iceland	-23,57%	-17,76%	7,76%	-1,29%	-10,49%	3,74%	19,83%
Northern Europe	Norway	0,77%	2,35%	13,77%	3,93%	9,57%	3,51%	100,67%
Northern Europe	Sweden	-3,12%	7,29%	7,04%	9,44%	1,88%	6,17%	91,21%
Southern Europe	Cyprus	0,43%	-2,78%	2,55%	9,35%	-3,40%	5,66%	-5,04%
Southern Europe	Greece	-3,85%	-6,51%	-3,38%	1,81%	-11,18%	11,84%	32,31%
Southern Europe	Italy	-1,34%	-2,19%	-2,54%	-1,06%	-1,10%	8,08%	11,50%
Southern Europe	Malta	1,53%	-5,09%	5,53%	0,82%	-9,90%	5,93%	13,82%
Southern Europe	Portugal	-0,25%	-3,06%	2,16%	-2,96%	-7,98%	6,86%	-4,74%
Southern Europe	Spain	-0,78%	-8,52%	0,38%	0,18%	-13,20%	6,67%	23,12%
Central and Eastern Europe	Bulgaria	9,76%	2,79%	1,42%	3,26%	-1,88%	10,73%	37,94%
Central and Eastern Europe	Croatia	-0,15%	-7,28%	3,99%	5,66%	-8,03%	16,32%	23,57%
Central and Eastern Europe	Czech Republic	3,44%	-1,69%	2,51%	2,63%	2,81%	3,58%	23,78%
Central and Eastern Europe	Estonia							
Central and Eastern Europe	Hungary	0,79%	-3,16%	7,85%	6,93%	-4,10%	9,04%	54,55%
Central and Eastern Europe	Latvia	1,40%	-5,13%	5,48%	4,76%	-2,33%	6,04%	32,24%
Central and Eastern Europe	Lithuania	7,78%	-8,52%	4,40%	-1,26%	-8,16%	7,58%	70,08%
Central and Eastern Europe	Poland	4,67%	-0,37%	5,36%	7,09%	0,72%	9,27%	71,84%
Central and Eastern Europe	Romania	5,18%	-6,41%	4,86%	10,10%	-3,61%	6,48%	37,93%
Central and Eastern Europe	Slovak Republic	7,99%	-0,94%	2,76%	2,35%	-3,79%	3,65%	17,22%
Central and Eastern Europe	Slovenia	1,07%	-6,15%	-1,33%	2,36%	-11,66%	9,83%	-6,25%
Oceania	Australia	1,72%	-5,50%	6,04%	-1,58%	0,55%	2,14%	15,51%
Northern America	Canada	-4,78%	1,28%	5,28%	2,92%	5,95%	4,81%	61,98%
Oceania	New Zealand	-2,39%	-1,87%	6,13%	2,96%	-3,58%	2,68%	21,37%
Northern America	United States	-11,65%	-13,70%	4,18%	3,67%	10,30%	8,85%	43,01%
	Average	-0,73%	-3,75%	3,60%	1,85%	-1,19%	6,82%	25,85%

Legend: Colouring: green highest, red lowest values.
Source WID and author's calculation.

How did public policies influence these developments? The obvious candidate is monetary policy. As explained above, low interest rates, as they prevailed between 2012 and 2022, caused a rise of asset prices which explains the higher growth of wealth in comparison to GNI. Rising interest rates since 2022 (see Table 2) and geopolitical crises led to a decline of wealth in Europe and North America (Czerepak 2023, pp. 2-4) which is not represented in our Table 17. Regarding fiscal and tax policies, an assessment becomes more difficult. Expansionary fiscal policies usually were adopted during crises or recessions when income and wealth were declining. Thus, simple correlations often suggest that they are harmful rather than helpful. In most countries, neither tax policies (share of taxes on income and on goods and services, Table 3 and 4) nor inequality changed much during the period under consideration.

4.3.4. Trust and satisfaction

As important as the economic features considered in the previous subsections are, they are only partially responsible for the well-being and happiness of people. Arguably, the most important indicator for the quality of human life is its duration (life expectancy).[15] As Table 18 shows, between 2007 and 2020, life expectancy increased in all countries except the United States by, on average, two years. The highest increase by more than four years could be observed in the Baltic countries, albeit from a relatively low level (less than 73 years in 2007). But Bulgaria and Romania, two countries with similarly low values in 2007, improved much less.

Table 18: Life expectancy (in years)

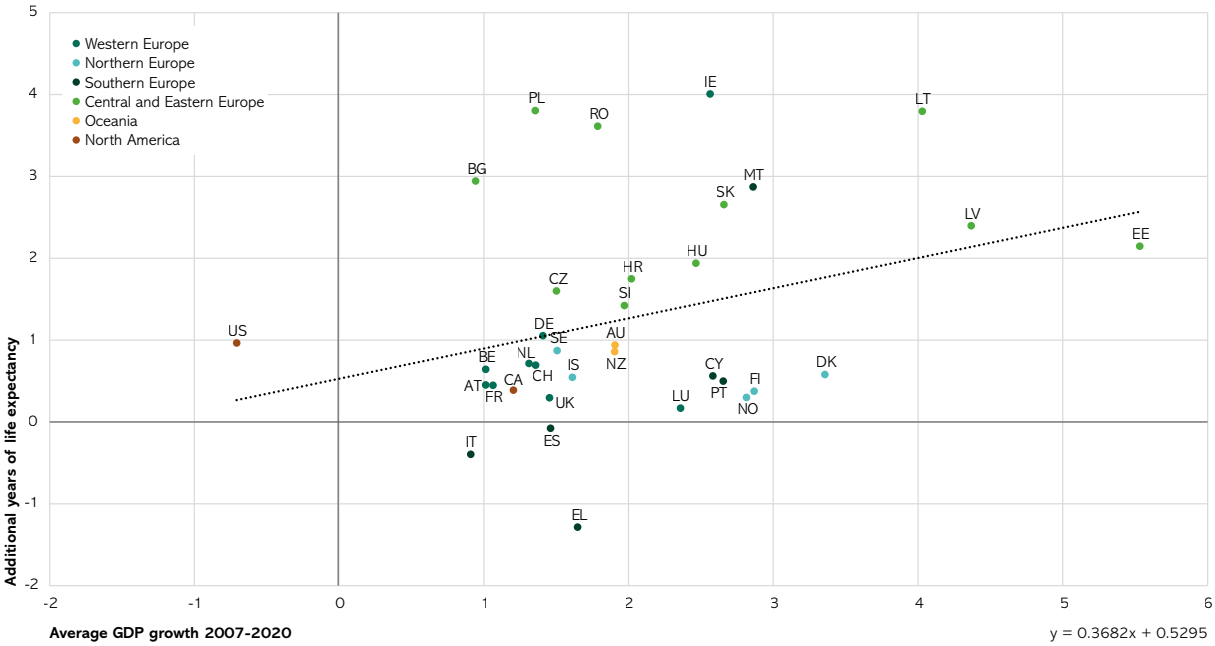
Region	Country	2007	2014	2020	Change 2007-2020	Average 2007-2020
Western Europe	Austria	80,18	81,49	81,19	1,01	81,09
Western Europe	Belgium	79,78	81,29	80,80	1,01	80,77
Western Europe	France	81,11	82,72	82,18	1,06	82,11
Western Europe	Germany	79,53	81,09	80,94	1,41	80,53
Western Europe	Ireland	79,64	81,35	82,20	2,56	81,21
Western Europe	Luxembourg	79,38	82,23	81,74	2,36	81,52
Western Europe	Netherlands	80,10	81,71	81,41	1,31	81,22
Western Europe	Switzerland	81,74	83,20	83,10	1,36	82,87
Western Europe	United Kingdom	79,45	81,30	80,90	1,45	80,74
Northern Europe	Denmark	78,20	80,70	81,55	3,36	80,13
Northern Europe	Finland	79,26	81,18	82,13	2,87	80,86
Northern Europe	Iceland	81,45	82,86	83,07	1,61	82,38
Northern Europe	Norway	80,40	82,10	83,21	2,81	81,83
Northern Europe	Sweden	80,90	82,25	82,41	1,51	81,97
Southern Europe	Cyprus	78,81	80,77	81,39	2,58	80,40
Southern Europe	Greece	79,44	81,39	81,09	1,65	80,87
Southern Europe	Italy	81,43	83,09	82,34	0,91	82,48
Southern Europe	Malta	79,79	82,05	82,65	2,86	81,50
Southern Europe	Portugal	78,32	81,12	80,98	2,65	80,35
Southern Europe	Spain	80,87	83,23	82,33	1,46	82,53
Central and Eastern Europe	Bulgaria	72,66	74,47	73,61	0,94	74,16
Central and Eastern Europe	Croatia	75,71	77,48	77,72	2,02	77,14
Central and Eastern Europe	Czech Republic	76,72	78,82	78,23	1,50	78,16
Central and Eastern Europe	Estonia	72,81	77,03	78,35	5,53	76,58
Central and Eastern Europe	Hungary	73,15	75,76	75,62	2,47	75,12
Central and Eastern Europe	Latvia	71,02	74,12	75,39	4,37	73,91
Central and Eastern Europe	Lithuania	70,90	74,52	74,93	4,03	74,01
Central and Eastern Europe	Poland	75,24	77,60	76,60	1,36	76,85
Central and Eastern Europe	Romania	72,57	74,91	74,35	1,79	74,39
Central and Eastern Europe	Slovak Republic	74,21	76,81	76,87	2,66	76,21
Central and Eastern Europe	Slovenia	78,56	81,08	80,53	1,97	80,26
Oceania	Australia	81,29	82,30	83,20	1,91	82,18
Northern America	Canada	80,54	81,80	81,75	1,20	81,55
Oceania	New Zealand	80,15	81,40	82,06	1,90	81,22
Northern America	United States	77,99	78,84	77,28	-0,71	78,46
	Average	78,10	80,12	80,12	2,02	79,65

Legend: Colouring: green highest, red lowest values.
Source: WDI and author's calculation.

[15] We neglect the issue of health-adjusted life years for the time being. Longer lives mean longer lives with disease or disability (https://ourworldindata.org/grapher/years-lived-with-disability-vs-gdp-per-capita)

Life expectancy is highly correlated with GDP growth, as can be seen in Figure 3. The trend is given by the equation: LIFE = 0.37GDP + 0.53 indicating that a country with an average growth rate of GDP between 2007 and 2021 that is higher by one percentage point experiences an additional rise of life expectancy by 0.37 years, on average. The Baltic top performers are clearly visible in the upper right corner of Figure 3. The correlation between income levels and life expectancy exists within countries, too. Richer people tend to have higher life expectancies in all countries due to various factors such as healthier lifestyles or better medical support. As shown below (Figure 6) inequality within countries affects the average life expectancy, too.

Figure 3: Changes of GDP and life expectancy



Source: author's calculation

A less objective but nonetheless relevant feature is the subjective evaluation of the quality of life by the citizens. Life satisfaction can be "measured" on a scale from 0 to 10 with 10 indicating fullest satisfaction. Actually, in 2023, the values in the countries of our sample range from 5.5 (Bulgaria) to 7.6 (Denmark). As the colouring of Table 19 clearly shows, the countries of Europe's Southern and Eastern periphery were the least happy ones. However, the largest rises of life satisfaction (above one point) between 2012 and 2023 occurred in CEE countries such as Bulgaria, Romania and the three Baltic countries. The largest declining values, though on a smaller scale (less than 0.6), could be observed in Canada, USA, Ireland and Spain.

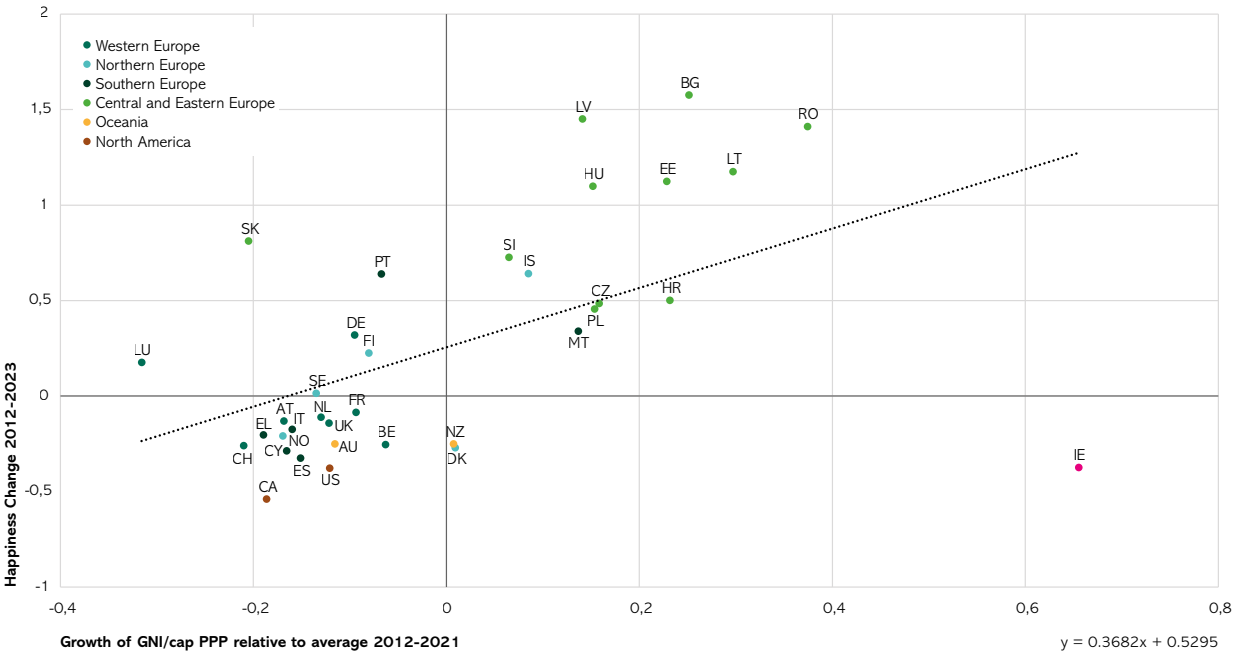
Table 19: Life satisfaction / happiness (selected years 2012, 2017, 2023)

Region	Country	2012	2017	2023	Average 2012-2023	Change 2012-2023
Western Europe	Austria	7,23	7,01	7,10	7,11	↘
Western Europe	Belgium	7,11	6,89	6,86	6,95	↘
Western Europe	France	6,75	6,44	6,66	6,62	→
Western Europe	Germany	6,57	6,95	6,89	6,80	↗
Western Europe	Ireland	7,28	6,98	6,91	7,06	↘
Western Europe	Luxembourg	7,05	6,86	7,23	7,05	↗
Western Europe	Netherlands	7,51	7,38	7,40	7,43	↘
Western Europe	Switzerland	7,50	7,49	7,24	7,41	↘
Western Europe	United Kingdom	6,94	6,71	6,80	6,82	↘
Northern Europe	Denmark	7,86	7,52	7,59	7,65	↘
Northern Europe	Finland	7,58	7,47	7,80	7,62	↗
Northern Europe	Iceland	6,89	7,50	7,53	7,31	↗
Northern Europe	Norway	7,52	7,54	7,32	7,46	↘
Northern Europe	Sweden	7,38	7,28	7,40	7,35	→
Southern Europe	Cyprus	6,42	5,62	6,13	6,06	↘
Southern Europe	Greece	6,13	5,23	5,93	5,76	↘
Southern Europe	Italy	6,58	5,96	6,40	6,32	↘
Southern Europe	Malta	5,96	6,53	6,30	6,26	↗
Southern Europe	Portugal	5,33	5,20	5,97	5,50	↗
Southern Europe	Spain	6,76	6,40	6,44	6,53	↘
Central and Eastern Europe	Bulgaria	3,89	4,71	5,47	4,69	↑
Central and Eastern Europe	Croatia	5,62	5,29	6,13	5,68	↗
Central and Eastern Europe	Czech Republic	6,36	6,61	6,85	6,60	↗
Central and Eastern Europe	Estonia	5,33	5,61	6,46	5,80	↑
Central and Eastern Europe	Hungary	4,94	5,32	6,04	5,44	↑
Central and Eastern Europe	Latvia	4,76	5,85	6,21	5,61	↑
Central and Eastern Europe	Lithuania	5,59	5,90	6,76	6,08	↑
Central and Eastern Europe	Poland	5,80	5,97	6,26	6,01	↗
Central and Eastern Europe	Romania	5,18	5,82	6,59	5,86	↑
Central and Eastern Europe	Slovak Republic	5,66	6,10	6,47	6,07	↗
Central and Eastern Europe	Slovenia	5,92	5,76	6,65	6,11	↗
Oceania	Australia	7,34	7,28	7,09	7,24	↘
Northern America	Canada	7,50	7,32	6,96	7,26	↘
Oceania	New Zealand	7,37	7,31	7,12	7,27	↘
Northern America	United States	7,27	6,99	6,89	7,05	↘
	Average	6,48	6,48	6,74	6,57	↗

Legend: Colouring: green highest, red lowest values.
Changes: ↑: >1; ↗: < 1 and > 0.1; →: >-0.1and <0.1; ↘: >-0.1.
Source: World Happiness Report and author's calculation.

Repeating the assessment we did with life expectancy, one can correlate GDP growth with happiness (life satisfaction). The counterintuitive result of a negative correlation matches with more general findings of the happiness research ("Easterlin Paradox") that show that above a certain level of income per capita (about 30,000 Euros) an even higher income does not increase happiness or even reduces it (Rustichini/Preto, 2014). If we look, however, on how life satisfaction evolves when the GNI per capita (measured at PPP) grows faster than the average of our country sample, a positive correlation can be seen in Figure 4. This correlation is mainly driven by the CEE countries that combine higher growth with clear rises of happiness, albeit both starting at low levels. The group of slow growing rich countries in the lower left corner of Figure 4 confirm the sceptical findings of Easterlin and Rustichini/Preto.

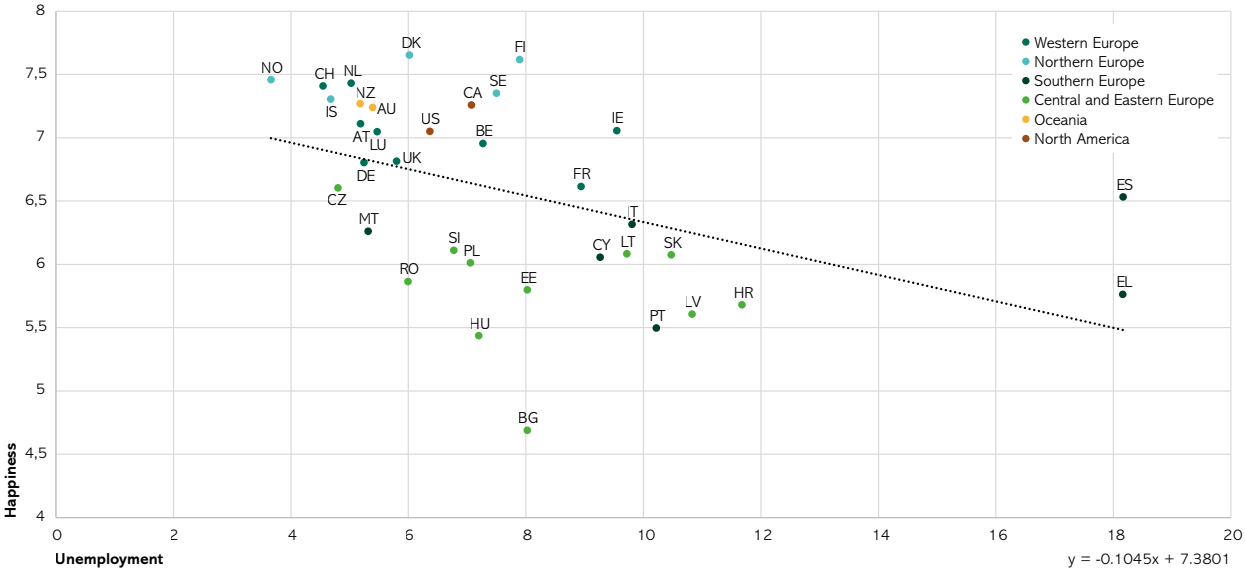
Figure 4: GNI growth and change of happiness



Source: author's calculation

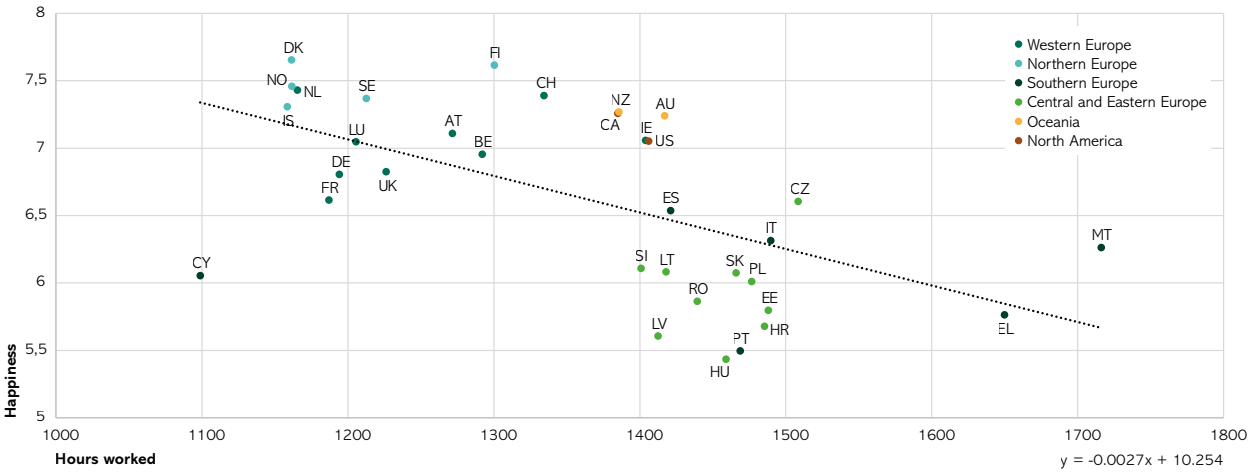
Although unemployment is a major problem to societies and individuals, work as such is not an unmitigated benefit, but rather often a necessity to earn an income. This ambiguous role of labour is reflected in the relationship between work and happiness. As Figures 5 and 6 show, on the one hand, unemployment is correlated negatively with happiness as one would expect. But, on the other hand, the number of hours worked per person is correlated negatively, too. The happier people are, the more likely they are to have a job (Figure 5) and the fewer hours of work that job requires (Figure 6). On average, ten additional percentage points of unemployment (= difference between Finland and Spain) lower the happiness score by one point, the same as 400 hours more per person (= difference between Austria and Greece).

Figure 5: Unemployment (average between 2007 and 2021) and happiness



Source: author's calculation

Figure 6: Hours worked per person (average 2007-2020) and happiness



Source: author's calculation

Finally, we consider the development of trust in government which is a major outcome of government action. Trust in government might be linked to life satisfaction discussed above, as people with higher life satisfaction tend to participate more actively in politics (Flavin and Keane, 2011). Trust levels vary strongly among countries (see Table 20)[16], with the average over the whole period ranging from 80.8% for Switzerland and 73.7% for Luxembourg to 24.3% for Latvia and 24.5 % for Greece. The change between 2006 and 2021 varies substantially, too. USA and UK experienced the strongest declines (by 15 and 10 percentage points, respectively) while trust in government has grown in Iceland by almost 40 percentage points and in Germany by 28.3. Generally, trust in government declined in many countries during the financial crisis and experienced a strong rise in 2020 when people felt protected by their governments during the pandemic.[17]

[16] We have no data on the five EU countries that are not members of OECD (Bulgaria, Croatia, Cyprus, Malta, Romania)
[17] As a more detailed empirical study for the Netherlands confirms (van der Meer et al. 2023).

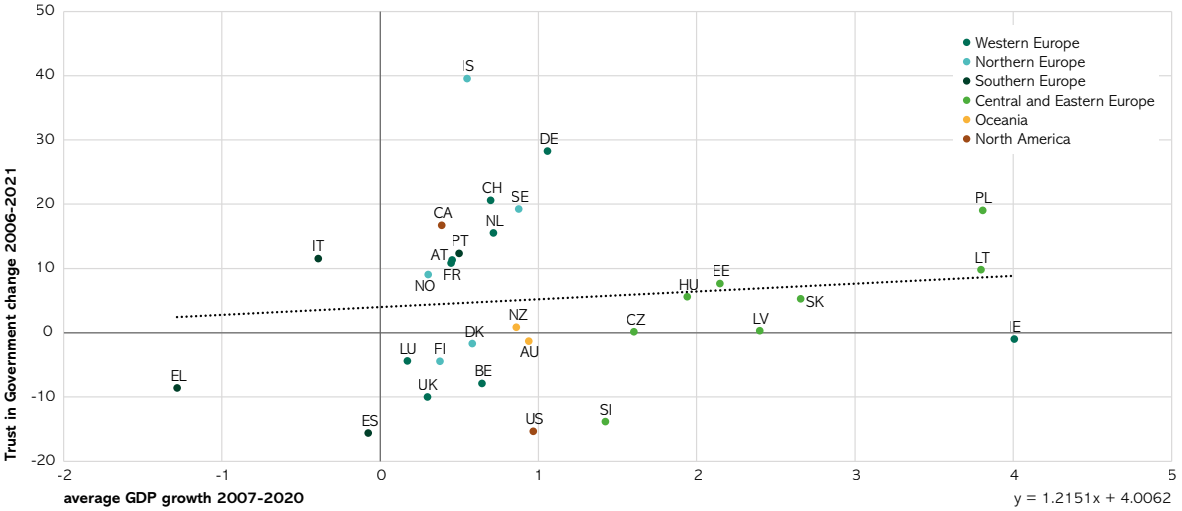
Table 20: Trust in Government

Region	Country	2006	2013	2020	2021	Average 2006-2021	Change 2006-2021
Western Europe	Austria	49,7	41,7	62,6	61,0	47,2	↑
Western Europe	Belgium	55,2	55,4	29,5	47,3	42,5	↘
Western Europe	France	32,5	39,5	41,0	43,4	35,3	↑
Western Europe	Germany	32,2	55,8	65,4	60,5	56,4	↑
Western Europe	Ireland	63,3	28,5	58,8	62,3	50,9	→
Western Europe	Luxembourg	82,4	73,7		78,0	73,7	↘
Western Europe	Netherlands	42,9	54,3	78,1	58,5	60,1	↑
Western Europe	Switzerland	63,2		84,6	83,8	80,8	↑
Western Europe	United Kingdom	49,5	37,9	34,7	39,5	40,9	↓
Northern Europe	Denmark	66,9	39,1	71,6	65,2	56,4	↘
Northern Europe	Finland	75,8	42,1	80,9	71,4	58,8	↘
Northern Europe	Iceland	23,8	45,7	59,2	63,4	45,9	↑
Northern Europe	Norway	68,3		82,9	77,4	68,4	↗
Northern Europe	Sweden	44,1	58,0	67,1	63,4	58,1	↑
Southern Europe	Cyprus						
Southern Europe	Greece	48,8	14,4	39,7	40,2	24,5	
Southern Europe	Italy	23,9	14,6	37,5	35,4	26,8	↑
Southern Europe	Malta						
Southern Europe	Portugal	45,2	17,9	61,5	57,6	37,7	↑
Southern Europe	Spain	52,8	18,5	38,2	37,2	30,0	↓
Central and Eastern Europe	Bulgaria						
Central and Eastern Europe	Croatia						
Central and Eastern Europe	Czech Republic	28,3	24,3	31,9	28,4	28,4	→
Central and Eastern Europe	Estonia	44,2	26,1	46,5	51,9	39,7	↗
Central and Eastern Europe	Hungary	36,1	32,8	42,9	41,7	35,2	↗
Central and Eastern Europe	Latvia	29,1	23,4	30,7	29,5	24,3	→
Central and Eastern Europe	Lithuania	20,6	38,4	47,4	30,4	30,4	↗
Central and Eastern Europe	Poland	6,9	16,4	27,3	25,9	32,4	↑
Central and Eastern Europe	Romania						
Central and Eastern Europe	Slovak Republic	16,3	28,3	30,7	21,6	30,2	↗
Central and Eastern Europe	Slovenia	47,8	16,3	45,3	33,9	28,2	↓
Oceania	Australia	53,2	45,6	44,6	51,9	48,2	↘
Northern America	Canada	44,3	50,6	60,0	61,0	57,3	↑
Oceania	New Zealand	62,6	54,4	62,9	63,5	61,2	→
Northern America	United States	55,8	28,9	46,5	40,5	36,4	↓
	Average	45,5	36,5	52,1	50,9		

*Note: * 2008; **2019. Legend: Colouring: green highest, red lowest values.*
Changes: ↑: >10; ↗:< 10 and > 0.1; →: >-0.1and <0.1; ↘: >-0.1 and >-10; ↓: <-10.
Source: OECD: https://data.oecd.org/gga/trust-in-government.htm.

Again, we correlate the change in trust between 2006 and 2022 with the average rate of GDP growth. The trend (see Figure 7) is given by the equation: Trust = 1.2151 GDP + 4.0062 indicating that, on average, one percentage point higher growth increases the rise of trust by 1.2 percentage points. This relatively weak correlation is also visible in the large dispersion of the individual country cases where, for instance Ireland had no change in the level of trust in spite of high growth while trust in the slow-growth countries Iceland, Germany, Switzerland and Sweden increased strongly. One can safely assume that GDP growth, which might or might not reflect a government's successful economic policy, is only one possible source of trust. The strong losses in the US and the UK, for instance, are likely to be caused by the growing polarisation of their societies (between the two major parties in the US and over Brexit in the UK). On the contrary, the strong rises in Iceland and Germany could be explained by the very low levels of trust before 2010, when Iceland suffered from a massive banking crisis and Germany was considered the sick man of Europe and subject to painful reforms (Agenda 2010).

Figure 7: GDP growth and change in the trust in government

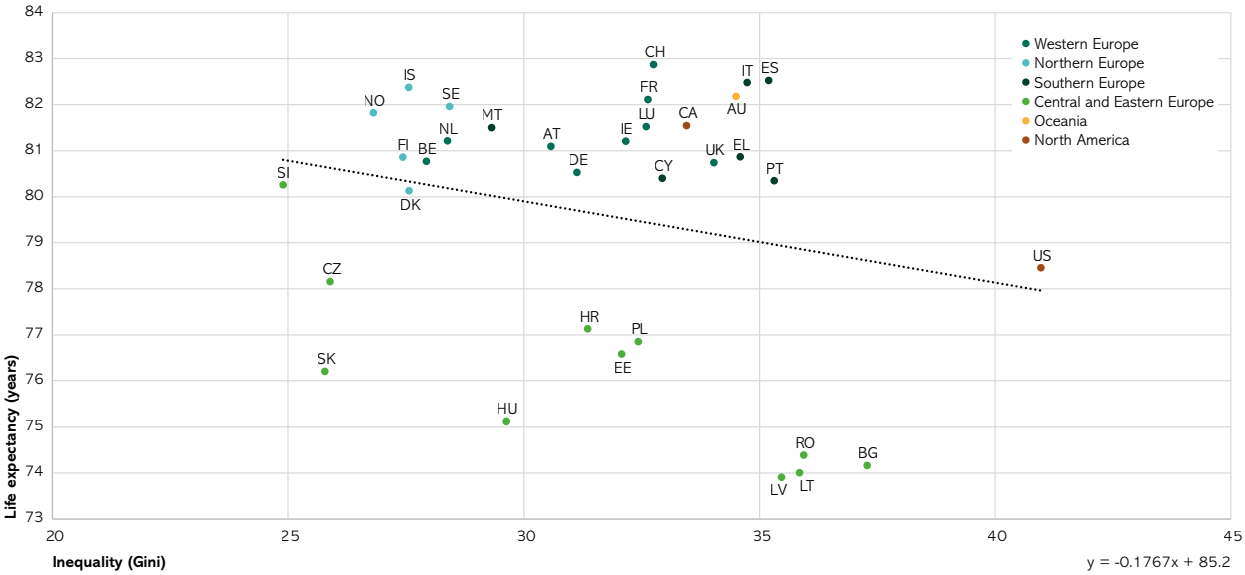


Source: author's calculation

Above, we tried to assess the impact of income growth on life expectancy, happiness and trust in government. We continue with the analysis of the correlation between inequality, on the one hand, and life expectancy, happiness and trust, at the other.

Less unequal societies tend to have, on average, higher life expectancy. The correlation is given by the trendline that follows the equation LIFE = -0.1767 Gini + 85.2, indicating that, when inequality rises by ten Gini index points, life expectancy declines by 1.7 years (see Figure 8). This finding matches with earlier similar assessments (De Vogli et al., 2005). Given the large variation of life expectancies in our sample and the usually slow change of inequality, betting on income growth seems to be the more promising way to increase life expectancy (besides many other approaches such as promoting healthier lifestyles).

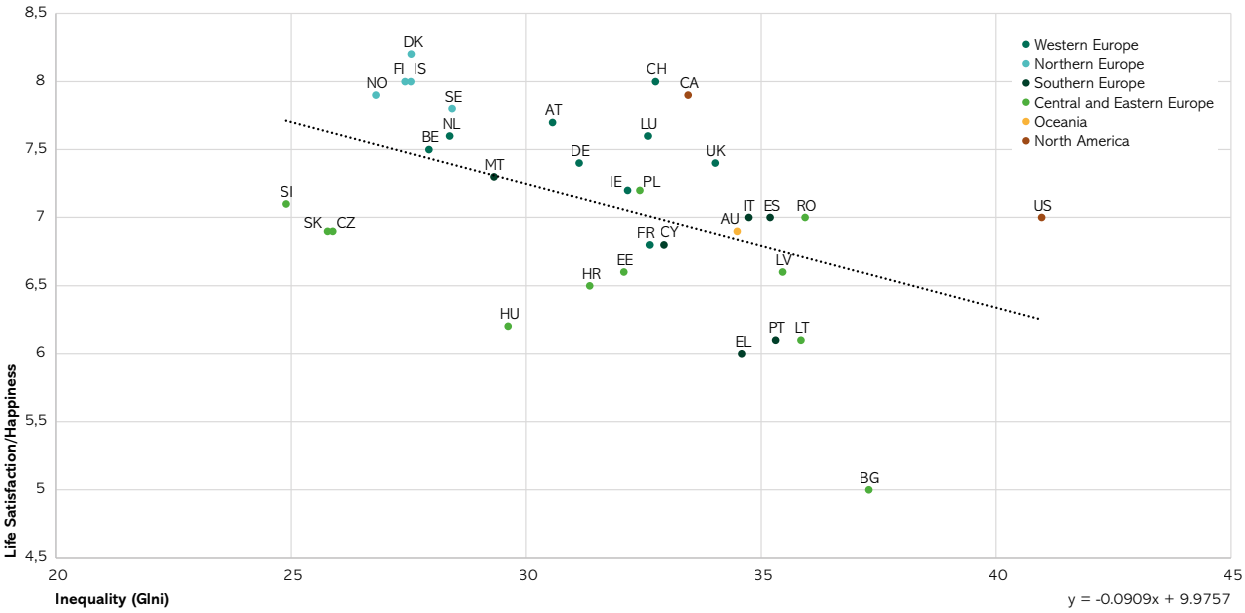
Figure 8: Correlation between inequality and life expectancy (both averages between 2007 and 2020)



Source: author's calculation

Turning to happiness, Figure 9 shows, life satisfaction declines with growing inequality (higher values of the Gini index). A ten-point rise of the Gini is, on average, accompanied by a decline of happiness by about almost four points. The trend line has the equation: Happiness = - 0.0909 Gini + 9.9757, indicating that, on average, a rise of inequality by ten Gini index points reduces the happiness score by almost one point. This result matches with the findings of Pickett and Wilkinson (2010) who posit that more equal societies are happier.

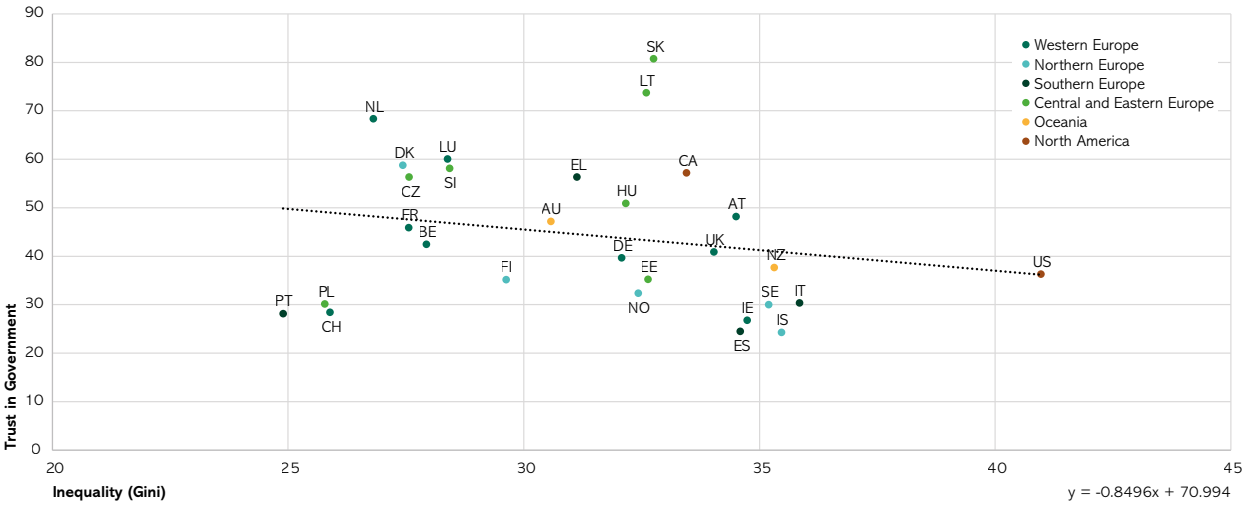
Figure 9: Inequality (Gini average 2007-2019) and life satisfaction (average 2010-2019)



Source: author's calculation

Figure 10 shows that inequality and trust in government are negatively correlated. A ten-point rise of the Gini index (= higher inequality) leads to a loss of trust by about 8.5 points. The trendline follows the equation of Trust = -0.8496 Gini + 70.994.

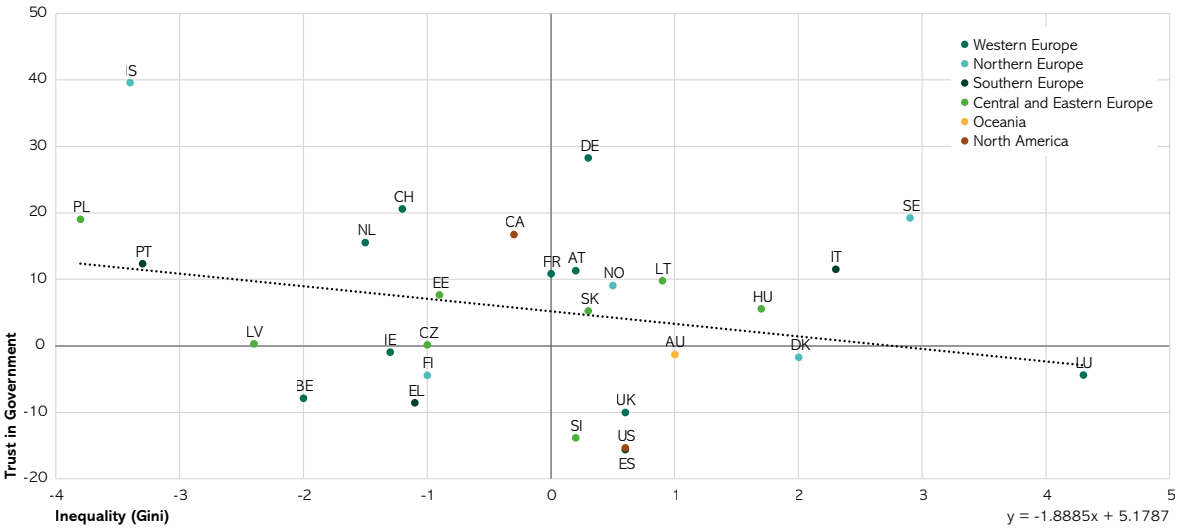
Figure 10: Inequality (Gini average 2007-2019) and Trust in government (average 2006-2021)



Source: author's calculation

A similar picture emerges when we compare the changes of inequality and trust (see Figure 11). When inequality increases (higher Gini) trust in governments tends to decline, with a rise of Gini by 1 point leading to a decline of trust by 1.9 points. The corresponding equation of the trend line is: rTrust = -1.8885 rGini + 5.1787. Both findings (Figures 10 and 11) are supported by other research, for instance by Acemoglu and Robinson (2006), Krieckhaus, J. et al. (2014) or Solt (2008).

Figure 11: Inequality (Gini change 2007-2019) and Trust in government (change 2006-2021)



Source: author's calculation

4.4. SOCIAL SECURITY

Social Security will be understood here as the protection from risks such as old age, sickness, disability, unemployment that prevent people from earning an adequate market income. Such protection can be provided by the state, public institutions like social insurance, private institutions such as private insurance companies whose use might be mandated by law or completely private means such as savings, also in the form of housing ownership, or life insurances. In this study, we will focus on government activities providing social security. Our analysis will largely follow the scheme shown in the introduction and the analysis presented in the previous study (Putnam et al. 2015).

4.4.1. Inputs: Government social spending and policies

The level and structure of social protection substantially varies from country to country. In some countries, risks are covered by the state, while the same risks in other countries are left to the private sector. Thus, social spending can be defined and delimited in various ways. Table 21 presents the total public expenditure for social protection as a percentage of GDP. Social spending includes benefits and expenditure for old age, survivors, incapacity related, family, active labour market programmes, unemployment, and housing as far as they are provided from public sources. They include cash benefits and benefits in kind. Mandatory and voluntary private spending are not included in the first six columns.

The exclusion of private mandatory spending, in particular, distorts the picture for some countries where this type of social expenditure is important. Thus, for instance, the Netherlands, Switzerland, Iceland, and Australia look "stingy" (coloured red in the first three columns) if one exclusively considers public spending. Actually, these countries spend, on average for the years 2007-19, more than four percent of GDP as a private mandatory expenditure (coloured green in the last column of Table 21, which gives the respective amounts).

In this definition, on average between 2009 and 2020, social spending makes up between low values of about 15% for Romania and high values of over 30% in France or Denmark with the average over all countries being 21.7%. As a rule, the share of social spending slowly increases when economies grow (by 0.6% percentage points per 10.000 USD additional income per person). However, some rich countries (e.g. the Netherlands, Ireland, Switzerland) have surprisingly low shares of social spending. This is due to higher shares of private social spending[18] and, to some extent, to lower levels of needs or entitlements (less unemployment explains less spending on unemployment benefits, a lower share of people above 65 years lowers expenditure on pensions).

Generally, expenditures as a share of GDP increased during the financial crisis (2009), declined afterwards and jumped significantly during the pandemic in 2020 by about three percentage points (average of all 35 countries).[19] These two rises in the share are caused by a combination of rising nominal social expenditures (by, on average, more than 10%) and the shrinking GDP in the denominator. Looking at long-term trends beyond crisis-triggered jumps, the biggest changes over the considered period (2007-2019, to exclude the exceptional rise in 2020; see sixth column of Table 21) are rises by 6.6 percentage points in Finland, 5.7 in Norway and 5.5 in Estonia, and drops by 3.9 percentage points in Ireland and 4.7 in Hungary. The decline in Ireland is exclusively due to the rise of GDP (see above Table 6) as the share of social spending in total government spending actually increased over the same period (see Table 22). The change between the two crisis years 2009 and 2020 when social spending rates were particularly high shows a similar trend (fifth column in Table 21).

[18] See https://oecdstatistics.blog/2023/02/02/sizing-up-welfare-states-how-do-oecd-countries-compare/
[19] See also Dauderstädt, 2021a.

Table 21: Social spending as a percentage of GDP (in %)

Region	Country	2007	2014	2021	Average 2009-2020	Change 2009-2020	Change 2007-2019	Private mandatory 2007-2019
Western Europe	Austria	25,5	28,3	31,1	28,1	↗	↗	0,82
Western Europe	Belgium	24,3	28,4	29,7	28,6	↗	↗	0,01
Western Europe	France	28,2	32,0	32,7	31,6	↗	↗	0,38
Western Europe	Germany	24,2	24,8	27,6	25,5	↗	↗	2,17
Western Europe	Ireland	16,7	20,1	14,2	18,6	↓	↘	0,00
Western Europe	Luxembourg	19,9	20,8	21,6	21,3	↗	↗	0,73
Western Europe	Netherlands	15,7	17,9	18,7	17,4	↗	→	6,09
Western Europe	Switzerland	14,4	15,6	18,0	16,1	↗	↗	9,59
Western Europe	United Kingdom	19,6	21,7	22,1	21,6	→	→	0,73
Northern Europe	Denmark	25,9	30,0	28,3	29,5	→	↗	2,33
Northern Europe	Finland	22,9	30,2	30,3	29,1	→	↑	0,09
Northern Europe	Iceland	15,8	17,5	22,3	18,1	↗	↗	5,89
Northern Europe	Norway	19,6	22,8	24,4	23,8	↑	↑	1,25
Northern Europe	Sweden	25,3	26,6	24,9	26,1	↘	→	0,39
Southern Europe	Cyprus		20,1	24,1	19,9	↑		
Southern Europe	Greece	20,1	25,5	26,1	25,7	↗	↗	0,56
Southern Europe	Italy	24,0	28,1	30,7	28,0	↑	↗	1,10
Southern Europe	Malta		17,8	19,8	17,4	→		
Southern Europe	Portugal	21,3	25,0	24,8	24,0	↗	↗	0,26
Southern Europe	Spain	20,9	25,4	29,5	25,5	↑	↗	0,00
Central and Eastern Europe	Bulgaria		18,4	18,7	17,1	↗		
Central and Eastern Europe	Croatia		21,5	24,1	21,4	↗		
Central and Eastern Europe	Czech Republic	17,4	20,1	22,5	19,8	↗	↗	0,46
Central and Eastern Europe	Estonia	12,4	16,0	18,4	17,3	→	↑	0,00
Central and Eastern Europe	Hungary	22,4	21,3	18,1	20,7	↘	↘	0,00
Central and Eastern Europe	Latvia	11,0	15,4	19,8	16,6	→	↑	0,00
Central and Eastern Europe	Lithuania	14,8	15,5	18,7	17,2	→	↗	0,19
Central and Eastern Europe	Poland	19,5	20,3	22,6	20,8	↗	↗	0,01
Central and Eastern Europe	Romania		14,7	17,7	15,5	↗		
Central and Eastern Europe	Slovak Republic	14,9	17,7	19,6	17,6	↗	↗	0,13
Central and Eastern Europe	Slovenia	19,8	23,1	23,7	22,8	↗	↗	0,00
Oceania	Australia	15,9	17,8	20,5	17,5	↗	↗	4,07
Northern America	Canada	16,3	16,9	24,9	18,3	↑	↗	0,00
Oceania	New Zealand	20,7	21,1	20,8	21,5	↘	↗	0,00
Northern America	United States	15,7	18,4	22,7	19,0	↑	↗	2,82
	Average	19,5	21,6	23,7	21,7	↗	↗	1,3

*Note: *figures refer to 2020. Legend: Colouring: green highest, red lowest values.*
Changes: ↑: >5; ↗:< 5 and > 1; →: >-1and <1; ↘ : >-1.
Source: OECD + Eurostat (for Bulgaria, Croatia, Cyprus, Malta, and Romania; only 2009-2020; the Eurostat values are systematically higher, by about 2%, than the OECD values as they include administrative costs) and author's calculation.

Looking at the share of social spending as percentage of total government spending, a similar picture emerges (see Table 22), albeit with certain differences. As total public spending runs at an average level of about 40% of GDP in our countries, albeit with large differences, an average share of 35% of all government spending (see last row in Table 22) leads to a share of GDP of about 14% which is clearly lower than the shares shown in Table 21.

On average for all countries, there is a rise of this share during the recession in the wake of the financial crisis after 2009. Starting in 2017, the share is declining again. Surprisingly, in 2020, the pandemic has substantially increased the share but in two countries, namely the USA (by 5.6 percentage points) and Canada (by 4.9). This might be due to a general increase of public spending, in particular on health services, during the pandemic.

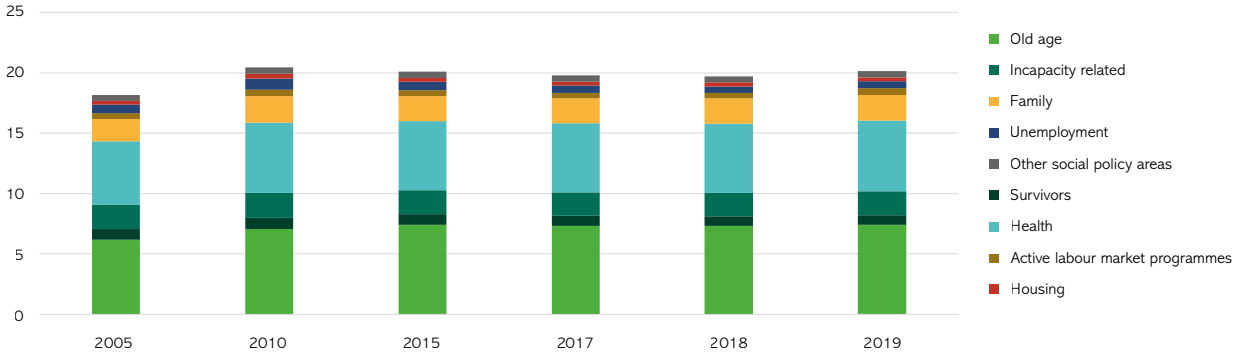
Table 22: Social spending as percentage of total government spending (in %)

Region	Country	2007	2014	2020	Average 2007-2020
Western Europe	Austria	39,46	40,96	40,14	40,77
Western Europe	Belgium	34,62	35,54	38,40	35,85
Western Europe	France	41,23	42,83	44,23	42,46
Western Europe	Germany	43,59	42,50	42,96	42,95
Western Europe	Ireland	35,92	36,15	37,41	35,49
Western Europe	Luxembourg	40,31	43,16	43,86	42,19
Western Europe	Netherlands	34,07	37,17	36,13	36,44
Western Europe	Switzerland	39,31	39,60	43,36	39,50
Western Europe	United Kingdom	34,78	37,43	31,94	35,99
Northern Europe	Denmark	43,28	43,46	41,86	43,27
Northern Europe	Finland	40,98	44,05	44,64	43,47
Northern Europe	Iceland	18,05	21,37	27,32	21,84
Northern Europe	Norway	37,03	39,36	38,12	38,87
Northern Europe	Sweden	40,60	40,51	37,77	40,04
Southern Europe	Cyprus	26,58	28,10	30,19	30,26
Southern Europe	Greece	33,41	40,18	37,73	37,45
Southern Europe	Italy	37,20	41,53	44,11	40,90
Southern Europe	Malta	32,55	31,54	26,18	31,17
Southern Europe	Portugal	33,69	36,77	38,19	37,03
Southern Europe	Spain	33,23	39,76	42,72	38,73
Central and Eastern Europe	Bulgaria	26,84	30,84	31,42	32,96
Central and Eastern Europe	Croatia	29,48	31,38	28,75	30,60
Central and Eastern Europe	Czech Republic	29,90	31,48	30,50	30,93
Central and Eastern Europe	Estonia	26,76	30,45	32,78	31,50
Central and Eastern Europe	Hungary	34,50	30,58	26,39	31,71
Central and Eastern Europe	Latvia	22,91	29,41	31,30	29,35
Central and Eastern Europe	Lithuania	32,63	36,19	37,99	36,25
Central and Eastern Europe	Poland	36,36	37,56	37,31	37,39
Central and Eastern Europe	Romania	26,78	32,23	32,72	32,37
Central and Eastern Europe	Slovak Republic	35,63	34,60	35,70	35,09
Central and Eastern Europe	Slovenia	37,37	36,88	36,44	37,41
Oceania	Australia	28,12	27,52	26,10	27,32
Northern America	Canada	28,16	29,15	34,79	29,64
Oceania	New Zealand		30,32	26,77	30,54
Northern America	United States	17,93	20,38	25,45	20,41
	Average	33,49	35,17	35,48	35,11

Legend: Colouring: green highest, red lowest values.
Source: https://datafinder.qog.gu.se/variable/gfs_sp and author's calculation.

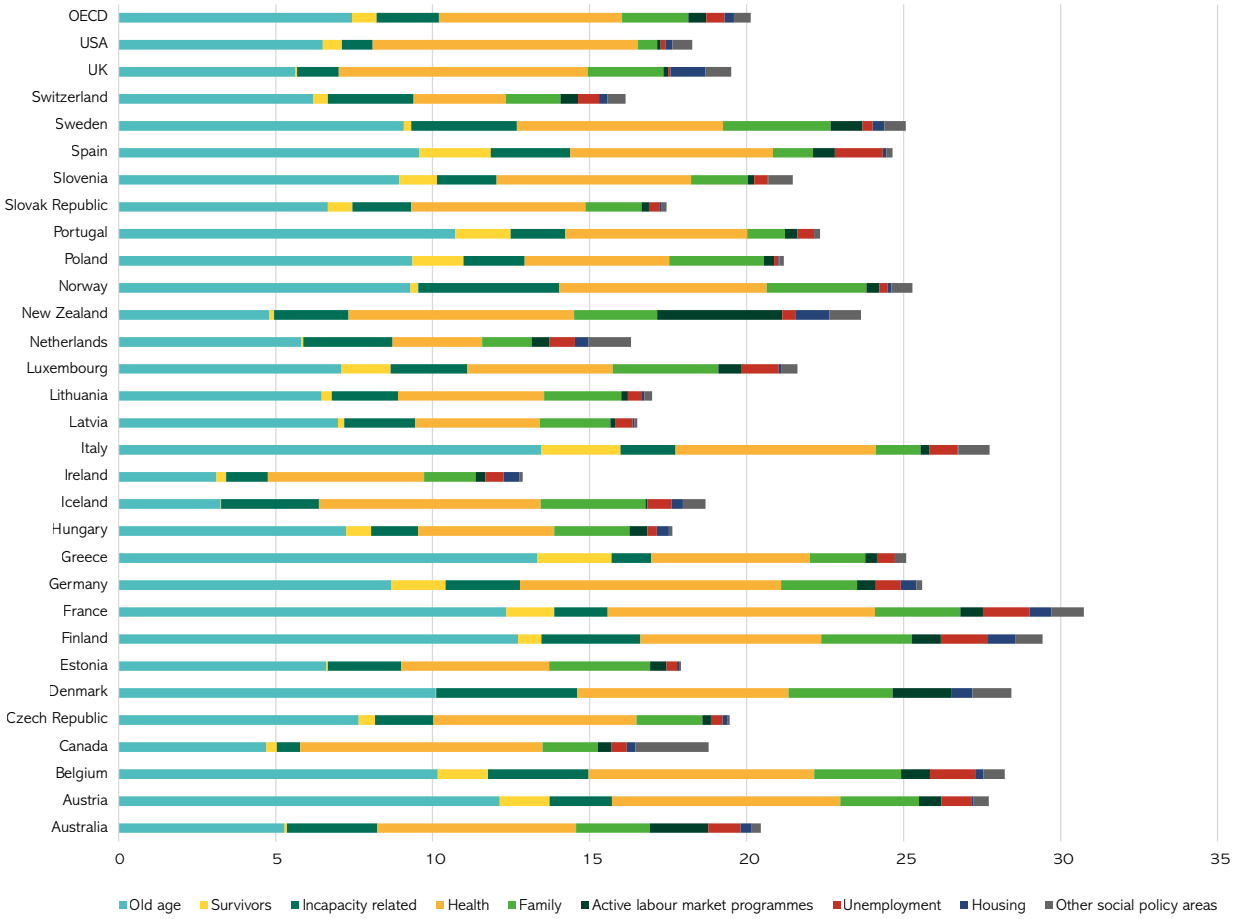
The composition of social spending did not change much since 2005. Spending on old age and survivors made up the bulk of social spending (around 40%) and its share increased by two percentage points, with health being the second most important branch with about 29%, a share that hardly changed. Incapacity- and unemployment-related spending declined by 1.5 and 1.2 percentage points, respectively, this being the relatively largest reductions of shares in total social spending, probably due to declining levels of unemployment since 2013 (see Table 14).

Figure 12A: Changing structure of social spending (in % of GDP)



Source: OECD

Figure 12B: Social spending by type (in percent of GDP) in 2019



Source: OECD

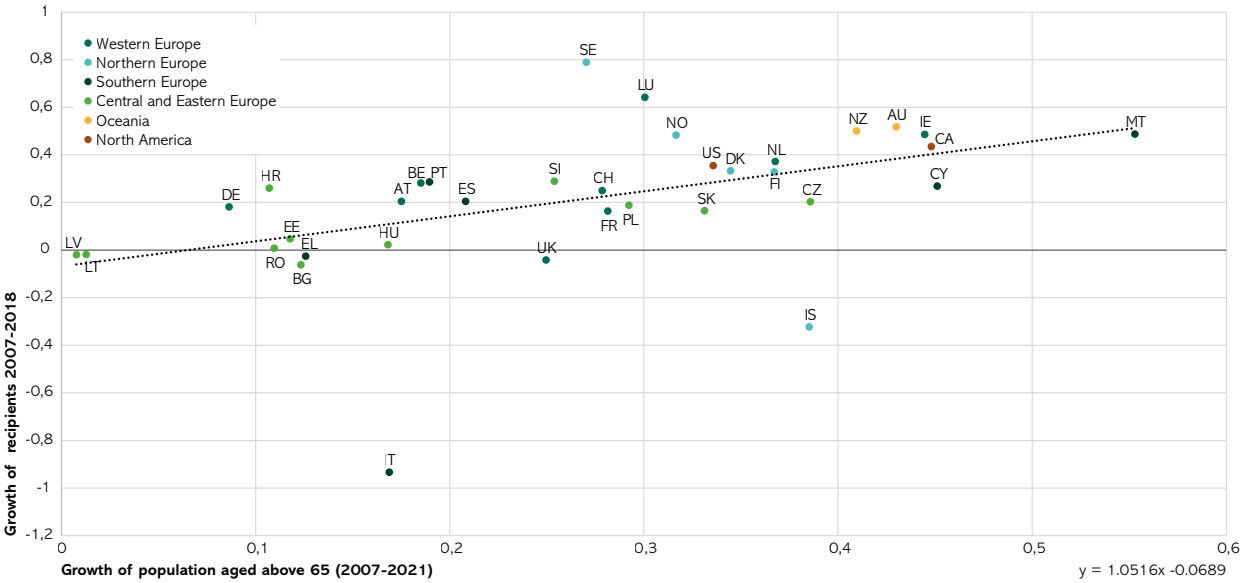
The composition of social expenditure (in 2019) varies from country to country (see Figure 12B), but, as a rule, it is similar to the OECD average (Figure 12A) in so far as spending on old age (40.9% of all social spending in the OECD) and, to a somewhat lesser extent, health (29.1%) are the two biggest items. Greece spends the highest share (62.6%) on old age and survivors. Other countries with shares above 50% are Italy (57%), Portugal (55.9%) and Poland (51.2%). Iceland has the smallest share (17.9%) followed by New Zealand, Australia, Canada and Ireland (all less than 27%). Regarding health, the relatively biggest spenders are the USA, Canada and the UK (all above 40%) while Finland, the Netherlands and Switzerland spend less than 20%.

In the other branches of social spending, you find also peculiarities and national or regional specific patterns: Spending on families, which in the OECD average makes up over 10% of total spending, is much lower in the Southern periphery of the EU with values of less than 6% in Spain, Italy, Portugal and 7% in Greece. Spending on unemployment benefits (1.7% in the OECD average) is relatively highest in Spain (6.2%), followed by Luxembourg, Finland, Austria and Australia with shares above 5%. UK and USA are the most frugal in this respect, spending less than 1%. Australia and New Zealand spend more than 9% on active labour market programmes while the OECD average is 2.8%.

4.4.2. Output: Transfer beneficiaries

The amounts of transfers received from public social expenditure correspond to the amounts spent (minus administrative costs, see Table 28), basically equalizing input and output. Thus, we instead focus on the number of people protected and the level of protection. Assessing the most important component of social protection, pensions and other means to provide income in old age, we compare the demographic change with the change in the number of recipients. As, at least in some countries, many people receive transfers from different sources, there appear more recipients than people in the respective statistics. The OECD data table[20] for recipients of social benefits has, alone for old age, over 130 different types of insurances, resulting in many different systems per country covering different professional groups and types of pensions. For instance, Canada has two major systems each covering more people than persons older than 65 years. Thus, comparing growth rates provides a better picture of the changing size of coverage. In most countries, the growing number of people above 65 is accompanied by a similar rise in the number of recipients (as indicated by the trend line in Figure 13). We see that some rich countries overcompensate the demographic change (Sweden, Luxemburg, Norway) and some show changes clearly below the trend line, such as Italy, Iceland and the UK.

Figure 13: Change of recipients and old age people (2007-2018)



Source: author's calculation

Table 24 provides an overview of the replacement levels that show which percentage of the former income pensioners can expect to receive. The pensions presented here include all mandatory pension schemes for private-sector workers, regardless of whether they are public or private. Pensions are based on prior income and decrease proportionately the higher the former salaries were above the average wage (AW). The size of the decline is an indicator of the progressive character of the respective pension system. The most progressive countries are Denmark, Czechia, and Ireland, the least progressive are the many countries that have flat replacement rates over all income groups: Bulgaria, Cyprus, Finland, Hungary, Italy, Latvia, and Romania. Women are treated worse than men in Hungary, Australia and Romania.

[20] The total table has over 730 columns for different sources and types of social spending.

Table 24: Pension entitlements; gross pension replacement rate (different income levels; multiples of average wage = AW) in % (Year of labour market entry: 2020)

Region	Country	Pension entitlements 2018					
		Male 0.50 of AW	Male 1.00 of AW	Male 1.50 of AW	Female 0.50 of AW	Female 1.00 of AW	Female 1.50 of AW
Western Europe	Austria	74,1	74,1	57,3	74,1	74,1	57,3
Western Europe	Belgium	67,5	43,4	29,2	67,5	43,4	29,2
Western Europe	France	60,2	60,2	51,9	60,2	60,2	51,9
Western Europe	Germany	46,5	41,5	33	46,5	41,5	33
Western Europe	Ireland	59,4	29,7	14,9	59,4	29,7	14,9
Western Europe	Luxembourg	90,4	76,6	69,7	90,4	76,6	69,7
Western Europe	Netherlands	73,1	69,7	68	73,1	69,7	68
Western Europe	Switzerland	53,1	44,1	23	52,5	43,5	22,7
Western Europe	United Kingdom	70,6	49	38,2	70,6	49	38,2
Northern Europe	Denmark	125,1	80	61,3	125,1	80	61,3
Northern Europe	Finland	56,6	56,6	56,6	56,6	56,6	56,6
Northern Europe	Iceland	72,9	51,8	51,8	72,9	51,8	51,8
Northern Europe	Norway	60,6	46	28,9	60,6	46	28,9
Northern Europe	Sweden	61,4	53,3	67,2	61,4	53,3	67,2
Southern Europe	Cyprus	64,5	64,5	64,5	64,5	64,5	64,5
Southern Europe	Greece	84,7	72,6	66,5	84,7	72,6	66,5
Southern Europe	Italy	74,6	74,6	74,6	74,6	74,6	74,6
Southern Europe	Malta	59,1	57,6	47,2	59,1	57,6	47,2
Southern Europe	Portugal	76,3	74,9	72,5	76,3	74,9	72,5
Southern Europe	Spain	73,9	73,9	67	73,9	73,9	67
Central and Eastern Europe	Bulgaria	57,3	57,3	57,3	57,3	57,3	57,3
Central and Eastern Europe	Croatia	57	38	38	57	38	38
Central and Eastern Europe	Czech Republic	81,2	49	32,9	81,2	49	32,9
Central and Eastern Europe	Estonia	47,7	28	18,2	47,7	28	18,2
Central and Eastern Europe	Hungary	62,5	62,5	62,5	58,1	58,1	58,1
Central and Eastern Europe	Latvia	43,4	43,4	43,4	43,4	43,4	43,4
Central and Eastern Europe	Lithuania	31,5	19,7	13,8	31,5	19,7	13,8
Central and Eastern Europe	Poland	31,8	30,6	30	31,9	23,4	22,8
Central and Eastern Europe	Romania	40,6	40,6	40,6	38	38	38
Central and Eastern Europe	Slovak Republic	62,6	53,1	46,7	62,6	53,1	46,7
Central and Eastern Europe	Slovenia	62,3	42	41,4	62,3	42	41,4
Oceania	Australia	62,7	31,3	31,3	59,8	28,4	28,4
Northern America	Canada	53,2	38,8	22,3	53,2	38,8	22,3
Oceania	New Zealand	65,9	39,8	19,9	65,9	39,8	19,9
Northern America	United States	49,6	39,2	27,9	49,6	39,2	27,9
	Average	63,3	51,6	44,8	63,0	51,1	44,3

Legend: Colouring: green highest, red lowest values.
Source: OECD.

Table 25 gives an overview over the level of protection against various risks.
Across all countries, the levels are generally high, averaging around 90%, except for the unemployed, with an average value of only 54%. The vulnerable population and individuals affected by work injuries similarly exhibit lower averages. Certain countries however, notably Cyprus, fare worse in comparison (refer to the last column in Table 25, presenting the overall average for all risks with available data). Germany, France, and Austria emerge as top performers, while, as a trend, individuals in the Western and Northern regions of Europe tend to enjoy greater protection compared to those in the South and East.

However, the protection levels shown in Table 25 represent just the percentage of people covered and not the level of protection. For instance, achieving full coverage may be accompanied by a low level of actual benefits. Some values given by the ILO are surprising, to say the least. In particular, the coverage of unemployed varies enormously between countries that have rather similar welfare state arrangements (Germany 100% vs. France 47.5% or Denmark 100% vs. Sweden 60.2%).[21]

Table 25: Levels of protection against different risks (percentage of persons covered)

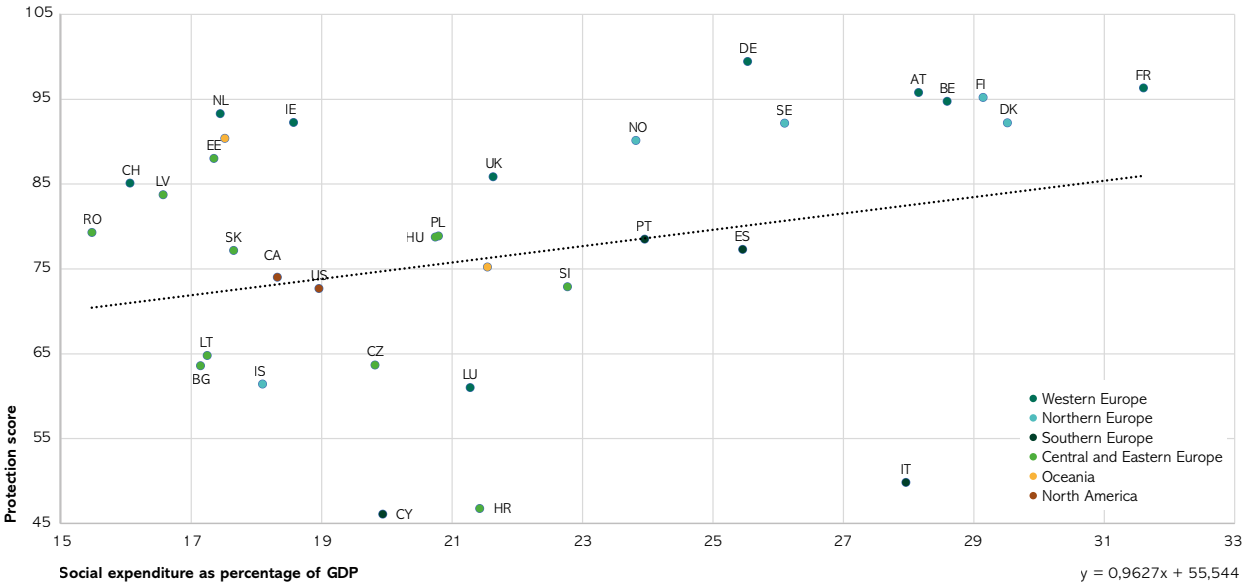
Region	Country	Disability 2018	Child/family cash benefits 2018	Pension 2018	One social protection 2018	Unemployment 2018	Poor 2016	Vulnerable 2018	Work injury 2019	Score
Western Europe	Austria	100	100	100	100	100	100	93	77,4	95,8
Western Europe	Belgium	100	100	100	100	100	100	100	63,1	94,7
Western Europe	France	100	100	100	100	47,5	100	100	74,1	88,8
Western Europe	Germany	100	100	100	100	100	100	96	100	99,4
Western Europe	Ireland	91,4	100	100	89,9	100	100	73,8	71,8	91,0
Western Europe	Luxembourg	60	100	100	100	49,8			77,1	55,3
Western Europe	Netherlands		100	100	97,2	74,8	100	90,3	97,6	80,4
Western Europe	Switzerland	96,9	100	100	96,6	62	100	70,2	66,7	85,1
Western Europe	United Kingdom	100	100	100	92,1	56,4	100	76,6	68	85,9
Northern Europe	Denmark	100	100	100	93,2	100	100	63,7	88	93,1
Northern Europe	Finland	100	100	100	100	44,2	100	100	66,5	87,2
Northern Europe	Iceland	100	63,4	71,4	85,3	100			95,1	61,4
Northern Europe	Norway	100	100	100	98,8	58,2	100	83,1	89,6	90,1
Northern Europe	Sweden	100	100	100	100	60,2	100	100	84,8	92,1
Southern Europe	Cyprus	22,6	60,3		59,5	17,8	100	24,1		32,1
Southern Europe	Greece	100		95,8	63,8	26,4			46,9	38,4
Southern Europe	Italy	100		94,4	85,7	48,2		42,6	72,2	51,1
Southern Europe	Malta	100		100		49,7			73,5	46,2
Southern Europe	Portugal	89	93,1	90,4	92,6	40,2	100	59,3	100	81,7
Southern Europe	Spain	77,3	100	98,2	82,6	44,2	100	45		66,4
Central and Eastern Europe	Bulgaria	68	48,6	94	84,7	35,4	52,1	28,1	86,8	59,0
Central and Eastern Europe	Croatia	100	47	89,8	75	62			68	52,4
Central and Eastern Europe	Czech Republic	100	10,8	91,3	86,8	45,7	99,6	32	66,2	63,7
Central and Eastern Europe	Estonia	100	100	100	94,8	93,7	100	91,7	76,8	94,6
Central and Eastern Europe	Hungary	100	100	90,5	90	26,3	100	56	78,3	78,7
Central and Eastern Europe	Latvia	100	100	92	96,1	40	100	85	69,2	83,7
Central and Eastern Europe	Lithuania	100	100	97,1	100	37,7	54,1		64,7	64,8
Central and Eastern Europe	Poland	100	100	83,6	88	16,5	100	52	100	78,9
Central and Eastern Europe	Romania	100	100	93,5	92,9	15,8	100	82,6	77,3	81,3
Central and Eastern Europe	Slovak Republic	100	100	90,6	95,5	13	100	70	63,1	76,7
Central and Eastern Europe	Slovenia	100		100	94,8	29,7	100	100	66,4	70,9
Oceania	Australia	100	100	100	100	60,5	100	100	72	90,4
Northern America	Canada	100	39,7	100	100	41,2	100	100	69,1	78,6
Oceania	New Zealand	82	67,1	100	100	65	37,4	100	100	78,8
Northern America	United States	100	100	100	83,8	28,3	64,5	31	84,8	72,7
	Average	93,7	88,1	96,3	91,8	54,0	93,4	74,0	77,4	75,5

Legend: Colouring: green highest, red lowest values.
*Note: All data for 2018 except 2019 for column "work injury" and 2016 for column "poor", and some countries where the figures carry an * or §: § 2011; §§ 2015; §§§ 2016;* 2017;** 2019; *** 2020.*
Source ILO and author's calculation.

[21] Upon request, ILO did not deliver an explanation.

When examining inputs (such as social expenditure as a percentage of GDP from Table 21) alongside outputs (average scores reflecting the level of protection from the last column of Table 25), a weak correlation is observed (depicted in Figure 14). Specifically, a ten-percentage point increase in social spending results in an average rise of 4.6 percentage points in the proportion of people deemed protected.

Figure 14: Social expenditure (average share of GDP) and share of protected people



Source: author's calculation

4.4.3. Outcome: Poverty, levels of protection

In the end, social policies including tax policies and labour market regulation should prevent poverty and correct unfavourable market outcomes. How far this correction goes can be assessed by comparing the income distribution before and after taxes and transfers. The respective indicators are the Gini index of market income (see Table 26) and the Gini index of disposable income (see Table 11). Across all countries, the average Gini index of market income exhibited little change between 2007 and 2019. Notable changes were observed in some countries with the largest increase in Bulgaria, Finland, Greece, Spain and Switzerland and marked decreases in Hungary, Poland, Slovak Republic and Romania (see last column in Table 26).

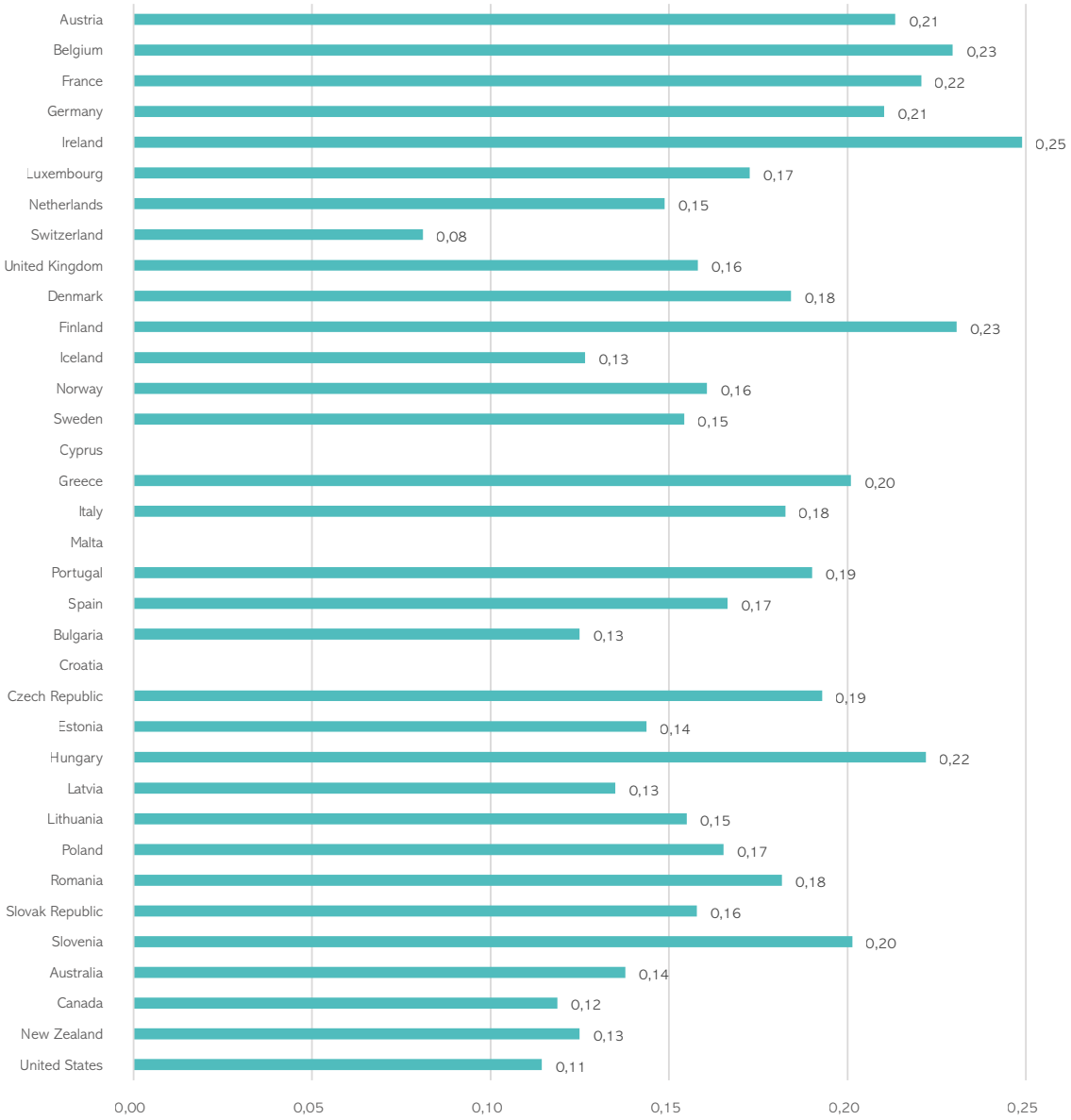
Table 26: Distribution of market income (Gini coefficient)

Region	Country	2007	2013	2019	Change 2007-2019
Western Europe	Austria	0,49	0,50	0,49	→
Western Europe	Belgium	..	..	0,49	
Western Europe	France	..	0,50	0,52	↗
Western Europe	Germany	0,49	0,51	0,50	↗
Western Europe	Ireland	0,51	0,57	..	↑
Western Europe	Luxembourg	..	..	0,49	
Western Europe	Netherlands	..	0,44	0,46	↗
Western Europe	Switzerland	0,37	0,39	0,40	↑
Western Europe	United Kingdom	0,52	0,53	0,51	↘
Northern Europe	Denmark	..	0,44	0,45	↗
Northern Europe	Finland	0,48	0,50	0,51	↑
Northern Europe	Iceland	0,38	0,38	..	→
Northern Europe	Norway	..	0,41	0,43	↗
Northern Europe	Sweden	..	0,42	0,43	↗
Southern Europe	Cyprus				
Southern Europe	Greece	0,50	0,55	0,53	↑
Southern Europe	Italy	0,49	0,51	..	↗
Southern Europe	Malta				
Southern Europe	Portugal	0,52	0,55	0,51	↘
Southern Europe	Spain	0,45	0,52	0,49	↑
Central and Eastern Europe	Bulgaria	0,49	0,49	0,52	↑
Central and Eastern Europe	Croatia				
Central and Eastern Europe	Czech Republic	0,45	0,46	0,43	↘
Central and Eastern Europe	Estonia	..	0,51	0,47	↓
Central and Eastern Europe	Hungary	0,51	0,52	0,46	↓
Central and Eastern Europe	Latvia	0,47	0,50	0,47	→
Central and Eastern Europe	Lithuania	0,47	0,51	0,50	↑
Central and Eastern Europe	Poland	0,48	0,46	..	↘
Central and Eastern Europe	Romania	0,54	0,54	0,51	↓
Central and Eastern Europe	Slovak Republic	0,42	0,43	0,38	↓
Central and Eastern Europe	Slovenia	0,42	0,46	0,44	↗
Oceania	Australia		0,46	0,45	↘
Northern America	Canada	0,43	0,43	0,42	↘
Oceania	New Zealand	..	..	0,45	
Northern America	United States	..	0,51	0,51	→
	Average	0,47	0,48	0,47	

*Note: * 2012; **2018; ***2008.*
Legend: Colouring: green lowest, red highest values.
Change: ↑: rise by more or equal 0.03; ↗: rise by less than 0.03; →: no change; ↘: decline by less than 0.03; ↓: decline by more or equal 0.03.
Source: OECD and author's calculation.

Given the relative stability of the income distribution of both, disposable and market income over the period considered (and due to the lack of data for several years in many countries), we compared the average (2007-2019, as far as available) Gini of market and disposable income. The difference indicates how strongly government policies redistributed income through tax, social and regulatory policies. As depicted in Figure 15, Switzerland engaged in minimal redistribution, whereas Ireland significantly reduced the Gini index of market income by 0.25, nearly halving its initial value. Notable states demonstrating relatively strong redistribution (exceeding 0.2) include Belgium, Finland, Hungary, France, Austria, and Germany.

Figure 15: Redistribution effort
(difference of Gini coefficients of market and disposable income on average between 2007 and 2019)



Source: OECD and author's calculations

Reducing poverty is one of the most important goals of economic and social policy and lies at the score of the main subject of this chapter, namely social security. Poverty rates (see Table 27) substantially vary between countries around an average rate of 15%. The rates are at their lowest (below 10%) in Iceland, Denmark, the Netherlands and Norway. The worst performers are Bulgaria, Croatia, Latvia and Romania with rates above or close to 30%.
Looking at the changes over time, the record, on average for all countries, is rather dismal as the rate increased by almost four percentage points (see last row in Table 27). There were two brief periods of declining poverty in 2009/10 and 2020 during the two crises when governments responded with compensatory policies. But these

drops were but transitory and followed by rises that eventually increased poverty to new heights. Between 2007 and 2021, poverty increased strongly in Latvia and Hungary (by more than ten percentage points), followed closely by Sweden (9.3) and Slovakia (8.7). Significant reductions could be only achieved in Cyprus (-9.3) while the other improving countries managed to lower the poverty rates by less than three percentage points.

The rise of poverty might be surprising given the relatively good income growth performance of the economies considered here (see Table 8 and 16, and Table 14 for wealth growth). However, the average growth of income increases the median income too. When the incomes of the relatively poorest part of the population grow less than the average (or median) incomes, their share of the total population is bound to increase. The contrary effect occurs during recessions when the median income declines (and governments react to the crisis by expanding income support).

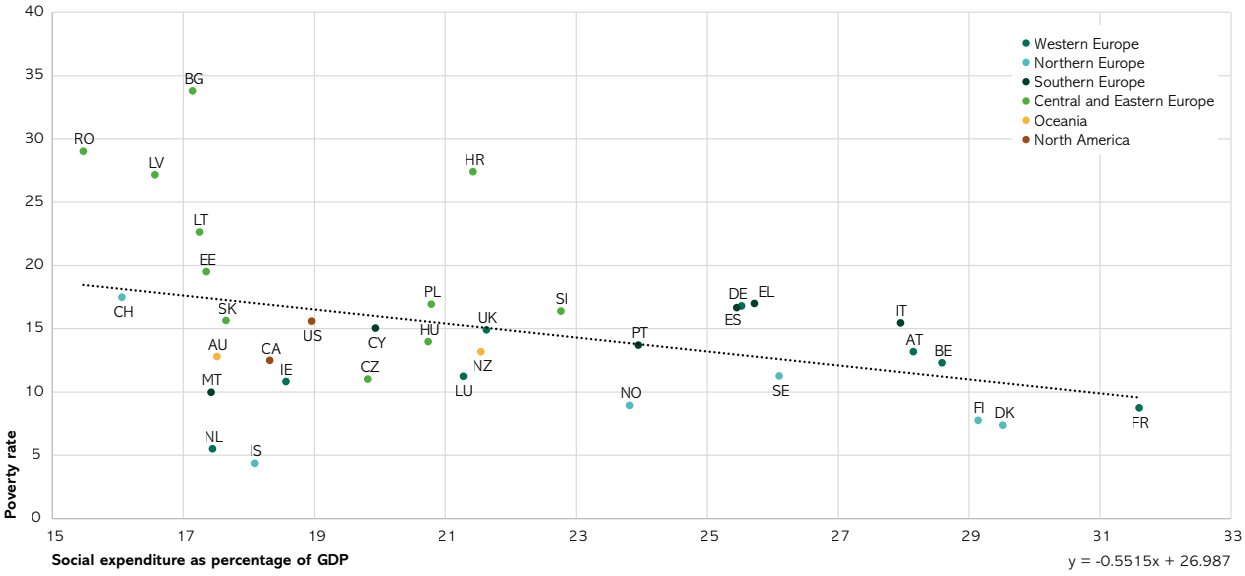
Table 27: Poverty rate (income less than 50% of median income) in percent

Region	Country	2007	2014	2021	Average 2007-2021	Change 2007-2021
Western Europe	Austria	9,0	13,4	14,9	13,2	
Western Europe	Belgium	11,0	13,6	10,6	12,3	
Western Europe	France	8,9	9,0	10,7	8,7	
Western Europe	Germany	15,3	18,4	17,9	16,8	
Western Europe	Ireland	12,1	11,5	12,0	10,8	
Western Europe	Luxembourg	9,7	10,8	14,4	11,2	
Western Europe	Netherlands	4,5	4,5	9,5	5,5	
Western Europe	Switzerland	14,4	16,6	18,4	17,5	
Western Europe	United Kingdom	19,0	12,6	:	14,9	
Northern Europe	Denmark	6,4	5,8	8,2	7,4	
Northern Europe	Finland	7,5	6,8	6,2	7,7	
Northern Europe	Iceland	5,0	3,3	:	4,4	
Northern Europe	Norway	8,3	8,5	10,2	8,9	
Northern Europe	Sweden	6,2	10,5	15,5	11,3	
Southern Europe	Cyprus	20,3	13,9	11,0	15,0	
Southern Europe	Greece	17,8	18,4	17,0	17,0	
Southern Europe	Italy	15,1	14,7	16,5	15,4	
Southern Europe	Malta	8,9	9,4	11,8	10,0	
Southern Europe	Portugal	11,7	16,0	15,8	13,7	
Southern Europe	Spain	14,3	18,5	18,5	16,6	
Central and Eastern Europe	Bulgaria	29,4	31,7	35,3	33,8	
Central and Eastern Europe	Croatia	:	24,1	31,8	27,4	
Central and Eastern Europe	Czech Republic	9,7	10,5	11,6	11,0	
Central and Eastern Europe	Estonia	17,3	18,2	19,4	19,5	
Central and Eastern Europe	Hungary	10,8	18,4	21,1	14,0	
Central and Eastern Europe	Latvia	24,6	21,6	35,0	27,1	
Central and Eastern Europe	Lithuania	19,9	17,7	25,0	22,6	
Central and Eastern Europe	Poland	14,1	17,3	17,2	16,9	
Central and Eastern Europe	Romania	30,2	29,6	36,4	29,0	
Central and Eastern Europe	Slovak Republic	11,7	17,3	20,4	15,6	
Central and Eastern Europe	Slovenia	14,0	17,6	14,2	16,4	
Oceania	Australia		12,8		12,8	
Northern America	Canada	12,9	12,6		12,5	
Oceania	New Zealand	14,2	7,7	12,4	13,2	
Northern America	United States		10,5	15,1	15,6	
	Average	13,6	14,4	17,5	15,0	

Legend: Colouring: green lowest, red highest values.
Source: Eurostat except Australia, Canada, New Zealand and USA (taken from OECD) and author's calculation; values are substantially lower according to OECD than to Eurostat, probably due to different income concepts used (Eurostat is using equivalized disposable income, OECD disposable income. As equivalized income per capita is higher, the poverty threshold of 50 or 60 percent of the median income is higher, too.).

How can governments reduce the poverty rate? Comparing social spending and the poverty rate (both average 2007-2021) shows (see Figure 16) that more social spending is likely to reduce poverty, but only to some extent. Increasing the share of social spending by ten percentage points of GDP lowers, on average, the poverty rate by 5.5 percentage points. The relatively weak impact of social spending on poverty is probably due to the fact that, to some extent, most social protection systems protect former income levels rather than equalizing incomes. The levels of most pensions, unemployment or sickness benefits are linked to former incomes, usually wages, thus "protecting" income disparities.

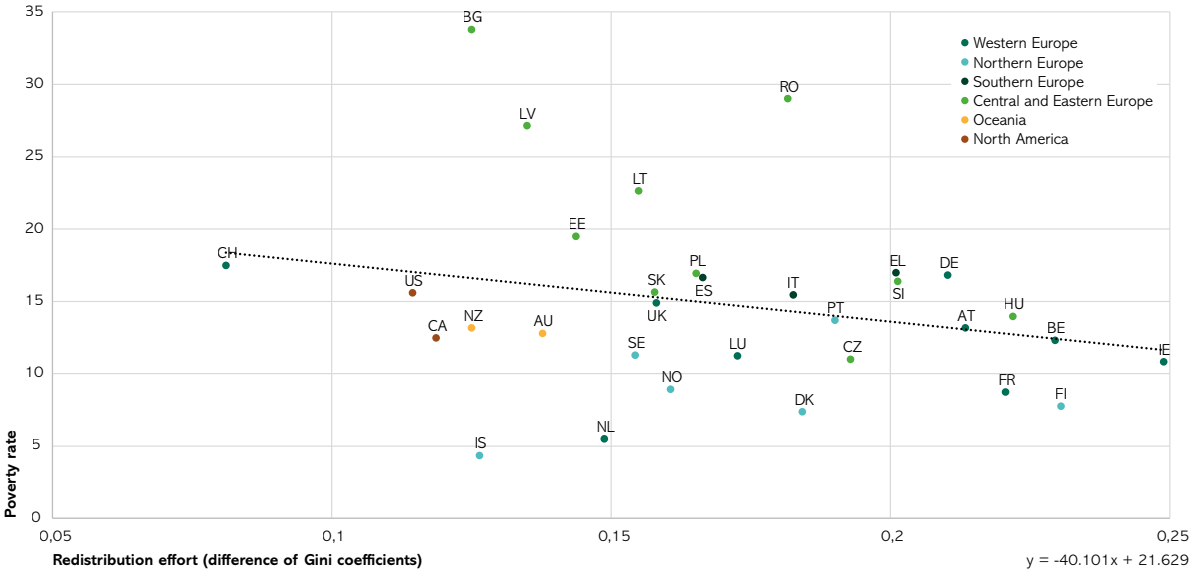
Figure 16: Social expenditure and poverty



Source: author's calculation

Redistributing income through taxes and social transfers reduces poverty too. The relationship is less clear as reducing the inequality (Gini coefficient), by 0.1 lowers the poverty rate by 4 percentage points (see Figure 17).

Figure 17: Redistribution (difference of Gini values for market and disposable income) and poverty rate (average 2007-2021)



Source: author's calculation

How efficiently did the countries implement social policy? In order to answer that question, we compared the administrative costs with the total expenditure. Table 28 gives an overview. The share of administrative costs is, on average, below 3%[22] and has declined by half a percentage point since 2007. The least efficient countries (considering the whole time period) are the Netherlands and Switzerland whose high share might reflect low levels of total social spending (see Table 21) rather than high administrative costs; the most efficient ones are Iceland and Malta. Most countries improved their performance, above all the Netherlands, Slovakia and Finland. In several others, the share of administrative costs increased, notably in Romania.

Table 28: Share of administrative costs in social spending (in%)

Region	Country	2007	2014	2020	Average 2007-2020	Change 2007-2020
Western Europe	Austria	2,2%	2,0%	1,6%	2,0%	↘
Western Europe	Belgium	3,4%	3,2%	3,6%	3,4%	↗
Western Europe	France	4,8%	4,4%	4,5%	4,4%	↘
Western Europe	Germany	3,8%	4,0%	3,7%	4,0%	→
Western Europe	Ireland	4,7%	4,1%	3,5%	4,0%	↓
Western Europe	Luxembourg	1,6%	1,5%	1,3%	1,5%	↘
Western Europe	Netherlands	7,9%	7,2%	5,5%	6,7%	↓
Western Europe	Switzerland	5,7%	5,8%	5,4%	5,7%	↘
Western Europe	United Kingdom	1,5%	0,9%		1,1%	↓
Northern Europe	Denmark	3,2%	4,2%	4,1%	4,0%	↗
Northern Europe	Finland	3,2%	2,6%	1,6%	2,4%	↓
Northern Europe	Iceland	1,2%	0,8%	0,7%	0,9%	↘
Northern Europe	Norway	2,1%	1,9%	1,7%	1,9%	↘
Northern Europe	Sweden	2,1%	2,0%	1,9%	2,0%	↘
Southern Europe	Cyprus	1,5%	1,1%	0,9%	1,3%	↘
Southern Europe	Greece	1,9%	1,6%	0,9%	1,4%	↘
Southern Europe	Italy	2,8%	2,3%	2,0%	2,4%	↘
Southern Europe	Malta	1,1%	1,0%	0,8%	1,0%	↘
Southern Europe	Portugal	2,2%	1,5%	1,5%	1,6%	↘
Southern Europe	Spain	2,2%	1,8%	1,6%	1,9%	↘
Central and Eastern Europe	Bulgaria	2,6%	2,0%	2,3%	2,2%	↘
Central and Eastern Europe	Croatia		1,8%	1,6%	1,9%	↑
Central and Eastern Europe	Czech Republic	3,3%	3,0%	2,9%	3,1%	↘
Central and Eastern Europe	Estonia	1,2%	1,2%	1,7%	1,3%	↗
Central and Eastern Europe	Hungary	1,9%	1,3%	2,0%	1,6%	→
Central and Eastern Europe	Latvia	1,8%	1,4%	1,4%	1,5%	↘
Central and Eastern Europe	Lithuania	2,8%	3,0%	2,2%	2,8%	↘
Central and Eastern Europe	Poland	2,7%	2,2%	1,7%	2,3%	↘
Central and Eastern Europe	Romania	2,7%	2,1%	4,4%	1,9%	↑
Central and Eastern Europe	Slovak Republic	4,0%	2,7%	2,3%	2,8%	↓
Central and Eastern Europe	Slovenia	2,1%	1,6%	1,3%	1,7%	↘
Oceania	Australia					
Northern America	Canada					
Oceania	New Zealand					
Northern America	United States					
	Average	2,8%	2,5%	2,4%	2,5%	

Legend: Colouring: green lowest, red highest values.
Changes: ↑: >1; ↗: < 1 and > 0.1; →: >-0.1and <0.1; ↘: >-0.1.
Source: Eurostat and author's calculations.

[22] That finding fits the same proposition by Lindert (2021, 187).

However, saving on administrative costs may not be the best way to achieve a higher degree of social protection. Administrative effort might lead to a more precise targeting of spending, for instance by more means testing. In the debate about a general (unconditional) basic income, proponents support their position arguing often that forgoing means testing will save high amounts of money. In fact, a study conducted by Stefan (2015) indicated a positive correlation between high administrative costs and the extent of poverty reduction. The study identified outliers, with Greece being a notable example. Despite incurring high administrative costs, Greece experienced a much lower reduction in the poverty rate (by only 15.2%), compared to the UK, which achieved a reduction of approximately 46% with an equivalent per capita expenditure on administration.

In order to get a better picture, we compared different studies on the efficiency of social spending. Unfortunately, these studies only covered EU countries (also depending on the date as some countries joined the EU later or, in the case of the UK, left the EU). The first statistical analysis (Hermann et al., 2008) critically evaluated an official EU assessment (European Commission, 2007) and calculated an efficiency score for EU member states (Table 29, first column). A more recent study by Antonelli and De Bonis (2019) focused more on families and calculated different scores for input and output efficiency (values shown in Table 29, second column). The paper by Cyrek (2019) subsequently analysed the impact of social spending (including spending on health and education) on poverty and income inequality (see Table 29, third column). The most recent paper on the subject, by Kutwa and Sawulski (2022) covered all current EU member states. Its findings are shown in the last column of Table 29 (the values are mostly estimated from a graph).

Table 29: Efficiency of social expenditures in the EU

Time of data		2006	2015	2016	2003-2019
Region	Country	Efficiency of social expenditures (Hermann et al.)	Output efficiency (Antonelli and De Bonis)	Efficiency in poverty reduction (Cyrek)	Efficiency of spending on social-welfare policies (Kutwa and Sawulski)*
Western Europe	Belgium	-0,76	0,91	0,527	0,75
Western Europe	France	0	0,99	0,518	0,98
Western Europe	Germany	0,84	0,74	0,524	0,37
Western Europe	Ireland	1,55	0,56	1	0,71
Western Europe	Luxembourg	1,55	0,83	0,752	0,97
Western Europe	Netherlands	2,75	1	0,544	0,95
Western Europe	Switzerland				
Western Europe	United Kingdom	-2,92	0,74	0,584	
Western Europe	Denmark	2,03	1	0,584	0,97
Northern Europe	Finland	2,69	0,69	0,755	0,99
Northern Europe	Iceland				
Northern Europe	Norway				
Northern Europe	Sweden	1,76	0,96	0,619	0,41
Southern Europe	Cyprus	0,37		1	0,72
Southern Europe	Greece	-6,1	1	0,307	0,32
Southern Europe	Italy	-5,62	0,44	0,347	0,25
Southern Europe	Malta	2,18		0,532	0,48
Southern Europe	Portugal	-2,91	1	0,389	0,41
Southern Europe	Spain	-3,91	0,49	0,403	0,59
Central and Eastern Europe	Bulgaria			0,354	0,36
Central and Eastern Europe	Croatia				0,73
Central and Eastern Europe	Czech Republic	5,9	0,51	0,625	0,94
Central and Eastern Europe	Estonia	0,76	0,61	0,438	0,58
Central and Eastern Europe	Hungary	1,86	0,3	0,839	0,33
Central and Eastern Europe	Latvia	-3,28	0,84	0,508	0,38
Central and Eastern Europe	Lithuania	-0,7	0,85	0,369	0,39
Central and Eastern Europe	Poland	-1,25	0,38	0,482	0,83
Central and Eastern Europe	Romania	-1,17		0,334	0,38
Central and Eastern Europe	Slovak Republic	3,93	0,91	0,516	1
Central and Eastern Europe	Slovenia	3,11	0,82	0,61	0,9

Legend: Colouring: green highest, red lowest values.
**The values are taken mostly taken from the chart 1 by Kutwa and Sawulski (2022); the figures provided are an estimate whilst the graph includes a range of values with upper and lower confidence intervals.*
Source: (Hermann et al., 2008; Antonelli and De Bonis, 2019; Cyrek, 2019; Kutwa and Sawulski, 2022)

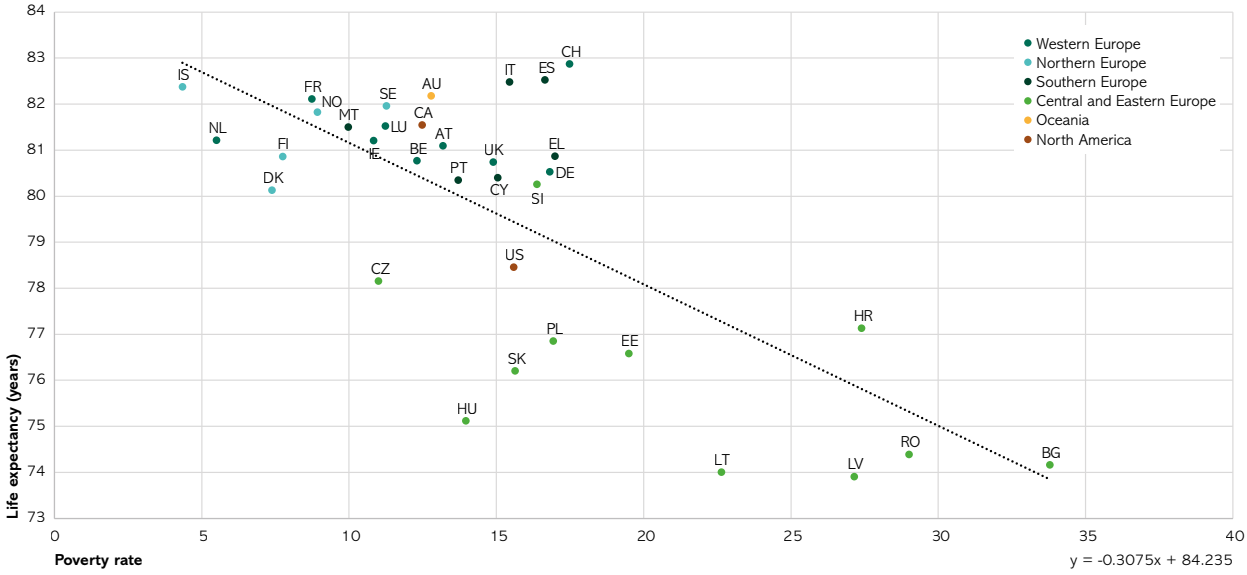
Following the findings of Hermann et al. (2008), the most efficient governments are identified as the Czech Republic and, to smaller degree, Slovakia, Slovenia, the Netherlands, Finland and Denmark. On the other hand, the least efficient countries included Greece, Italy, Spain and Portugal. In terms of efficiency, the EU's Southern periphery has once again exhibited poor performance. In this case, however, the EU's austerity policies are not to blame as the findings refer to the time before the financial crisis.

Contrary to earlier findings, a more recent study by Antonelli and De Bonis (2019) indicated that Portugal and Greece, along with Denmark and the Netherlands, are among the top performers in terms of efficiency, while Czech Republic scored poorly. It is noteworthy how these results differed from the findings of Hermann et al. (2008). According to Cyrek (2019), the highest scores go to Ireland and Cyprus, with Greece receiving the lowest ranking. Notably, Cyrek's study revealed that expenditure on social protection has a lesser impact compared to spending on health and education. In the latest analysis by Kutwa and Sawulski (2022), Slovakia ranked top, followed by Finland and France, while Greece and Italy occupied the two lowest places in the rankings. . If we try to produce an average score from the four studies, Slovakia scored the best and Bulgaria worst, though covered only by the most recent study. The Mediterranean countries are relatively bad performers, whereas the Netherlands and Denmark ranked among the topfive, together with Czech Republic and Slovenia.

4.4.4. Trust and satisfaction

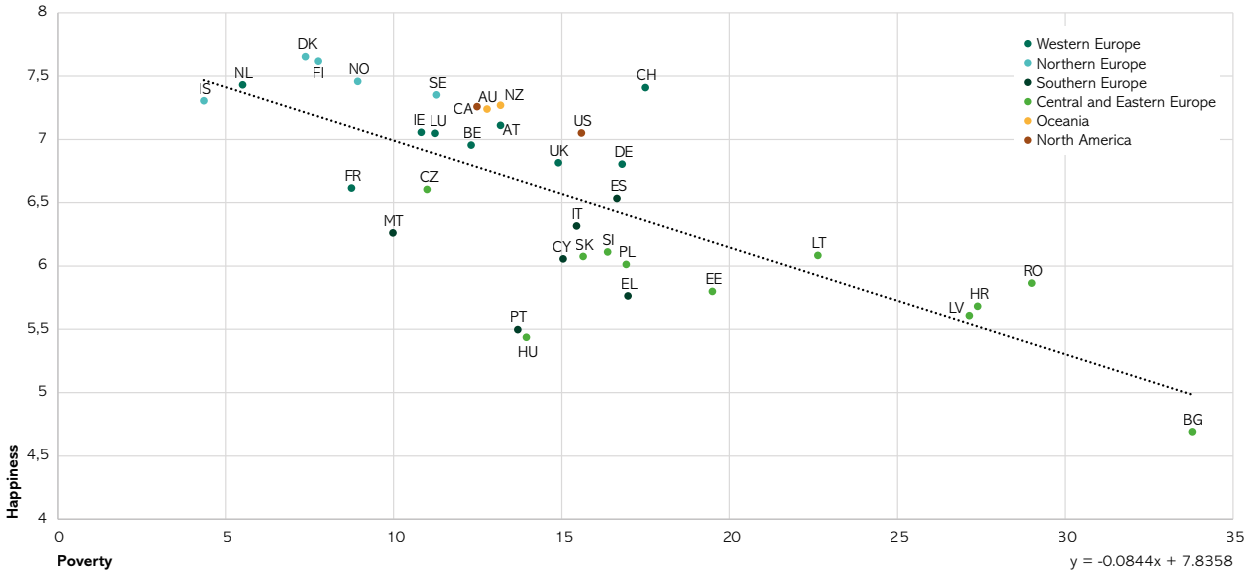
In this subsection, we analyse how social policies influenced life expectancy, happiness and trust in government. We start with the intervening variable, the poverty rate, which can be influenced by social policies to some degree (see Figures 16 and 17). As Figure 18 shows, higher poverty rates correlate with lower life expectancy. Both life expectancy and poverty, are represented by their averages over the time period under consideration. A poverty rate that is one percentage point higher lowers the life expectancy by about four months (or ten percentage points more lead to a decline by three years). A similar picture emerged when we compared poverty rates and degrees of happiness or life satisfaction or with trust in government which both tend to decline strongly with higher poverty rates (see Figure 19 and 20).

Figure 18: Poverty and Life expectancy



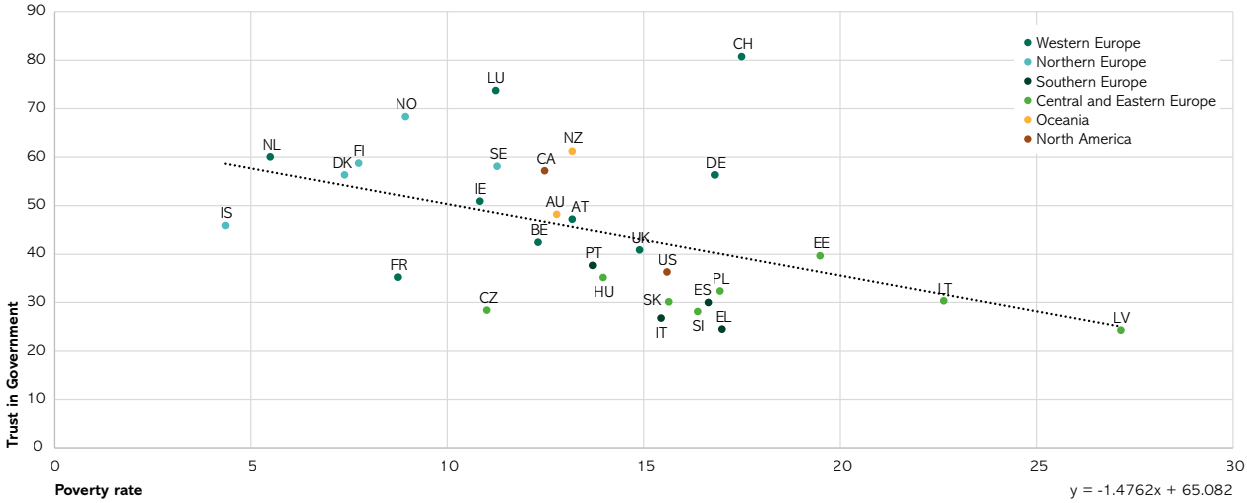
Source: author's calculation

Figure 19: Poverty and Happiness/Life satisfaction



Source: author's calculation

Figure 20: Poverty and trust in government



Source: author's calculation

While the correlation between poverty and life expectancy, life satisfaction and trust in government is relatively strong, the correlation with the level of social expenditure is much weaker (and thus not presented here). This, possibly surprising result may be due to the fact that large parts of social expenditure, in particular pensions and, to a lesser extent, income support at times of sickness or unemployment, do not so much relieve poverty but try to maintain unequal income levels achieved before (as mentioned above). Furthermore, we did not include spending on health and education in our analysis as there are separate chapters dedicated to these policy areas. If these social policies are included in the wider sense, the assessment produces results that show social spending in a much better light (Lindert, 2021).

Lindert's main findings are:

1. High-spending welfare states do not suffer from weak GDP growth or rising unemployment and have longer life expectancy, less poverty, less inequality of income, cleaner governments, lower budget deficits and happier populations (Lindert, 2021, p.172-174).

2. Welfare states depend largely on VAT and "sin taxes" and do not "soak the rich". Generous universal systems are more efficient (lower administrative costs) (Lindert 2021, p. 207).

3. Government policies have led to progressive redistribution (from rich to poor) mainly through targeted spending rather than progressive taxation. Rising inequality since the 1970s results more from higher inequality of market income than from weaker redistribution through more regressive public policies (Lindert 2021, p.209).

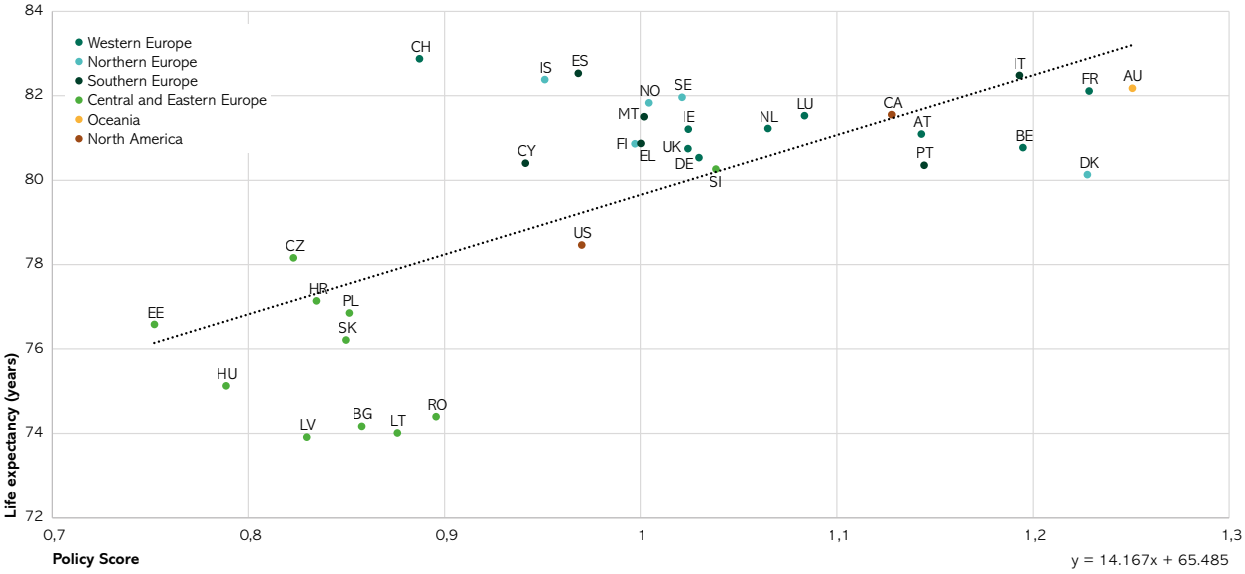
If we compare Lindert's main findings with this study they are compatible or complement each other while Lindert covers more countries over a longer period using a wider definition of social security including education, health and housing. Looking at the first point, the Scandinavian countries prove Lindert's point as can be seen in Figures 16, 18, 19, 20, and Table 1 (budget deficit). Point two is a mixed case, as the strong welfare states rank not among the countries with highest share of taxes on goods and services and the lowest of taxes on income and wealth (see Tables 3 and 4). However, in terms of efficiency, they are among the top performers (see Table 29). Regarding point three, our study does not offer a clear support to Lindert's point because of the different and shorter time period. Between 2007 and 2021 (the period considered here) neither policies nor levels of inequality changed substantially.

4.5. GENERAL EVALUATION AND CONCLUSION

To sum up, we created a composite score of government policies that includes the share of income tax of total tax revenue (Table 3), the top income tax rate (Table 5), the minimum wage (Table 6), the strictness of employment protection legislation (Table 7), and the share of social spending in GDP (Table 21). To produce a consistent indicator, we divided the value of the indicator for each country by the average for all countries. For countries with no data (e.g. no values for minimum wages in Scandinavian countries) we assume average values as zero would unrealistically suggest no changes at all. This normalised values for all five indicators are summed up and divided by five. We call the result the (government) policy score. Due to the described normalisation method, its values range between 0.7 and 1.3 (average = 1), with the CEE countries showing very low scores. The following figures show how that score relates to our three final goals life expectancy, happiness and trust in government.

Generally, the correlations are positive, but there is a visible dispersion of country cases that indicate that the specific conditions of each country are likely to be more relevant than the average size of a set of policies. The relationship is strongest with regard to life expectancy which increases by 1.4 years by each 0.1 increase in the score (Figure 21).

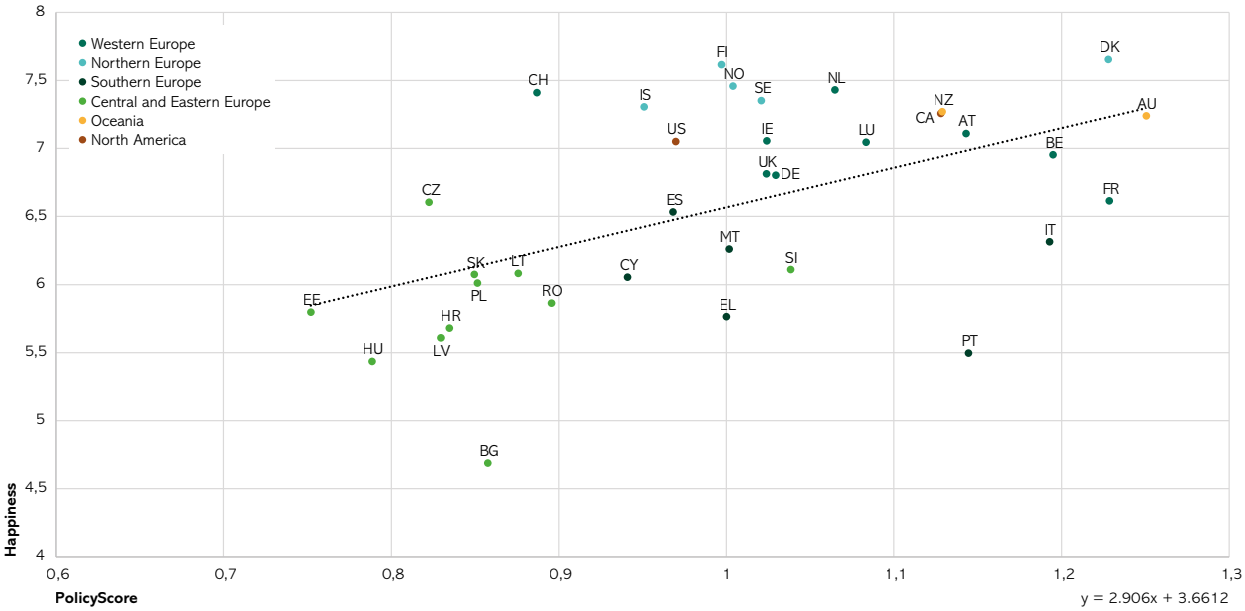
Figure 21: Policy score and life expectancy



Source: author's calculation

Turning to life satisfaction/happiness, the correlation becomes weaker, though still positive. On average, a rise of the policy score by 0.1 increases the happiness score by almost 0.3 (see Figure 22).

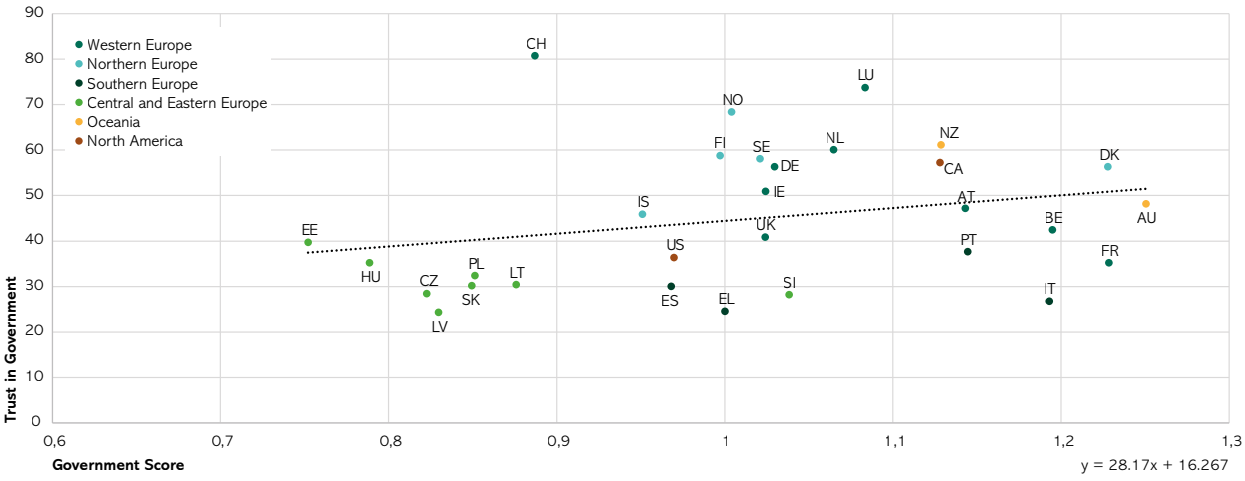
Figure 22: Policy score and life satisfaction/happiness



Source: author's calculation

The weakest, but still positive correlation can be observed between the score and the trust in government. A rise in the policy score by 0.1 points increase the trust value by 0.28 points (see Figure 23).

Figure 23: Policy score and trust in government

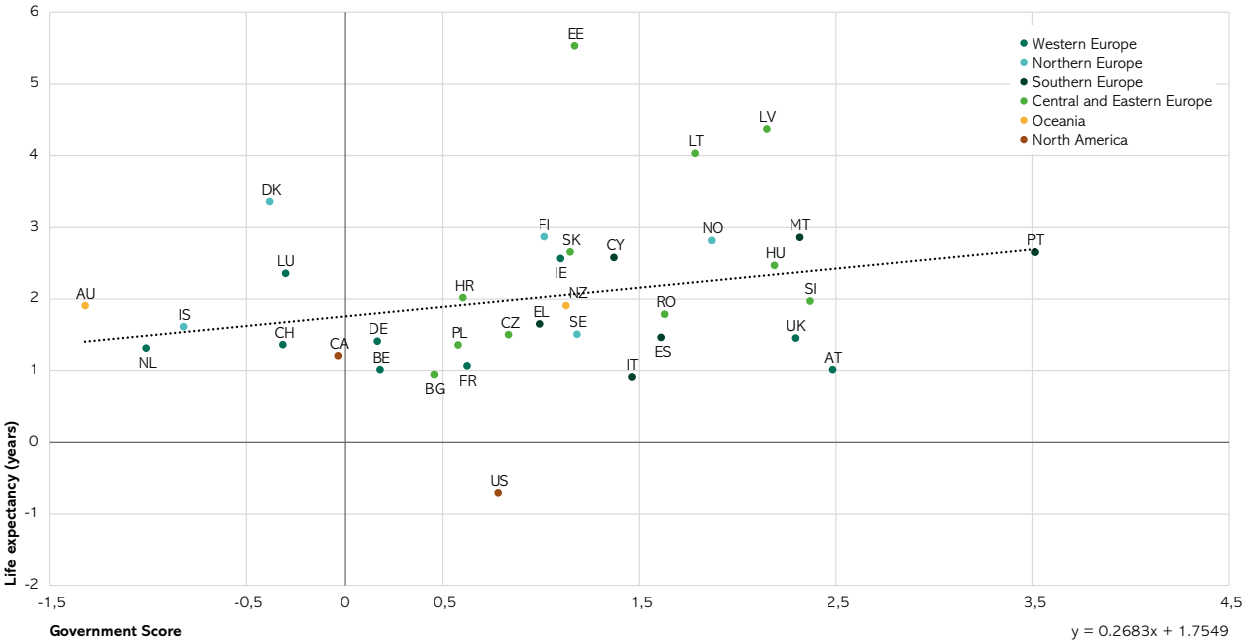


Source: author's calculation

Instead of comparing average values (over the time period under consideration), we can try to assess the impact of changes in government policies on changes in the goal variables (life expectancy, happiness, trust). For this purpose, we calculate normalised values of the changes in the above-chosen set of five policies. The resulting correlations with the change rates of life expectancy, happiness, trust in government can be seen in Figures 24-26. The correlations are generally weaker than for the averages (Figures 21-23), probably because policies did not change strongly.

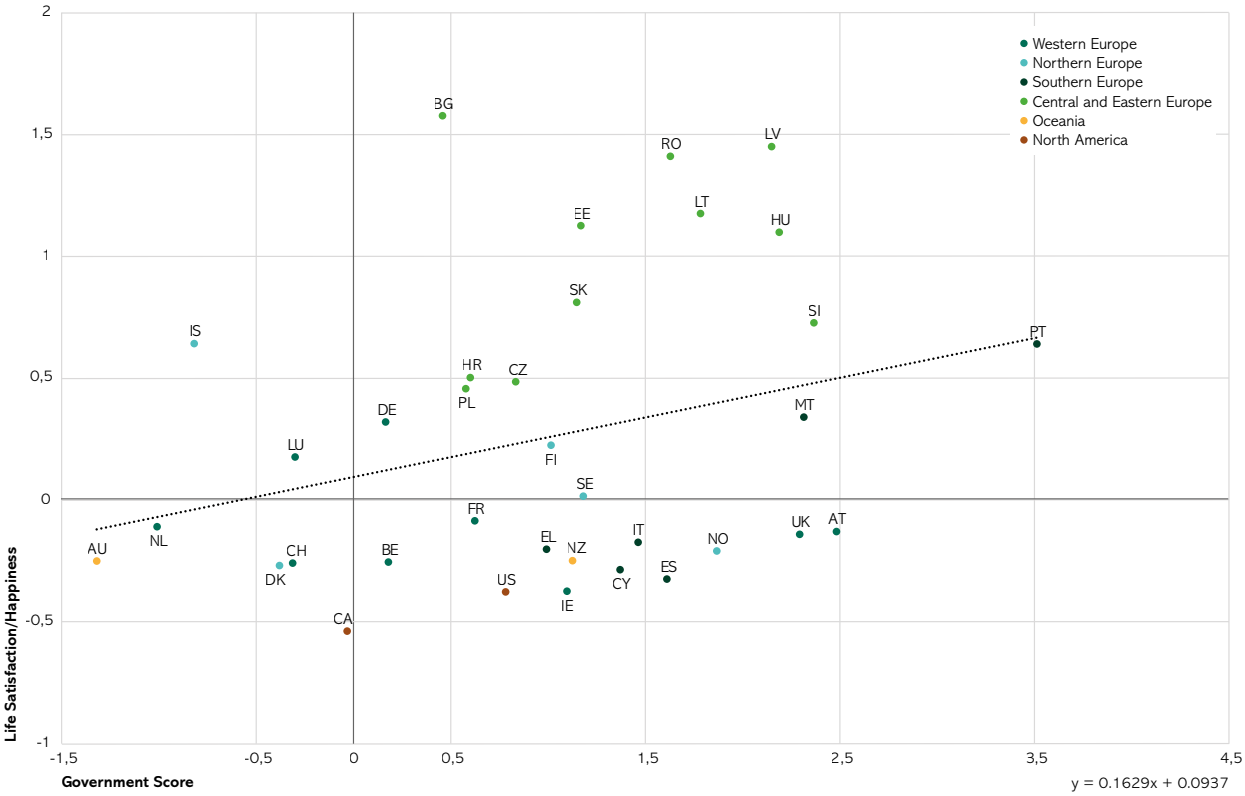
Regarding the goal of trust in government, the correlation is even negative. This strange finding probably is driven to a large extent by the outliers Iceland and Germany, which both had large increases in trust without large positive changes in the policies under consideration. Other studies have found that active/generous welfare states increase trust in government (Kumlin and Haugsgjerd, 2017).

Figure 24: Change of policy score and change of life expectancy



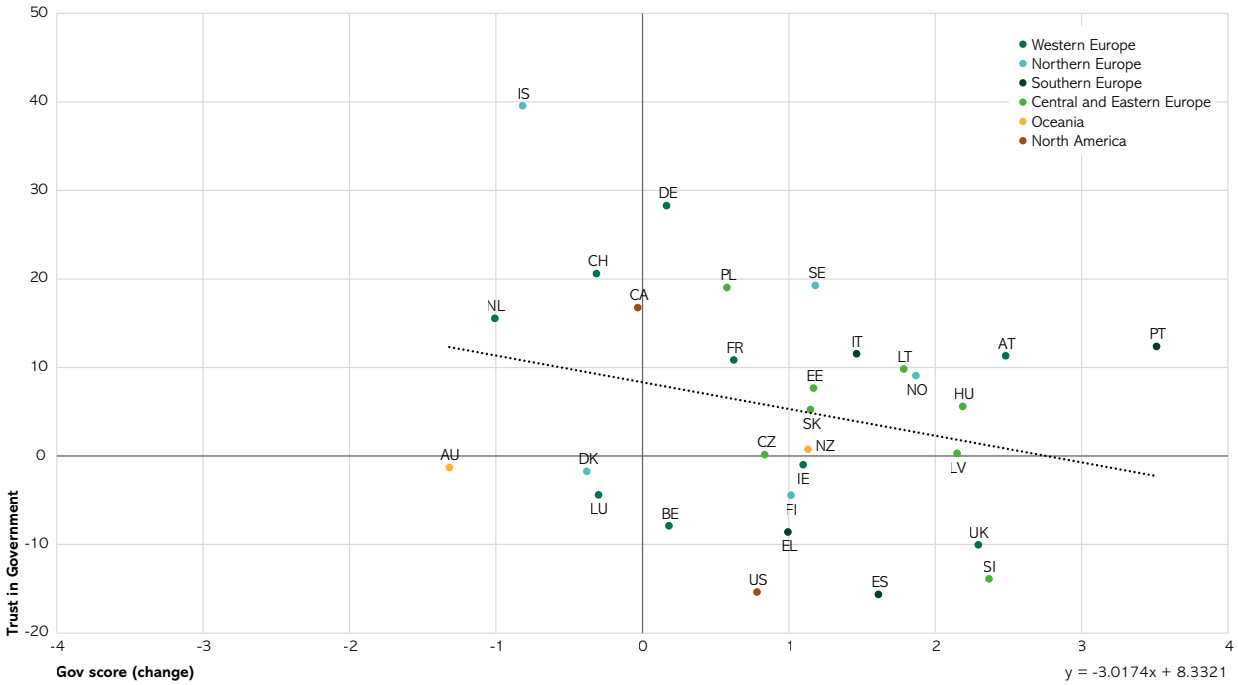
Source: author's calculation

Figure 25: Change of policy score and changes of happiness



Source: author's calculation

Figure 26: Change in policy score and trust in government



Source: author's calculation

To conclude, the statistical correlations indicate that the policies included in our policy score and adopted by governments tend to increase the values of the indicators that are supposed to measure the goals which matter to the governments and citizens. However, as the scatter plots show, there is always a substantial dispersion with outliers that provide exceptions to the statistical "rule".

Thus, we add to the correlation analysis an assessment of countries. For this purpose, we created three composite scores, one economic, one representing our three final goals (life expectancy, happiness and trust) and one "total score" combining the previous two. The economic score also consists of three components: average GDP/cap growth (see Table 8), changes of unemployment (see Table 14) and inequality (Gini; see Table 11). All values are normalised in the same way as we used for the policy score (see Figure 26). Table 30 shows the results.

To check our findings, we compared them with two other indices, the Social Progress Index (SPI) and the Human Development Index (HDI). The SPI is based on a much bigger set of indicators resulting from a huge effort of data gathering.[23] The respective column in Table 30 gives the changes of this index between 2014 and 2022 (except Luxembourg and Malta). The results are often close to our findings, but the Mediterranean countries scored much better as the SPI does not include our economic indicators but a much broader set of indicators for basic human needs, well-being and opportunities (rights). The only common indicator of that and our set is life expectancy. The HDI is composed of three indicators (income, life expectancy, education), two of them (except education) being elements of our score, too. Thus, the HDI scores tend to confirm our findings, albeit with some exceptions: Canada, Italy, Luxembourg, Norway and Spain scoring clearly better; Germany, Lithuania and Slovakia worse. The differences probably result from different scores regarding education (beyond the scope of this chapter and the subject of another chapter of this EIPA study).

[23] See https://www.socialprogress.org/; the index includes many features that are not in the scope of this chapter as the related outcomes are resulting from government policies in other fields such as education, health, housing, law and justice. See Porter, M. et al., 2014, Green, M. et al., 2019 and 2022.

Table 30: Country performance (change during our period)

Region	Country	EcoScore	3 Goals Score	Total Score	SocPro	HDI
Western Europe	Austria	0,73	0,71	0,71	3,60	0,14
Western Europe	Belgium	0,69	-0,66	-0,32	4,39	0,25
Western Europe	France	0,17	0,74	0,60	5,22	0,16
Western Europe	Germany	1,17	2,42	2,11	4,68	0,19
Western Europe	Ireland	2,90	-0,12	0,63	3,03	0,13
Western Europe	Luxembourg	0,40	0,35	0,36	-0,18	0,58
Western Europe	Netherlands	1,02	1,05	1,04	2,47	0,15
Western Europe	Switzerland	0,93	1,17	1,11	2,29	0,19
Western Europe	United Kingdom	0,41	-0,57	-0,32	1,45	0,17
Northern Europe	Denmark	0,81	0,10	0,28	3,91	0,30
Northern Europe	Finland	0,42	0,49	0,47	3,71	0,27
Northern Europe	Iceland	1,00	1,44	1,33	1,92	0,40
Northern Europe	Norway	0,92	0,76	0,80	2,38	0,37
Northern Europe	Sweden	0,83	1,47	1,31	1,36	0,36
Southern Europe	Cyprus	1,00	0,39	0,54	5,73	0,20
Southern Europe	Greece	-2,43	-0,53	-1,00	8,41	0,20
Southern Europe	Italy	-0,67	0,65	0,32	7,85	0,42
Southern Europe	Malta	2,65	0,91	1,35	1,89	0,24
Southern Europe	Portugal	2,00	1,61	1,70	2,84	0,16
Southern Europe	Spain	-1,51	-1,16	-1,25	4,18	0,38
Central and Eastern Europe	Bulgaria	2,00	2,54	2,41	6,62	0,25
Central and Eastern Europe	Croatia	0,88	0,99	0,96	9,02	0,41
Central and Eastern Europe	Czech Republic	1,82	0,89	1,12	4,60	0,34
Central and Eastern Europe	Estonia	1,64	2,86	2,55	5,67	0,29
Central and Eastern Europe	Hungary	1,66	2,19	2,06	3,41	0,56
Central and Eastern Europe	Latvia	1,37	2,63	2,32	8,34	0,35
Central and Eastern Europe	Lithuania	2,60	2,81	2,76	9,71	0,18
Central and Eastern Europe	Poland	3,06	2,01	2,27	2,19	0,40
Central and Eastern Europe	Romania	2,93	2,13	2,33	8,52	0,29
Central and Eastern Europe	Slovak Republic	1,92	1,83	1,85	2,84	0,09
Central and Eastern Europe	Slovenia	2,00	1,61	1,71	2,57	0,28
Oceania	Australia	0,96	-0,09	0,17	1,41	0,27
Northern America	Canada	0,34	0,54	0,49	1,28	0,40
Oceania	New Zealand	2,00	0,32	0,74	0,18	0,19
Northern America	United States	0,65	-1,57	-1,01	1,80	0,10
	Average	1,12	0,94	0,99	3,98	0,28

*Note: * Change between 2014 and 2022; for Luxembourg and Malta: 2019-2022; averages for our three scores are always 1 due to the normalization. ** Human Development Index (HDI) Change 2010-2021.*
Source: author's calculation; SPI: Porter, M. et al. 2014, Green, M. et al. 2019 and 2022; HDI

The clear top performers (coloured green in Table 30, 3rd column "Total Score") are the countries of CEE (the three Baltic countries, Poland, Bulgaria, Romania, all with values above two). The losers (coloured red in Table 30) are, as to be expected, the Mediterranean countries Greece and Spain plus, perhaps surprisingly, the United States (mainly due to declining life expectancy), Belgium and the UK (mainly because of lacking trust and happiness). Regarding social progress (4th column Table 30), the Mediterranean had a better performance while the Anglo-Saxon countries showed relatively low scores.
The big differences between the two EU peripheries (CEE and Mediterranean) result from the impact of two crises: first the financial crisis and the subsequent sovereign debt panic (called "Euro crisis") and the pandemic, which both hit the South of the EU much more than the East (Dauderstädt, 2021b, 2023). Drawing lessons regarding economic policy is easier for the Southern periphery than for the East. In the sovereign debt crisis, the EU should have avoided austerity policies with the ECB acting as a lender of last resort in a timely and generous way. The East benefitted from a low base after the collapse of communism and large inflows of aid and investment after joining the EU.

This conclusion, based on the changes achieved since 2007, makes the relatively rich countries of, in particular, Western Europe appear in a bad light, and it hides the fact that the actual situation in these countries usually is better than in Southern or Central and Eastern European countries. Table 31 provides the normalized actual values for 2020 (or the next available year).

Table 31: Actual country performance (latest year available)

Region	Country	3Goals	Eco-Score	Total score	SPI	HDI
Western Europe	Austria	1,09	1,11	1,10	1,03	1,01
Western Europe	Belgium	0,99	0,98	0,98	1,02	1,03
Western Europe	France	0,96	0,93	0,94	1,01	1,03
Western Europe	Germany	1,07	1,10	1,08	1,04	0,97
Western Europe	Ireland	1,09	1,11	1,10	1,03	0,98
Western Europe	Luxembourg	1,21	1,27	1,24	1,02	1,01
Western Europe	Netherlands	1,09	1,11	1,10	1,04	1,03
Western Europe	Switzerland	1,25	1,33	1,29	1,06	1,06
Western Europe	United Kingdom	0,93	0,91	0,92	1,01	1,02
Northern Europe	Denmark	1,14	1,18	1,16	1,06	0,98
Northern Europe	Finland	1,20	1,25	1,22	1,06	0,99
Northern Europe	Iceland	1,13	1,17	1,15	1,05	1,04
Northern Europe	Norway	1,22	1,27	1,24	1,06	0,96
Northern Europe	Sweden	1,12	1,16	1,14	1,05	1,04
Southern Europe	Cyprus	0,98	0,96	0,97	0,97	0,98
Southern Europe	Greece	0,89	0,85	0,87	0,96	0,93
Southern Europe	Italy	0,89	0,85	0,87	1,00	0,95
Southern Europe	Malta	0,99	0,97	0,98	0,99	1,03
Southern Europe	Portugal	1,01	1,01	1,01	0,99	0,90
Southern Europe	Spain	0,90	0,86	0,88	1,00	0,99
Central and Eastern Europe	Bulgaria	0,91	0,91	0,91	0,90	1,03
Central and Eastern Europe	Croatia	0,96	0,96	0,96	0,96	0,98
Central and Eastern Europe	Czech Republic	0,85	0,81	0,83	1,00	1,04
Central and Eastern Europe	Estonia	0,99	0,99	0,99	1,01	1,03
Central and Eastern Europe	Hungary	0,89	0,87	0,88	0,91	1,05
Central and Eastern Europe	Latvia	0,81	0,77	0,79	0,96	0,96
Central and Eastern Europe	Lithuania	0,85	0,82	0,83	0,98	1,02
Central and Eastern Europe	Poland	0,80	0,75	0,77	0,94	0,95
Central and Eastern Europe	Romania	0,97	0,98	0,98	0,90	1,03
Central and Eastern Europe	Slovak Republic	0,78	0,72	0,75	0,95	0,93
Central and Eastern Europe	Slovenia	0,89	0,85	0,87	0,98	1,01
Oceania	Australia	1,04	1,04	1,04	1,03	1,04
Northern America	Canada	1,08	1,11	1,10	1,03	0,94
Oceania	New Zealand	1,11	1,14	1,12	1,02	1,05
Northern America	United States	0,93	0,92	0,92	0,99	1,01
	Average					

Source: author's calculation and sources as in Table 30.

The picture that evolves from this focus on the present (or recent past) shows a more familiar pattern with Nordic and most Western European countries performing top. The outliers among the rich countries are the United States and the UK, where the actual picture confirms the results of the, also worrying, longer-term view presented in Table 30.

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ANNEX: TABLES

Table 1: General government net lending/borrowing (Percent of GDP)

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Estimates start after	2009-11	Average
Australia	1,5	-1,1	-4,6	-5,1	-4,5	-3,5	-2,8	-2,9	-2,8	-2,4	-1,7	-1,3	-4,4	-8,8	-6,5	-3,4	2021	-14,2	-3,4
Austria	-1,4	-1,5	-5,4	-4,5	-2,6	-2,2	-2,0	-2,7	-1,0	-1,5	-0,8	0,2	0,6	-8,0	-5,9	-2,7	2020	-12,4	-2,6
Belgium	0,1	-1,1	-5,4	-4,1	-4,3	-4,3	-3,1	-3,1	-2,4	-2,4	-0,7	-0,9	-2,0	-9,0	-5,5	-4,7	2021	-13,8	-3,3
Bulgaria	3,1	2,7	-0,9	-3,8	-1,8	-0,4	-1,8	-3,7	-2,8	1,5	0,8	0,1	-1,0	-2,9	-2,9	-3,3	2021	-6,5	-1,1
Canada	1,8	0,2	-3,9	-4,7	-3,3	-2,5	-1,5	0,2	-0,1	-0,5	-0,1	0,4	0,0	-11,4	-5,0	-2,2	2021	-11,9	-2,0
Croatia	-2,2	-2,8	-6,0	-6,4	-7,9	-5,5	-5,5	-5,5	-3,4	-0,9	0,8	0,0	0,2	-7,3	-2,9	-2,8	2021	-20,3	-3,6
Cyprus	3,2	0,9	-5,4	-4,7	-5,7	-5,6	-5,2	-0,2	0,2	0,2	2,0	-3,6	1,3	-5,8	-1,7	-0,5	2021	-15,8	-1,9
Czech Republic	-0,6	-2,0	-5,4	-4,2	-2,7	-3,9	-1,3	-2,1	-0,6	0,7	1,5	0,9	0,3	-5,8	-5,9	-4,0	2021	-12,3	-2,2
Denmark	5,0	3,2	-2,8	-2,7	-2,1	-3,5	-1,2	1,1	-1,3	-0,1	1,8	0,8	4,1	0,2	2,6	1,2	2021	-7,6	0,4
Estonia	2,7	-2,6	-2,2	0,2	1,1	-0,3	0,2	0,7	0,1	-0,4	-0,7	-0,6	0,1	-5,5	-2,3	-2,9	2021	-0,9	-0,8
Finland	5,1	4,2	-2,5	-2,5	-1,0	-2,2	-2,5	-3,0	-2,4	-1,7	-0,7	-0,9	-0,9	-5,5	-2,6	-2,1	2021	-6,0	-1,3
France	-2,6	-3,3	-7,2	-6,9	-5,2	-5,0	-4,1	-3,9	-3,6	-3,6	-3,0	-2,3	-3,1	-8,9	-6,4	-5,1	2021	-19,2	-4,6
Germany	0,3	-0,1	-3,2	-4,4	-0,9	0,0	0,0	0,6	1,0	1,2	1,3	2,0	1,5	-4,3	-3,7	-3,3	2021	-8,4	-0,8
Greece	-6,8	-10,3	-15,3	-11,3	-10,5	-6,7	-3,8	-4,1	-3,0	0,3	0,9	0,8	0,2	-10,9	-8,0	-4,4	2021	-37,0	-5,8
Hungary	-5,1	-3,8	-4,8	-4,4	-5,2	-2,3	-2,6	-2,8	-2,0	-1,8	-2,5	-2,1	-2,1	-7,8	-6,8	-4,9	2021	-14,4	-3,8
Iceland	5,6	-12,1	-8,6	-6,7	-6,5	-2,6	-1,2	0,3	-0,4	12,5	1,0	0,9	-1,5	-8,9	-7,9	-5,4	2020	-21,8	-2,6
Ireland	0,3	-7,0	-13,9	-32,1	-13,6	-8,5	-6,4	-3,6	-2,0	-0,8	-0,3	0,1	0,4	-5,1	-1,7	0,4	2021	-59,6	-5,9
Italy	-1,3	-2,6	-5,1	-4,2	-3,6	-2,9	-2,9	-3,0	-2,6	-2,4	-2,4	-2,2	-1,5	-9,6	-7,2	-5,4	2021	-13,0	-3,7
Latvia	0,6	-3,1	-6,9	-6,4	-3,3	0,2	-0,6	-1,7	-1,5	-0,4	-0,8	-0,7	-0,4	-3,8	-5,6	-6,0	2021	-16,6	-2,5
Lithuania	-1,0	-3,3	-9,3	-6,9	-8,9	-3,1	-2,6	-0,7	-0,2	0,3	0,5	0,6	0,3	-7,3	-1,0	-2,0	2021	-25,2	-2,8
Luxembourg	4,4	3,4	-0,2	-0,3	0,7	0,5	0,8	1,3	1,3	1,9	1,4	3,0	2,3	-3,4	0,9	-1,1	2020	0,2	1,0
Malta	-2,1	-4,1	-3,2	-2,3	-2,4	-3,4	-2,3	-1,7	-1,0	1,1	3,3	2,1	0,6	-9,5	-7,9	-5,6	2021	-7,9	-2,4
Netherlands	-0,2	0,1	-5,2	-5,3	-4,5	-4,0	-3,0	-2,3	-2,1	0,0	1,3	1,4	1,7	-3,7	-2,6	-0,8	2021	-14,9	-1,8
New Zealand	3,6	1,5	-1,8	-5,5	-5,0	-2,2	-1,3	-0,4	0,3	0,9	1,3	1,3	-2,5	-4,0	-4,8	-4,7	2020	-12,3	-1,5
Norway	17,1	18,6	10,2	10,9	13,4	13,8	10,7	8,6	6,0	4,1	5,0	7,9	6,6	-2,8	9,1	20,3	2021	34,5	10,0
Poland	-1,9	-3,6	-7,3	-7,4	-5,0	-3,8	-4,2	-3,6	-2,6	-2,4	-1,5	-0,2	-0,7	-6,9	-1,9	-4,1	2021	-19,6	-3,6
Portugal	-2,9	-3,7	-9,9	-11,4	-7,7	-6,2	-5,1	-7,3	-4,4	-1,9	-3,0	-0,3	0,1	-5,8	-2,8	-1,9	2021	-28,9	-4,6
Romania	-3,0	-4,6	-6,9	-6,4	-4,4	-2,6	-2,6	-2,1	-1,5	-2,5	-3,0	-2,9	-4,9	-9,8	-6,9	-6,4	2021	-17,7	-4,4
Slovak Republic	-2,1	-2,5	-8,1	-7,5	-4,3	-4,4	-2,9	-3,1	-2,7	-2,6	-1,0	-1,0	-1,3	-5,5	-6,2	-4,0	2021	-20,0	-3,7
Slovenia	0,0	-1,4	-5,8	-5,6	-6,6	-4,0	-14,6	-5,5	-2,8	-1,9	-0,1	0,7	0,4	-7,9	-5,2	-3,1	2021	-18,0	-4,0
Spain	1,9	-4,6	-11,3	-9,5	-9,7	-11,6	-7,5	-6,1	-5,3	-4,3	-3,1	-2,6	-3,1	-10,3	-6,9	-4,9	2021	-30,5	-6,2
Sweden	3,3	1,9	-0,8	-0,1	-0,3	-1,1	-1,5	-1,5	0,0	1,0	1,4	0,8	0,6	-2,8	-0,3	0,1	2020	-1,3	0,0
Switzerland	1,6	1,9	0,5	0,4	0,7	0,2	-0,4	-0,2	0,5	0,2	1,1	1,3	1,3	-3,0	-0,7	-0,1	2021	1,5	0,3
United Kingdom	-2,6	-5,1	-10,0	-9,2	-7,4	-7,6	-5,5	-5,5	-4,5	-3,3	-2,4	-2,2	-2,2	-12,8	-8,0	-4,3	2021	-26,6	-5,8
United States	-2,9	-6,6	-13,2	-11,0	-9,7	-8,1	-4,5	-4,0	-3,5	-4,4	-4,6	-5,3	-5,5	-14,5	-10,9	-4,0	2021	-33,9	-7,0
Average	0,6	-1,6	-5,5	-5,6	-4,1	-3,1	-2,7	-2,1	-1,5	-0,5	-0,2	-0,1	-0,4	-6,8	-4,1	-2,5			

Source: IMF WEO and author's calculation

Table 2: Central bank policy rates (in%)

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Australia	6,25	7,25	3	4,5	4,75	3,5	2,75	2,5	2	1,75	1,5	1,5	1	0,25	0,1	1,35	3,1
Canada	4,5	3	0,25	0,75	1	1	1	1	0,5	0,5	0,75	1,5	1,75	0,25	0,25	2,5	4,5
Switzerland	2,5	2,75	0,375	0,375	0,375	0,125	0,125	0,125	-0,75	-0,75	-0,75	-0,75	-0,75	-0,75	-0,75	-0,25	1
Czechia	3	3,75	1,5	0,75	0,75	0,5	0,05	0,05	0,05	0,05	0,05	1	2	0,25	0,5	7	7
Denmark	4,25	4,6	1,45	0,5	1,2	-0,2	-0,1	0,05	-0,75	-0,65	-0,65	-0,65	-0,65	-0,6	-0,5	-0,1	1,75
United Kingdom	5,75	5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,25	0,5	0,75	0,1	0,1	1,25	3,5
Croatia	3,28	3,5	6,37	1,37	0,47	0,5	0,25	0,22	0,46	0		0				0	
Hungary	7,75	8,5	8,5	5,25	6	7	4	2,1	1,35	0,9	0,9	0,9	0,9	0,6	1,2	10,75	13
Iceland	13,3	15,5	9,5	7,125	3,625	5,125	5,375	5,25	5	5,75	4,5	4,25	3,75	1	1	4,75	6
Norway	4,5	5,75	1,25	2	2,25	1,5	1,5	1,5	1	0,5	0,5	0,5	1,25	0	0	1,25	2,75
New Zealand	8,25	8	2,5	3	2,5	2,5	2,5	3,5	3	2,25	1,75	1,75	1,5	0,25	0,25	2,5	4,25
Poland	4,5	6	3,5	3,5	4,5	4,75	2,5	2,5	1,5	1,5	1,5	1,5	1,5	0,1	0,1	6,5	6,75
Romania	7	10	9	6,25	6,25	5,25	5	3,5	1,75	1,75	1,75	2,5	2,5	1,75	1,25	4,75	7
Sweden	3,5	4,5	0,25	0,5	2	1,5	1	0,25	-0,35	-0,5	-0,5	-0,5	-0,25	0	0	0,75	2,5
United States	5,25	2	0,125	0,125	0,125	0,125	0,125	0,125	0,125	0,375	1,125	1,875	2,375	0,125	0,125	2,375	4,375
Euro area	4	4,25	1	1	1,5	0,75	0,5	0,15	0,05	0	0	0	0	0	0	0,5	2,5
Average	5,47	5,90	3,07	2,34	2,36	2,15	1,69	1,46	0,96	0,87	0,85	0,99	1,18	0,22	0,24	2,87	4,67

Source: BIS and author's calculation

Table 3: Taxes on goods and services (% of total tax revenue)

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Ø	σ
Australia	23,2	22,6	22,7	24,4	24,0	22,2	23,0	23,5	21,3	21,7	21,1	20,5	19,5	19,3	22,1	1,57
Austria	26,8	26,4	27,0	27,2	27,3	27,4	26,7	26,6	26,3	27,0	27,2	26,6	26,5	26,3	26,8	0,37
Belgium	25,4	24,4	25,1	25,4	24,7	25,0	24,3	24,1	24,8	26,5	26,1	26,0	26,8	26,4	25,4	0,87
Bulgaria	43,9	45,2	42,7	44,6	45,9	45,3	45,5	43,2	44,0	46,2	44,8	40,9	41,4	43,6	44,1	1,60
Canada	15,0	13,6	14,7	15,3	14,5	14,1	13,9	14,0	13,8	13,9	13,9	13,5	13,8	13,7	14,1	0,54
Croatia	43,9	44,6	42,8	45,2	45,0	45,7	47,8	47,8	47,6	46,2	46,8	47,7	47,6	44,6	46,0	1,64
Cyprus	35,1	36,5	34,7	34,1	33,4	34,9	33,8	34,3	34,8	36,5	35,4	35,6	33,9	31,7	34,6	1,25
Czechia	27,0	26,6	28,2	28,5	29,9	30,9	31,4	29,9	30,3	30,3	30,1	28,5	28,3	26,9	29,1	1,54
Denmark	38,8	37,2	37,4	36,6	36,2	36,2	35,7	33,3	36,0	36,8	36,0	37,2	34,0	34,9	36,2	1,42
Estonia	37,2	33,4	34,4	35,0	36,2	36,8	36,1	37,1	37,1	38,8	37,8	37,2	37,6	35,2	36,4	1,48
Finland	33,9	33,3	36,1	36,7	37,6	37,8	38,4	38,3	37,9	38,4	38,5	39,0	38,8	40,1	37,5	1,90
France	23,5	22,7	22,8	22,1	22,3	22,1	21,9	22,0	22,3	22,5	22,7	22,9	23,5	23,2	22,6	0,53
Germany	24,0	23,9	24,6	24,7	24,8	24,3	23,9	23,5	23,2	22,0	22,0	21,3	21,0	18,9	23,0	1,73
Greece	31,2	31,0	30,8	31,5	31,6	30,5	30,0	31,8	31,4	32,4	33,0	33,3	33,6	31,5	31,7	1,05
Hungary	34,5	32,0	33,5	37,2	37,8	37,5	37,0	36,9	36,4	36,4	36,4	37,4	37,5	38,4	36,3	1,79
Iceland	38,7	30,1	31,2	34,4	33,4	33,6	33,4	31,9	34,5	23,7	36,0	35,7	36,4	37,7	33,6	3,72
Ireland	37,8	35,9	33,1	32,7	30,3	30,0	30,9	31,6	31,2	31,4	31,6	30,3	30,3	27,7	31,8	2,54
Italy	22,7	21,7	21,1	22,8	23,4	23,6	23,4	24,2	23,9	24,2	24,4	24,5	24,2	22,6	23,3	1,05
Latvia	42,0	38,1	36,6	38,2	39,2	39,9	41,6	42,5	43,4	45,0	44,5	44,2	44,7	43,0	41,6	2,77
Lithuania	33,7	33,2	32,2	34,3	35,1	33,9	34,0	33,3	34,2	34,2	35,3	45,4	37,2	38,6	35,3	3,32
Luxembourg	32,5	30,3	29,5	29,7	30,2	30,5	30,5	31,6	26,7	27,0	27,6	26,8	26,6	26,5	29,0	2,06
Malta	37,6	37,0	36,2	36,8	36,2	34,9	34,1	34,5	33,2	33,6	32,7	33,7	33,1	30,9	34,6	1,93
Netherlands	28,7	27,4	27,3	26,9	26,3	25,4	25,2	25,7	26,1	26,7	26,5	26,9	27,6	27,6	26,7	0,95
New Zealand	25,9	24,0	24,5	26,6	27,5	29,2	28,9	28,9	29,0	29,2	29,1	29,4	28,8	29,5	27,9	1,88
Norway	24,2	21,3	24,5	24,9	23,2	22,8	24,1	24,6	25,9	27,4	26,9	25,2	25,1	28,1	24,9	1,82
Poland	37,3	38,3	36,3	38,4	38,0	35,4	35,4	35,6	35,3	36,4	36,8	36,8	36,2	35,7	36,6	1,09
Portugal	32,7	31,7	29,2	31,5	31,5	31,5	29,2	30,4	31,6	32,6	33,0	33,0	32,9	31,2	31,6	1,27
Romania	34,6	34,6	33,6	36,4	39,5	40,2	39,8	37,8	38,3	36,0	33,8	33,0	33,8	32,4	36,0	2,68
Slovak Republic	32,6	31,0	29,0	29,8	30,5	29,2	28,8	28,8	27,5	29,3	31,8	31,4	31,4	31,0	30,1	1,46
Slovenia	48,2	48,6	51,7	53,2	53,1	53,2	54,3	53,8	51,8	54,0	53,2	51,7	51,4	49,8	52,0	1,95
Spain	..	..	..	..	..	..	..	..	..	..	28,7	28,0	27,5	25,8	27,5	1,23
Sweden	35,5	37,1	38,8	38,9	38,5	38,7	38,3	38,3	37,8	37,8	37,5	37,7	37,4	38,3	37,9	0,89
Switzerland	32,8	31,8	31,6	32,4	32,0	31,8	31,2	31,3	30,2	30,0	29,5	29,0	28,3	28,8	30,8	1,44
United Kingdom	32,3	30,2	30,9	28,6	34,8	34,6	34,7	35,8	35,6	35,3	34,8	34,7	34,9	33,1	33,6	2,25
United States*	2,4	2,5	3,0	2,8	3,0	3,0	2,8	3,0	2,9	2,8	2,4	3,1	2,6	2,4	2,8	0,24
Average	31,6	30,5	30,5	31,4	31,7	31,5	31,5	31,5	31,4	31,5	31,7	31,7	31,3	30,7	31,2	1,60

Source: World Development Indicators (WDI) and author's calculation;
** US values are underestimating the true share because they probably exclude sales taxes that are levied by the states.*

Table 4: Taxes on income. Profits and capital gains (% of total tax revenue)

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Ø	∑
Australia	65,7	66,3	65,0	61,3	63,4	65,5	64,2	63,7	64,9	64,2	64,1	65,2	65,9	64,5	64,6	1,26
Austria	28,1	29,0	26,0	26,4	26,7	27,0	27,4	27,9	28,7	26,4	27,0	27,5	27,6	25,6	27,2	0,99
Belgium	36,6	36,9	34,1	34,7	35,3	35,4	36,1	36,4	34,7	32,4	33,7	34,0	32,5	32,2	34,6	1,58
Bulgaria	17,2	15,5	15,1	15,2	15,3	14,6	14,9	15,2	15,6	16,7	17,1	16,1	15,7	16,9	15,8	0,86
Canada	54,8	55,2	53,5	52,8	53,8	53,0	53,1	54,1	54,0	54,4	54,5	55,2	54,5	55,8	54,2	0,89
Croatia	9,8	9,5	9,2	8,2	8,0	6,5	6,8	6,0	6,8	7,3	7,3	7,3	7,4	7,1	7,7	1,14
Cyprus	28,8	27,9	25,7	24,8	27,2	26,5	26,2	23,7	23,4	23,7	24,5	24,1	23,5	24,7	25,3	1,74
Czechia	18,3	16,9	15,5	14,8	14,8	14,7	14,6	15,4	14,9	15,7	16,1	16,6	16,8	16,6	15,8	1,11
Denmark	42,0	41,5	42,0	41,3	40,3	41,9	43,2	48,0	45,3	44,7	45,2	42,9	47,2	46,0	43,7	2,39
Estonia	21,0	22,1	18,0	17,4	17,5	18,2	20,0	20,5	20,9	20,3	19,7	20,5	19,8	20,7	19,7	1,42
Finland	20,8	19,8	15,1	14,5	15,5	14,7	14,7	15,1	15,2	15,3	15,9	15,9	15,9	14,5	15,9	1,92
France	25,2	25,8	23,1	23,2	24,4	25,5	25,9	25,4	25,5	25,3	25,7	27,5	28,2	28,6	25,7	1,60
Germany	16,7	17,1	15,5	15,0	15,4	16,1	16,5	16,5	16,8	17,3	17,7	18,0	17,8	17,3	16,7	0,94
Greece	19,0	18,6	20,1	17,8	17,1	18,9	16,5	19,0	17,9	18,6	18,8	19,4	18,2	16,7	18,3	1,03
Hungary	20,5	24,7	22,9	19,1	15,5	15,4	14,8	15,2	15,2	16,9	17,0	15,9	16,1	16,6	17,5	3,10
Iceland	27,0	24,6	23,5	24,7	23,8	23,3	25,2	27,6	28,0	19,9	30,6	29,7	31,1	33,1	26,6	3,66
Ireland	38,7	37,1	36,5	35,9	35,5	36,8	36,4	36,3	39,0	39,4	40,1	41,7	42,0	45,1	38,6	2,83
Italy	35,3	35,5	32,9	33,2	32,6	33,2	33,5	32,7	32,7	32,2	32,1	31,4	31,8	33,1	33,0	1,17
Latvia	13,7	15,6	8,7	7,4	8,1	9,1	9,3	9,1	9,3	10,2	10,3	7,2	4,7	6,1	9,2	2,80
Lithuania	27,2	27,3	17,2	13,9	13,6	15,2	15,8	15,4	16,4	17,0	16,7	22,6	29,1	29,7	19,8	6,01
Luxembourg	27,9	28,8	28,3	29,3	28,6	28,8	29,2	28,8	30,0	30,3	30,8	33,1	32,6	32,0	29,9	1,63
Malta	31,1	30,7	32,3	30,2	30,5	31,9	33,3	32,3	31,9	34,1	34,1	33,0	34,9	34,4	32,5	1,53
Netherlands	26,9	25,3	26,1	26,2	25,1	23,5	22,8	24,2	26,7	26,7	29,6	29,1	30,8	30,6	26,7	2,52
New Zealand	56,7	59,5	56,0	51,0	45,4	49,0	50,3	50,3	51,6	51,9	52,8	53,3	54,2	53,5	52,5	3,49
Norway	31,1	32,6	29,1	31,2	32,8	31,9	29,2	25,7	22,2	20,7	21,9	24,2	23,4	18,3	26,7	4,94
Poland	14,9	15,3	13,8	12,5	12,4	12,7	12,1	12,1	12,1	12,3	12,5	13,0	13,3	13,2	13,0	1,01
Portugal	22,4	22,8	21,6	21,3	23,0	21,3	25,9	25,2	25,3	24,1	24,0	24,1	23,3	23,6	23,4	1,48
Romania	19,0	20,0	19,8	17,7	18,2	17,2	17,9	18,2	18,8	20,3	19,8	15,2	15,2	14,5	18,0	1,87
Slovak Republic	18,6	19,7	15,9	16,0	15,4	15,7	16,2	17,1	17,0	18,4	19,4	19,5	19,0	18,7	17,6	1,60
Slovenia	23,2	21,7	18,3	16,6	16,0	14,0	11,8	12,8	14,1	16,0	16,5	17,9	18,2	18,0	16,8	3,16
Spain	..	..	..	..	..	..	..	..	..	..	19,8	20,7	19,4	18,0	19,5	1,11
Sweden	17,7	14,0	13,0	14,8	14,1	12,4	12,9	14,1	15,9	15,7	16,2	15,5	15,5	14,7	14,8	1,46
Switzerland	19,8	22,7	21,5	21,3	20,8	20,5	21,0	20,7	22,6	22,5	24,6	24,5	25,8	22,0	22,2	1,75
United Kingdom	39,7	37,8	38,5	32,5	36,8	34,5	33,9	34,1	34,2	34,7	34,6	34,5	34,2	35,4	35,4	2,04
United States	56,0	53,3	45,5	47,7	52,8	53,5	51,1	53,1	54,2	54,0	49,5	51,5	52,3	51,4	51,8	2,76
Average	28,6	28,6	26,4	25,6	25,8	25,8	26,0	26,2	26,5	26,5	26,9	27,1	27,4	27,1	26,6	2,00

Source: WDI and author's calculation

Table 5: Top statutory personal income tax rate and thresholds (in multiple of average wage and USD converted at PPP) for selected years

	2007		2014		2021	
Country	Rate in %	Multiple of average wage	Rate in %	Multiple of average wage	Rate in %	Multiple of average wage
Australia	46.5	2.6	46.5	2.3	47.0	1.9
Austria	43.7	1.9	50.0	13.9	55.0	21.7
Belgium	53.7	1.0	53.8	1.6	52.9	1.0
Bulgaria					28.0	
Canada	46.4	2.2	49.5	3.4	53.5	3.0
Croatia					40.0	
Cyprus					35.0	
Czech Republic	32.0	1.5	15.0	0.0	23.0	3.9
Denmark	59.0	1.0	55.6	1.2	55.9	1.3
Estonia	22.0	0.2	21.0	0.1	20.0	0.3
Finland	50.5	1.8	51.5	2.5	51.3	1.9
France	45.8	2.8	54.5	15.1	55.4	14.7
Germany	47.5	6.3	47.5	5.7	47.5	5.5
Greece	40.0	3.7	46.0	5.3	44.0	2.5
Hungary	36.0	0.8	16.0	0.0	15.0	0.0
Iceland	35.7	0.0	46.2	1.4	46.3	1.2
Ireland	43.5	2.4	48.0	0.8	48.0	1.4
Italy	44.9	3.2	47.8	9.9	47.2	2.4
Latvia	25.0	0.2	24.0	0.1	31.0	4.1
Lithuania	27.0	0.2	15.0	0.2	32.0	4.3
Luxembourg	39.0	0.9	43.6	3.0	45.8	3.2
Malta					35.0	
Netherlands	52.0	1.3	52.0	1.2	49.5	1.3
New Zealand	39.0	1.4	33.0	1.3	39.0	2.7
Norway	40.0	1.5	39.0	1.6	38.2	1.5
Poland	40.0	3.1	32.0	2.3	32.0	1.6
Portugal	42.0	4.4	56.5	16.2	53.0	13.6
Romania					45.0	
Slovak Republic	19.0	0.4	25.0	3.8	25.0	3.1
Slovenia	41.0	1.4	50.0	5.3	50.0	4.3
Spain	43.0	2.6	52.0	11.7	45.5	11.4
Sweden	56.6	1.5	56.9	1.5	52.3	1.1
Switzerland	42.1	3.2	41.7	3.5	41.7	3.2
United Kingdom	40.0	1.2	45.0	4.3	45.0	3.4
United States	41.4	8.4	46.3	8.2	43.7	8.5
Average	41.1	2.1	42.0	4.2	42.0	4.3

Source: OECD

Table 6: Minimum wages (as percentage of median wage)

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average	Change
Australia	54,4	52,2	54,3	54,2	53,5	52,7	53,9	53	53,2	53,8	54,2	53,5	53,8	52,6	51,5	53,4	-2,9
Austria																	
Belgium	47,9	47,9	49,4	48,2	48,6	48,3	49,3	47,2	45,3	45,7	45,2	42,6	42,5	43,9	44,7	46,4	-3,2
Bulgaria				54,4	:	:	:	62,6	:	:	:	65,9				61,0	11,5
Canada	40,7	41,7	42,2	43,9	44,6	45,3	44,3	45	44,5	45,7	45,7	51,4	51,2	48,9	49,5	45,6	8,8
Croatia	..	..	..	45,4	..	..	..	44,5	..	..	..	45,6	46,2	45,8	..	45,5	0,4
Cyprus																	
Czechia	40,7	38,3	38,3	37,6	37,1	36,3	36,8	37,2	38,7	39,6	40,9	41,8	42,9	43,9	43,2	39,6	2,5
Denmark																	
Estonia	35,7	37,8	39,8	40,4	38,1	37,6	38,8	39,8	41,3	42,3	43,4	43	43,3	45,5	42,6	40,6	6,9
Finland																	
France	63,3	62,9	62,7	62,1	61,9	63	62,8	62,5	62,3	62	61,7	61,6	61,4	61,1	60,9	62,1	-2,4
Germany	..	..	..	..	..	..	..	..	48,1	47,1	48,5	47,6	49,7	50,2	51,1	48,9	3
Greece	44,4	46,1	46,3	46,5	48,5	41	43,3	42	42,3	43,9	43,2	45,5	49,7	50,5	49,8	45,5	5,4
Hungary	46,7	46	46,6	47,4	49,4	53,8	53,8	53,5	52,5	51,1	52	50,5	49,3	48,3	45,2	49,7	-1,5
Iceland																	
Ireland	42,7	42,1	37,6	45,3	44,4	45,3	44,6	40,4	39,2	42,3	42,1	49,6	48,8	47,8	46,1	43,9	3,4
Italy																	
Latvia	36,6	40,4	47,3	48,9	50,6	48,8	46,6	49,2	51,8	50,7	48,3	46,7	43,4	40,5	42,3	46,1	5,7
Lithuania	39,3	40,5	42,4	49,8	48,4	48,2	55,7	51,1	51,8	55,8	53,5	49,6	49,1	48,8	46,7	48,7	7,4
Luxembourg	54,1	53,3	54,2	55,4	55,8	55,5	54,8	54,9	54,4	54	54,4	54,7	55,4	53,8	54,8	54,6	0,7
Malta			56,6	56,0	56,9	55,4	56,6	56,0	56,5	57,3	55,6	55,0	54,1	53,6	67,3	56,7	67,3
Netherlands	48,7	48,7	49	47,3	46,9	46,9	46,6	46,8	46,6	46,9	47,3	47,1	47,1	46,6	46,3	47,3	-2,4
New Zealand	57,3	59	59	58,8	58,8	59,4	59,1	59,8	60	60,5	60,3	61,3	64,4	64,6	67,6	60,7	10,3
Norway																	
Poland	39,6	42,6	45,8	45,3	45,2	48,1	49,5	51	51,2	52,6	53,9	51,2	51,2	55,5	55	49,2	15,4
Portugal	47,6	48,6	49,8	52,7	52,7	52,1	52,2	54,8	56,3	58,5	60,1	63,2	63,2	65,6	66,2	56,2	18,6
Romania	38	40,6	43,5	42,6	45,4	45,2	47,7	51,3	54,9	55,7	59,6	58,3	56,5	57	54,8	50,1	16,8
Slovak Republic	44,3	42,8	45,3	45,6	45,6	45,1	45,5	45,1	47,3	47,7	47,9	49,2	49,3	51,7	52,4	47,0	8,1
Slovenia	49,5	49,4	49,5	58,9	60,6	62	63,7	60	59,7	58,7	58,2	58,2	58,7	58,8	60,4	57,8	10,9
Spain	39,2	39,1	39,1	37,7	38,1	38	37,8	36,9	37	37,6	39,9	41	49,5	51,4	48,4	40,7	9,2
Sweden																	
Switzerland																	
United Kingdom	46,6	46	46,1	46,1	46,9	47,3	47,1	47,9	48,6	52,7	53,5	54,4	55,1	57,5	56,9	50,2	10,3
United States	31,4	34,1	37,1	38,8	38,3	37,7	37,3	36,6	35,8	34,8	33,7	32,7	31,6	29,4	29	34,6	-2,4
Average	44,9	45,5	47,0	48,4	48,5	48,4	49,0	49,2	49,1	49,9	50,1	50,8	50,7	50,9	51,4	48,9	6,4

Source: OECD and Eurostat and author's calculation

Table 7: Strictness of employment protection legislation

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Australia	1,65	1,65	1,65	2,01	2,01	2,01	2,01	2,01	2,01	2,01	2,01	2,01	2,01
Austria	2,56	2,56	2,56	2,56	2,56	2,56	2,56	2,56	2,56	2,56	2,56	2,56	2,56
Belgium	2,60	2,60	2,60	2,73	2,73	2,60	2,60	2,63	2,87	2,87	2,87	2,87	2,87
Canada	1,31	1,31	1,31	1,31	1,31	1,31	1,31	1,31	1,31	1,31	1,31	1,31	1,31
Czech Republic	3,02	3,02	3,02	3,02	3,02	2,93	2,93	2,93	2,93	2,93	2,93	2,93	2,93
Denmark	1,87	1,87	1,87	1,87	1,92	1,92	1,92	1,92	1,92	1,92	1,92	1,92	1,92
Estonia	..	2,46	2,46	2,11	2,11	2,11	2,11	2,11	2,11	2,11	2,11	2,11	2,11
Finland	2,02	1,95	1,95	1,95	1,95	1,95	1,95	1,95	1,95	1,95	1,89	1,89	1,89
France	2,83	2,74	2,68	2,68	2,68	2,68	2,68	2,68	2,68	2,68	2,68	2,72	2,72
Germany	2,89	2,89	2,89	2,89	2,89	2,89	2,89	2,89	2,89	2,89	2,89	2,89	2,89
Greece	3,06	3,06	3,06	3,06	2,61	2,61	2,57	2,57	2,57	2,57	2,57	2,57	2,57
Hungary	2,40	2,40	2,40	2,40	2,40	2,40	2,17	2,17	2,17	2,17	2,17	2,17	2,17
Iceland	..	..	..	..	..	..	1,94	1,94	1,94	1,94	1,94	1,94	1,94
Ireland	1,79	1,79	1,79	1,79	1,79	1,88	1,88	1,88	1,88	1,88	1,88	1,88	1,88
Italy	3,33	3,33	3,33	3,33	3,33	3,33	3,17	3,17	3,17	2,84	2,62	2,62	2,68
Latvia	..	..	..	..	..	3,23	3,23	3,23	3,23	3,23	3,23	3,23	3,23
Lithuania	..	..	..	..	..	..	..	2,70	2,70	2,70	2,70	2,34	2,34
Luxembourg	..	2,63	2,63	2,63	2,63	2,63	2,63	2,63	2,63	2,63	2,63	2,63	2,63
Netherlands	3,22	3,22	3,17	3,17	3,17	3,17	3,22	3,22	3,22	3,37	3,37	3,37	3,49
New Zealand	1,29	1,29	1,29	1,29	1,29	1,17	1,17	1,17	1,17	1,17	1,17	1,17	1,17
Norway	2,38	2,38	2,38	2,38	2,38	2,38	2,38	2,38	2,38	2,38	2,38	2,38	2,38
Poland	2,48	2,48	2,48	2,48	2,48	2,48	2,48	2,48	2,48	2,48	2,48	2,48	2,48
Portugal	3,98	3,69	3,69	3,49	3,49	3,08	2,96	2,78	2,78	2,78	2,78	2,78	2,78
Slovak Republic	3,13	3,13	3,13	3,13	3,13	2,66	2,76	2,76	2,76	2,76	2,76	2,76	2,76
Slovenia	..	2,93	2,93	2,93	2,90	2,90	2,90	2,52	2,52	2,52	2,52	2,52	2,52
Spain	2,65	2,65	2,65	2,65	2,55	2,55	2,26	2,26	2,26	2,26	2,26	2,26	2,32
Sweden	2,60	2,60	2,60	2,60	2,60	2,60	2,60	2,60	2,60	2,60	2,60	2,60	2,60
Switzerland	2,06	2,06	2,06	2,06	2,06	2,06	2,06	2,06	2,06	2,06	2,06	2,06	2,06
United Kingdom	1,76	1,76	1,76	1,76	1,76	1,76	1,64	1,57	1,57	1,57	1,57	1,57	1,57
United States	0,67	0,67	0,67	0,67	0,67	0,67	0,67	0,67	0,67	0,67	0,67	0,67	0,67
Croatia	..	..	..	..	..	..	..	..	2,42	..	..	..	..

Source: OECD and author's calculation

Table 8: Annual GDP per capita growth (in%)

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average
Australia	1,9	1,5	-0,2	0,6	1,0	2,1	0,8	1,1	0,7	1,1	0,6	1,3	0,7	-1,3	2,1	0,9
Austria	3,4	1,1	-4,0	1,6	2,6	0,2	-0,6	-0,1	-0,1	0,9	1,6	1,9	1,1	-6,8	4,1	0,5
Belgium	2,9	-0,3	-2,8	1,9	0,4	0,1	0,0	1,1	1,5	0,8	1,2	1,3	1,7	-5,8	5,6	0,6
Bulgaria	7,4	6,9	-2,7	2,2	2,8	1,3	0,0	1,5	4,1	3,8	3,5	3,4	4,8	-3,4	8,5	2,9
Canada	1,1	-0,1	-4,0	1,9	2,1	0,7	1,3	1,8	-0,1	-0,1	1,8	1,3	0,4	-6,3	4,0	0,4
Croatia	5,0	2,0	-7,1	-1,0	0,3	-2,0	-0,1	0,0	3,4	4,3	4,7	3,7	4,0	-8,2	17,4	1,8
Cyprus	2,9	1,1	-4,6	-0,4	-2,1	-4,9	-6,4	-0,7	4,0	6,1	4,8	4,4	4,1	-5,5	5,6	0,6
Czechia	5,0	1,8	-5,2	2,1	1,6	-0,9	-0,1	2,2	5,2	2,3	4,9	2,9	2,6	-5,7	5,4	1,6
Denmark	0,5	-1,1	-5,4	1,4	0,9	-0,1	0,5	1,1	1,6	2,4	2,2	1,5	1,1	-2,3	4,4	0,6
Estonia	8,1	-4,9	-14,5	2,7	7,6	3,6	1,8	3,3	1,8	3,1	5,7	3,4	3,4	-0,7	7,9	2,1
Finland	4,9	0,3	-8,5	2,7	2,1	-1,9	-1,4	-0,8	0,2	2,5	3,0	1,0	1,1	-2,3	2,8	0,4
France	1,8	-0,3	-3,4	1,4	1,7	-0,2	0,1	0,5	0,8	0,8	2,0	1,5	1,5	-8,0	6,5	0,4
Germany	3,1	1,2	-5,5	4,3	5,9	0,2	0,2	1,8	0,6	1,4	2,3	0,7	0,8	-3,8	2,6	1,1
Greece	3,0	-0,6	-4,6	-5,6	-10,0	-6,6	-1,8	1,1	0,5	-0,1	1,3	1,9	2,0	-8,8	9,0	-1,3
Hungary	0,4	1,2	-6,5	1,3	2,2	-0,7	2,1	4,5	4,0	2,5	4,5	5,5	4,9	-4,3	7,6	1,9
Iceland	5,7	0,3	-8,0	-2,7	1,5	0,5	3,6	0,6	3,4	4,8	1,8	2,1	0,2	-8,3	2,7	0,5
Ireland	2,3	-6,4	-6,1	1,1	0,4	-0,4	0,6	7,9	23,2	0,9	7,8	7,2	4,0	5,1	12,5	4,0
Italy	1,0	-1,6	-5,7	1,4	0,5	-3,2	-3,0	-0,9	0,9	1,5	1,8	1,1	1,6	-8,6	7,3	-0,4
Latvia	10,8	-2,2	-12,8	-2,4	4,5	8,4	3,1	2,9	4,7	3,3	4,2	4,8	3,3	-1,5	4,9	2,4
Lithuania	12,4	3,7	-13,9	3,8	8,5	5,2	4,6	4,4	3,0	3,8	5,8	5,0	4,9	0,0	5,8	3,8
Luxembourg	6,4	-2,1	-5,0	1,9	-1,2	-0,8	0,8	0,2	-0,1	2,7	-1,1	-0,7	0,3	-2,4	3,5	0,2
Malta	4,4	3,2	-1,9	5,0	0,0	3,2	4,0	5,5	7,0	1,0	7,9	2,5	1,8	-10,3	9,6	2,9
Netherlands	3,5	1,8	-4,2	0,8	1,1	-1,4	-0,4	1,1	1,5	1,6	2,3	1,8	1,3	-4,4	4,3	0,7
New Zealand	2,1	-1,9	-1,1	0,4	1,5	1,7	1,9	2,1	1,7	1,5	1,4	1,5	0,6	-3,4	3,1	0,9
Norway	1,9	-0,8	-3,0	-0,5	-0,3	1,4	-0,2	0,8	1,0	0,2	1,5	0,5	0,1	-1,3	3,3	0,3
Poland	7,1	4,2	2,8	3,2	5,0	1,5	0,9	3,9	4,5	3,0	5,1	5,9	4,5	-1,8	7,3	3,8
Portugal	2,3	0,2	-3,2	1,7	-1,6	-3,7	-0,4	1,3	2,2	2,3	3,8	3,0	2,7	-8,4	5,2	0,5
Romania	8,8	11,1	-4,7	-3,3	5,0	2,4	0,6	4,5	3,6	3,4	8,8	6,7	4,4	-3,1	5,9	3,6
Slovak Republic	10,8	5,5	-5,6	6,6	2,5	1,1	0,5	2,6	5,1	1,8	2,8	3,9	2,4	-3,5	3,2	2,7
Slovenia	6,4	3,3	-8,4	0,9	0,7	-2,8	-1,2	2,7	2,1	3,1	4,7	4,1	2,7	-5,0	7,9	1,4
Spain	1,7	-0,7	-4,6	-0,3	-1,2	-3,0	-1,1	1,7	3,9	3,0	2,7	1,8	1,3	-11,8	5,4	-0,1
Sweden	2,7	-1,2	-5,2	5,1	2,4	-1,3	0,3	1,6	3,4	0,8	1,2	0,8	1,0	-2,9	4,4	0,9
Switzerland	3,0	1,5	-3,5	2,2	0,7	0,1	0,6	1,1	0,5	1,0	0,4	2,1	0,4	-3,1	3,4	0,7
United Kingdom	1,8	-0,9	-5,2	1,6	0,3	0,7	1,1	2,4	1,6	1,4	1,7	1,1	1,0	-11,4	7,1	0,3
United States	1,0	-0,8	-3,5	1,9	0,8	1,5	1,1	1,5	2,0	0,9	1,6	2,4	1,8	-3,7	5,8	1,0
Average	4,2	0,7	-5,2	1,3	1,4	0,1	0,4	1,9	2,9	2,1	3,2	2,7	2,1	-4,7	5,9	1,3

Source: World Development Indicators and author's calculation

Table 9: Growth of hours worked in the total economy (in percent)

Country	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average
Australia	2,61	-1,12	2,64	1,53	1,04	0,66	0,11	1,74	1,03	2,32	2,36	1,71	-3,79	3,75	1,18
Austria	1,35	-2,85	0,48	1,22	-0,64	-0,49	-0,46	-0,14	2,55	0,34	1,65	1,27	-8,39	3,20	-0,06
Belgium	0,75	-1,76	2,25	1,48	0,14	0,08	0,04	-0,27	0,70	1,38	2,66	1,42	-9,06	4,58	0,31
Bulgaria															
Canada	1,26	-3,25	1,51	1,45	1,64	0,93	0,17	0,78	0,31	1,40	2,35	1,17	-7,78	7,43	0,67
Croatia	2,12	-0,81	-3,13	-4,08	-4,42	-3,56	1,68	-2,17	0,67	1,85	1,88	4,58	-1,42		-0,52
Cyprus	3,84	-1,07	0,50	0,40	-3,66	-7,38	-1,73	2,07	5,53	4,35	4,63	4,55	-6,32	4,82	0,75
Czech Republic	2,47	-1,96	0,13	0,10	-1,26	0,27	1,29	0,09	3,23	1,75	1,85	0,25	-5,84	2,47	0,35
Denmark	-0,10	-3,99	-1,75	0,96	-1,50	-0,16	0,21	1,22	2,24	0,46	-0,09	0,88	-2,99	3,27	-0,10
Estonia	-1,76	-15,70	-2,17	8,71	0,21	-0,02	0,22	2,11	0,81	2,22	-2,53	0,24	-5,50	7,54	-0,40
Finland	1,32	-4,18	-0,08	0,62	-0,25	-1,57	-0,51	-0,62	0,46	0,63	2,53	0,49	-2,07	1,09	-0,15
France	1,72	-1,74	0,81	0,50	-0,15	-1,05	1,75	0,35	0,69	-0,12	1,27	0,66	-7,77	8,78	0,41
Germany	0,98	-3,10	0,21	2,17	-0,46	0,21	1,14	0,89	2,23	0,49	0,28	0,93	-5,37	1,02	0,12
Greece	0,79	-2,36	-5,69	-6,72	-7,01	-4,60	-1,73	1,35	2,15	2,38	2,75	-0,14	-10,52	9,64	-1,41
Hungary	-1,19	-4,41	0,06	-0,01	0,92	1,44	6,26	2,52	4,20	0,86	0,07	0,51	-4,88	6,58	0,92
Iceland	2,14	-11,25	-0,84	0,78	0,20	3,24	1,82	3,25	4,31	0,93	1,56	0,26	-5,45	0,39	0,10
Ireland	-2,12	-9,95	-9,25	-1,02	-0,36	3,35	3,45	4,25	3,19	3,60	3,29	2,25	-2,61	5,88	0,28
Italy	0,24	-3,40	-0,67	0,08	-2,34	-2,48	0,23	0,90	1,55	1,02	0,85	0,09	-10,93	5,76	-0,65
Latvia	-2,60	-16,03	-7,18	2,16	0,71	1,74	-0,48	-0,63	-0,27	-0,67	2,33	-1,75	-5,13	-1,13	-2,07
Lithuania	-0,15	-11,06	-2,32	-0,85	1,64	0,44	1,56	2,64	3,27	-2,68	1,91	0,35	-5,64	2,35	-0,61
Luxembourg	-0,26	3,05	1,86	1,73	4,61	0,58	3,31	5,30	1,11	3,67	3,04	3,15	-4,71	2,13	2,04
Malta	3,18	0,30	-0,76	-0,31	1,23	2,78	2,99	3,19	8,73	4,30	8,74	10,06	-5,03	3,01	3,03
Netherlands	2,29	-0,53	-1,15	0,06	-0,04	-0,42	0,17	1,02	2,12	2,07	2,19	2,28	-2,21	4,06	0,85
New Zealand	-0,42	-2,54	1,28	0,92	-0,91	3,30	3,93	2,32	4,88	4,30	2,72	3,01	-1,22	1,68	1,66
Norway	3,61	-2,03	0,61	1,74	1,71	-0,06	1,16	0,72	0,13	-0,52	1,57	1,06	-1,05	4,75	0,96
Poland	3,27	-0,32	-2,74	0,32	-0,07	-0,32	2,21	1,78	0,82	0,30	-0,97	-0,41	-0,89	4,83	0,56
Portugal	-0,21	-2,86	-1,27	-4,44	-4,96	-2,06	2,01	1,51	1,59	2,67	2,95	1,31	-9,47	2,33	-0,78
Romania	-1,61	-4,69	-1,90	-1,86	-0,63	-1,16	-0,02	-1,64	0,17	1,08	0,15	1,03	-4,59		-1,21
Slovak Republic	3,34	-3,48	-0,69	-0,76	0,37	-0,94	0,76	2,23	1,99	0,02	0,84	-0,05	-8,98	1,88	-0,25
Slovenia	2,25	-1,24	-1,40	-4,07	-2,46	-0,86	2,39	0,41	-2,33	2,88	0,81	0,37	-4,68	3,39	-0,33
Spain	-0,02	-6,35	-2,57	-1,34	-5,07	-3,19	1,24	3,23	3,10	2,09	2,99	1,45	-9,45	7,65	-0,45
Sweden	1,82	-2,93	2,27	2,32	-0,17	0,43	1,54	1,46	2,36	1,49	1,47	-0,20	-3,16	2,39	0,79
Switzerland	2,01	0,40	-3,78	1,96	0,25	-0,31	1,20	2,35	1,48	-0,44	0,34	0,53	-3,49	2,07	0,33
United Kingdom	-0,22	-2,15	-0,35	1,05	2,14	1,33	2,95	0,60	2,55	0,63	1,23	1,14	-12,05	9,45	0,59
United States	-0,98	-5,14	0,02	0,96	2,07	0,93	1,74	1,79	1,49	1,21	1,81	0,90	-6,72	4,63	0,34
Average	0,93	-3,84	-1,03	0,23	-0,51	-0,26	1,25	1,37	2,03	1,42	1,81	1,33	-5,56	4,11	0,23

Source: Eurostat + OECD and author's calculation

Table 10: Growth of productivity (GDP/h in percent)

Country	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average
Australia	5,59	8,17	0,74	7,14	4,67	1,75	3,93	-0,19	1,07	3,71	2,35	3,87	5,70	1,30	3,73
Austria	2,07	0,93	2,24	3,55	3,41	2,15	3,33	3,48	1,29	2,93	2,61	1,79	4,72	3,28	2,65
Belgium	1,60	0,27	2,50	2,02	2,58	1,66	2,54	3,67	2,49	2,07	0,69	2,58	5,64	4,45	2,33
Bulgaria															
Canada	3,72	-1,98	4,45	4,97	1,33	3,15	4,69	-0,99	1,45	4,22	2,04	2,19	3,53	5,17	2,52
Croatia	5,38	-3,65	2,91	5,90	3,63	4,05	-1,93	4,88	2,81	2,72	2,94	0,87	-6,59		1,84
Cyprus	4,54	-0,70	3,68	1,63	1,90	-0,09	-1,39	0,56	0,40	2,38	1,98	2,27	0,85	4,65	1,39
Czech Republic	1,10	-2,49	5,02	1,88	3,92	1,55	1,36	2,70	0,27	2,25	0,88	2,30	6,80	5,16	2,12
Denmark	4,85	1,88	2,77	0,77	2,18	1,48	4,68	5,16	1,43	6,05	5,96	6,10	1,61	3,60	3,46
Estonia	3,14	0,88	6,62	4,07	7,21	5,57	5,78	0,78	4,57	7,21	11,63	6,81	4,68	6,46	5,30
Finland	2,49	-2,36	3,61	4,59	1,79	3,26	1,78	2,81	2,43	3,39	0,62	2,24	1,34	4,46	2,15
France	0,89	-1,09	2,21	2,65	1,63	2,43	-0,21	1,91	0,92	2,95	1,59	2,47	2,77	-0,49	1,62
Germany	0,89	-0,88	4,63	2,80	2,39	2,19	2,95	2,46	1,33	3,72	2,72	2,26	3,61	4,70	2,39
Greece	3,18	0,53	0,05	-2,75	-0,36	0,10	0,26	-1,82	-3,14	-0,97	-1,21	2,26	0,82	0,17	-0,24
Hungary	7,13	1,81	3,58	3,84	0,68	3,19	1,72	3,97	-0,62	7,54	10,39	9,31	6,78	6,84	4,56
Iceland	12,21	15,28	4,23	4,19	4,33	3,42	4,01	7,27	4,22	4,20	6,01	6,74	2,08	10,24	6,01
Ireland	-2,90	0,51	8,81	3,63	2,65	-1,12	5,08	29,30	-0,43	6,37	6,20	6,81	7,32	7,99	5,56
Italy	1,18	-0,30	2,85	2,24	0,88	1,81	0,67	0,81	0,88	1,38	1,15	1,34	3,77	1,47	1,43
Latvia	10,92	-7,75	2,57	6,96	10,15	1,99	4,36	4,66	3,54	7,07	5,58	7,11	4,08	12,50	4,71
Lithuania	6,45	9,74	11,16	5,43	3,27	5,06	3,87	1,86	0,53	6,34	1,42	3,38	10,07	9,04	5,27
Luxembourg	12,87	-20,08	2,32	9,81	1,98	4,27	1,05	-3,05	2,99	4,86	4,49	4,17	6,79	10,52	2,50
Malta	3,87	0,56	9,72	1,91	5,06	4,96	6,96	10,70	-3,02	8,60	-0,23	-1,47	-2,00	9,01	3,51
Netherlands	2,18	-2,94	3,48	1,69	0,44	1,58	1,51	1,71	0,52	2,10	2,61	2,71	0,18	3,31	1,37
New Zealand	1,89	5,27	3,33	3,81	3,03	3,62	0,30	2,84	1,30	2,78	2,54	2,67	2,03	6,42	2,72
Norway	7,07	-4,92	6,06	5,92	4,35	3,68	1,09	-1,66	-0,55	6,92	6,18	-0,78	-3,28	15,95	2,31
Poland	4,83	7,07	7,49	7,97	3,88	1,41	2,06	3,91	2,20	6,67	8,30	8,06	3,07	7,08	5,15
Portugal	2,27	0,83	3,71	2,60	0,56	3,43	-0,49	2,30	2,15	2,34	1,71	3,13	3,33	4,53	2,14
Romania	28,89	3,18	3,75	10,74	6,47	2,85	5,92	8,30	5,38	12,02	12,44	9,79	5,11		8,84
Slovak Republic	5,08	-3,19	8,03	5,19	2,22	2,10	1,72	2,65	-0,56	4,17	5,26	5,13	8,68	3,52	3,58
Slovenia	5,75	-3,21	1,72	6,24	0,30	1,43	0,83	2,81	6,58	3,37	5,81	5,40	1,64	7,39	2,98
Spain	3,18	2,91	2,97	0,51	2,10	2,25	-0,07	1,14	0,26	2,18	0,55	1,98	-0,87	0,28	1,47
Sweden	2,44	1,11	1,27	-0,51	1,42	1,26	0,14	-1,09	-0,86	-0,49	2,15	1,24	0,06	2,87	0,63
Switzerland	0,74	-2,47	11,16	2,31	0,16	2,44	3,21	4,26	2,12	5,22	4,04	4,04	3,38	6,01	3,12
United Kingdom	3,39	-0,55	4,26	2,15	0,79	2,66	1,53	2,50	1,50	3,63	2,22	2,58	7,16	-1,40	2,60
United States	3,05	3,33	3,92	2,67	2,08	2,67	2,42	1,91	1,18	2,94	3,55	3,21	5,60	5,80	2,96
Average	4,76	0,17	4,35	3,78	2,74	2,48	2,22	3,31	1,37	4,20	3,74	3,66	3,25	5,38	3,08

Source: OECD + Eurostat and author's calculation

Table 11: Gini Index

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Change	Average
Australia	..	35,4	..	34,7	..	..	..	34,4	..	33,7	..	34,3	..	1	34,5
Austria	30,6	30,4	31,5	30,3	30,8	30,5	30,8	30,5	30,5	30,8	29,7	30,8	30,2	0,2	30,6
Belgium	29,2	28,4	28,6	28,4	28,1	27,5	27,7	28,1	27,7	27,6	27,4	27,2	27,2	-2	27,9
Bulgaria	36,1	33,6	33,8	35,7	34,3	36	36,6	37,4	38,6	40,6	40,4	41,3	40,3	5,2	37,3
Canada	33,8	..	..	33,6	..	33,5	33,8	33,2	33,7	32,7	33,3	..	..	-0,3	33,5
Croatia	..	..	32,6	32,4	32,3	32,5	32	32,1	31,1	30,9	30,4	29,7	28,9	5,1	31,4
Cyprus	31,1	31,7	32,1	31,5	32,6	34,3	37	35,6	34	32,9	31,4	32,7	31,2	1,6	32,9
Czechia	26	26,3	26,2	26,6	26,4	26,1	26,5	25,9	25,9	25,4	24,9	25	25,3	-1	25,9
Denmark	26,2	25,2	26,7	27,2	27,3	27,8	28,5	28,4	28,2	28,2	28,7	28,2	27,7	2	27,6
Estonia	31,2	31,9	31,4	32	32,5	32,9	35,1	34,6	32,7	31,2	30,4	30,3	30,8	-0,9	32,1
Finland	28,3	27,8	27,5	27,7	27,6	27,1	27,2	26,8	27,1	27,1	27,4	27,3	27,7	-1	27,4
France	32,4	33	32,7	33,7	33,3	33,1	32,5	32,3	32,7	31,9	31,6	32,4	..	0	32,6
Germany	31,4	30,9	30,5	30,3	30,8	31,1	31,5	30,9	31,6	31,6	31,2	31,7	..	0,3	31,1
Greece	34	33,6	33,6	34,1	34,8	36,3	36,1	35,8	36	35	34,4	32,9	33,1	-1,1	34,6
Hungary	27,9	27,5	27	29,4	29,2	30,8	31,5	30,9	30,4	30,3	30,6	29,6	30	1,7	29,6
Iceland	29,5	31,8	28,7	26,2	26,8	26,8	25,4	27,8	26,8	27,2	26,1	..	..	-3,4	27,6
Ireland	31,9	30,9	32,7	32,3	32,9	33,2	33,5	31,9	31,8	32,8	31,4	30,6	..	-1,3	32,2
Italy	32,9	33,8	33,8	34,7	35,1	35,2	34,9	34,7	35,4	35,2	35,9	35,2	..	2,3	34,7
Latvia	37,5	37,2	36	35	35,8	35,2	35,5	35,1	34,2	34,3	35,6	35,1	34,5	-2,4	35,5
Lithuania	34,8	35,7	37,2	33,6	32,5	35,1	35,3	37,7	37,4	38,4	37,3	35,7	35,3	0,9	35,8
Luxembourg	31,1	32,6	31,2	30,5	32,1	34,3	32	31,2	32,9	31,7	34,5	35,4	34,2	4,3	32,6
Malta	29,2	29	30,2	29	29,1	29,4	28,8	29	29,4	29,1	29,2	28,7	31	-0,5	29,3
Netherlands	29,6	29,3	27,9	27,8	27,8	27,6	28,1	28,6	28,2	28,2	28,5	28,1	29,2	-1,5	28,4
New Zealand	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Norway	27,1	27	26,2	25,7	25,3	25,7	26,4	26,8	27,5	28,5	27	27,6	27,7	0,5	26,8
Poland	34	33,5	33,4	33,2	33,2	33	33,1	32,8	31,8	31,2	29,7	30,2	..	-3,8	32,4
Portugal	36,8	36,6	34,9	35,8	36,3	36	36,2	35,6	35,5	35,2	33,8	33,5	32,8	-3,3	35,3
Romania	37,5	36,4	35,6	35,5	35,9	36,5	36,9	36	35,9	34,4	36	35,8	34,8	-1,7	35,9
Slovak Republic	24,7	26	27,2	27,3	26,5	26,1	28,1	26,1	26,5	25,2	23,2	25	23,2	0,3	25,8
Slovenia	24,4	23,7	24,8	24,9	24,9	25,6	26,2	25,7	25,4	24,8	24,2	24,6	24,4	0,2	24,9
Spain	34,1	34,2	34,9	35,2	35,7	35,4	36,2	36,1	36,2	35,8	34,7	34,7	34,3	0,6	35,2
Sweden	27,1	28,1	27,3	27,7	27,6	27,6	28,8	28,4	29,2	29,6	28,8	30	29,3	2,9	28,4
Switzerland	34,3	33,8	32,9	32,6	31,7	31,6	32,5	32,5	32,3	33	32,7	33,1	..	-1,2	32,8
United Kingdom	35,7	34,1	34,3	34,4	33,2	32,3	33,2	34	33,2	34,8	35,1	..	..	0,6	34,0
United States	40,8	40,8	40,6	40	40,9	40,9	40,7	41,5	41,2	41,1	41,2	41,4	41,5	0,6	41,0
Average	31,6	31,6	31,4	31,4	31,4	31,7	32,1	32,0	31,8	31,8	31,4	31,6	31,0	0,0	31,6

Source: World Development Indicators and author's calculation

Table 12: Wage share (in percent of GDP)

Country	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average	Change
Australia	61,40	61,40	61,01	60,35	61,35	62,10	59,34	59,17	58,42	59,61	60,42	-1,79
Austria	58,54	57,44	57,95	57,94	60,74	58,93	61,03	60,17	58,31	59,24	59,03	0,70
Belgium	65,18	65,69	66,35	67,32	64,71	63,85	62,53	61,61	61,55	61,86	64,07	-3,32
Bulgaria	44,28	42,52	45,64	50,02	50,59	50,65	51,35	53,01	51,98	51,73	49,18	7,45
Canada	61,18	60,14	60,99	61,13	60,19	62,26	61,05	60,02	60,58	60,83	60,84	-0,35
Croatia	60,98	59,85	59,29	58,40	56,56	58,31	55,98	54,83	57,38	57,82	57,94	-3,16
Cyprus	57,14	57,52	56,14	53,98	51,98	49,57	48,09	48,44	49,16	49,74	52,18	-7,40
Czechia	54,24	53,44	54,93	53,92	53,35	51,66	52,57	54,82	56,32	56,43	54,17	2,19
Denmark	59,94	60,84	59,80	59,30	58,75	58,57	58,01	56,69	56,46	56,19	58,46	-3,75
Estonia	52,02	50,74	51,34	52,46	54,10	56,48	54,59	56,73	56,99	58,34	54,38	6,32
Finland	59,53	58,66	58,48	58,14	57,15	57,61	55,81	53,94	54,22	54,57	56,81	-4,96
France	63,33	63,00	62,27	61,61	63,38	62,10	61,80	59,82	60,12	59,30	61,67	-4,03
Germany	61,70	61,15	62,06	62,22	61,92	62,15	61,66	61,92	62,60	63,22	62,06	1,52
Greece	58,05	59,71	59,25	56,19	55,97	53,05	54,38	54,29	56,44	55,88	56,32	-2,17
Hungary	51,18	50,73	51,87	50,58	49,61	48,42	49,52	49,43	49,60	48,89	49,98	-2,29
Iceland	57,35	60,60	62,36	63,37	63,54	61,36	60,87	61,11	61,06	61,30	61,29	3,95
Ireland	52,69	50,08	49,19	49,11	46,94	36,81	38,01	36,37	35,32	34,55	42,91	-18,14
Italy	59,15	57,72	57,79	57,89	57,35	58,04	60,05	61,51	61,69	61,84	59,30	2,69
Latvia	49,31	44,70	45,28	47,95	49,29	51,66	52,99	54,40	54,96	56,95	50,75	7,64
Lithuania	45,77	43,89	42,97	44,63	44,22	47,66	47,81	50,26	50,86	52,73	47,08	6,96
Luxembourg	54,84	53,47	55,19	54,19	53,28	54,75	53,41	55,02	55,66	55,82	54,56	0,98
Malta	48,60	50,92	50,74	51,06	49,06	47,44	49,51	48,66	49,60	50,87	49,65	2,27
Netherlands	65,35	65,41	64,76	65,18	65,51	63,10	63,65	62,24	61,42	61,47	63,81	-3,88
New Zealand	51,17	50,87	51,58	49,45	49,64	49,46	51,36	51,40	51,62	52,11	50,87	0,94
Norway	49,10	46,89	46,74	48,65	50,28	51,99	53,78	51,73	50,19	52,94	50,23	3,84
Poland	47,97	46,47	47,10	46,82	47,28	46,61	48,85	47,59	49,06	49,28	47,70	1,31
Portugal	62,24	59,87	59,63	59,20	56,73	54,47	53,87	55,06	54,72	55,03	57,08	-7,21
Romania	43,96	40,12	40,31	39,65	39,92	40,33	44,12	43,56	44,24	43,87	42,01	-0,09
Slovakia	46,15	46,73	45,06	48,08	48,41	48,50	49,97	51,10	51,93	53,42	48,94	7,27
Slovenia	61,21	58,78	59,37	60,27	59,34	58,48	58,97	57,30	57,43	58,04	58,92	-3,17
Spain	64,04	62,60	61,46	59,00	58,33	59,35	58,16	56,79	56,79	57,29	59,38	-6,75
Sweden	53,68	53,53	57,34	57,96	56,77	55,35	55,24	54,48	54,73	54,74	55,38	1,06
Switzerland	66,26	66,57	67,91	68,72	68,64	68,58	68,38	68,89	67,78	68,81	68,05	2,55
United Kingdom	59,34	58,18	57,60	57,67	57,49	56,43	56,58	56,78	56,48	57,43	57,40	-1,91
United States	58,76	58,67	58,52	58,02	58,14	58,59	58,44	58,41	58,26	58,15	58,40	-0,61
Average	56,16	55,40	55,66	55,73	55,44	54,99	55,19	55,07	55,26	55,72	55,46	-0,44

Source: ILO and author's calculation

Table 13: Wealth distribution (share of top ten in %)

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2007-2021
Australia	55,91	55,75	55,88	55,89	55,93	56,29	56,55	56,56	56,35	56,16	56,55	56,72	56,67	56,50	57,06	1,15
Austria	61,32	61,53	61,13	61,27	60,88	60,78	60,63	60,43	60,72	60,73	61,24	61,42	61,42	61,33	61,85	0,53
Belgium	52,93	52,70	52,43	52,66	52,27	51,06	50,50	50,88	51,66	51,81	52,11	52,11	52,18	52,09	52,19	-0,74
Bulgaria	56,33	56,20	56,63	56,60	56,63	57,02	56,76	57,08	57,35	57,85	58,58	58,68	58,66	58,66	58,66	2,33
Canada	58,48	58,33	57,64	57,95	58,05	57,88	58,12	58,27	58,38	57,79	58,18	58,22	58,16	58,01	58,33	-0,15
Croatia	56,71	56,55	56,25	56,14	56,29	56,32	56,37	56,27	56,12	56,15	51,17	56,04	56,04	56,04	56,04	-0,67
Cyprus	54,58	54,99	54,59	54,78	55,19	55,63	56,01	56,60	60,51	63,84	66,54	66,48	66,45	66,42	66,38	11,80
Czech Republic	56,19	56,71	56,05	56,45	56,60	56,62	56,86	57,25	56,94	56,97	57,39	57,83	57,93	57,90	58,47	2,28
Denmark	51,11	48,96	50,92	51,07	50,13	49,42	49,98	50,48	50,21	50,30	50,50	50,40	50,14	50,16	50,74	-0,37
Estonia	66,74	66,45	65,77	66,09	66,36	66,55	66,64	66,65	65,56	65,34	66,03	66,50	66,42	66,42	66,42	-0,32
Finland	55,88	53,71	53,92	55,16	54,60	54,19	54,81	54,78	54,98	55,41	55,88	55,92	55,76	55,76	56,06	0,18
France	56,60	56,11	56,57	58,26	57,60	57,13	57,77	58,53	58,72	58,54	58,63	58,90	58,90	58,77	59,33	2,73
Germany	60,06	60,52	59,65	59,09	58,75	58,24	58,33	58,71	58,74	58,77	58,70	59,06	58,73	58,54	58,94	-1,12
Greece	49,42	49,34	48,32	50,50	51,75	54,44	58,01	59,42	59,07	58,45	60,03	60,36	60,39	60,05	60,74	11,32
Hungary	60,18	59,96	59,71	59,80	59,65	59,44	59,73	59,62	61,88	64,75	67,16	67,25	67,26	67,26	67,26	7,08
Iceland	59,63	58,93	56,08	55,57	55,58	55,59	55,70	55,69	56,11	56,16	56,14	56,11	56,11	56,14	56,68	-2,95
Ireland	70,00	69,63	69,24	69,57	69,80	69,66	69,90	72,16	71,34	68,98	68,13	66,34	66,25	65,85	66,02	-3,98
Italy	54,97	54,61	55,65	57,35	58,08	59,48	58,36	58,54	56,55	56,08	56,21	56,20	56,19	56,19	56,19	1,22
Latvia	65,59	65,42	65,53	65,12	65,67	65,53	65,49	65,30	64,26	62,51	60,98	60,48	60,57	60,57	60,57	-5,02
Lithuania	57,04	57,10	57,13	56,53	56,53	57,18	57,21	58,21	57,40	57,08	57,31	55,45	57,42	57,43	57,43	0,39
Luxembourg	61,82	61,60	60,50	61,22	62,32	63,67	64,12	64,79	63,29	61,58	60,86	59,29	59,34	59,34	59,34	-2,48
Malta	44,17	44,21	44,35	44,21	44,48	45,23	45,56	46,57	48,32	51,13	53,83	53,78	53,82	53,82	53,82	9,65
Netherlands	49,67	48,94	48,77	50,66	50,52	51,27	54,53	53,58	52,00	50,77	52,34	49,44	47,74	47,69	47,88	-1,79
New Zealand	55,82	55,98	55,99	56,17	56,49	56,89	56,44	56,45	56,48	56,35	56,61	56,66	56,62	56,65	56,59	0,77
Norway	51,44	51,56	50,91	51,21	50,50	48,79	49,08	48,44	49,06	49,18	50,07	51,14	52,27	52,21	52,21	0,77
Poland	61,53	61,69	60,96	61,13	61,33	61,22	61,26	61,55	62,08	61,61	61,57	61,66	61,56	61,55	61,78	0,25
Portugal	58,98	59,01	58,67	58,71	59,34	59,43	59,64	59,39	59,43	59,67	60,89	60,45	60,60	60,58	60,69	1,71
Romania	59,22	59,34	59,12	57,99	57,82	58,10	57,80	58,21	58,20	57,38	57,44	57,49	57,45	57,45	57,72	-1,50
Slovakia	42,08	42,05	42,04	42,11	42,59	44,24	46,00	47,43	48,50	48,61	49,20	49,42	49,67	49,67	49,72	7,64
Slovenia	48,10	48,09	48,02	48,03	50,30	52,89	55,03	56,68	56,60	56,95	57,18	57,24	57,22	57,23	57,23	9,13
Spain	55,96	54,42	55,94	55,72	56,11	56,72	56,81	58,27	57,48	57,45	57,62	57,57	57,46	57,38	57,58	1,62
Sweden	60,01	59,76	58,63	59,44	58,92	58,83	59,14	59,22	59,29	59,13	59,14	59,03	58,96	58,19	58,87	-1,14
Switzerland	59,44	59,04	59,05	59,41	59,64	60,01	60,77	61,59	62,13	62,33	62,67	62,76	62,49	62,28	62,66	3,22
USA	68,43	69,44	69,69	70,88	71,71	72,56	72,88	72,85	72,67	72,24	70,84	70,68	70,67	70,67	70,68	2,25
United Kingdom	54,44	53,79	54,36	54,59	55,80	55,67	56,74	57,82	56,67	57,13	57,50	57,09	57,03	56,97	57,13	2,69
Average	56,88	56,64	56,46	56,78	56,98	57,26	57,70	58,12	58,14	58,15	58,43	58,40	58,42	58,34	58,55	1,67

Source: World Inequality Database (WID) and author's calculation

Table 14: Unemployment rate (in%)

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average	2007-2013
Australia	4,4	4,2	5,6	5,2	5,1	5,2	5,7	6,1	6,1	5,7	5,6	5,3	5,2	6,5	5,1	5,4	1,3
Austria	4,9	4,1	5,3	4,8	4,6	4,9	5,3	5,6	5,7	6,0	5,5	4,8	4,5	5,4	6,3	5,2	0,5
Belgium	7,5	7,0	7,9	8,3	7,1	7,5	8,4	8,5	8,5	7,8	7,1	5,9	5,4	5,6	6,4	7,3	1,0
Bulgaria	6,9	5,6	6,8	10,3	11,3	12,3	12,9	11,4	9,1	7,6	6,2	5,2	4,2	5,1	5,4	8,0	6,1
Canada	6,0	6,1	8,3	8,1	7,5	7,3	7,1	6,9	6,9	7,0	6,3	5,8	5,7	9,5	7,5	7,1	1,0
Croatia	9,9	8,5	9,2	11,6	13,7	15,9	17,3	17,3	16,2	13,1	11,2	8,4	6,6	7,5	8,7	11,7	7,3
Cyprus	3,9	3,7	5,4	6,3	7,9	11,8	15,9	16,1	14,9	12,9	11,1	8,4	7,1	7,6	6,1	9,3	11,9
Czechia	5,3	4,4	6,7	7,3	6,7	7,0	6,9	6,1	5,1	4,0	2,9	2,2	2,0	2,5	2,9	4,8	1,6
Denmark	3,8	3,7	6,4	7,8	7,8	7,8	7,4	6,9	6,3	6,0	5,8	5,1	5,0	5,6	4,8	6,0	3,6
Estonia	4,6	5,4	13,6	16,7	12,3	10,0	8,6	7,3	6,2	6,8	5,8	5,4	4,4	6,8	6,3	8,0	4,0
Finland	6,8	6,4	8,3	8,4	7,8	7,7	8,2	8,7	9,4	8,8	8,6	7,4	6,7	7,8	7,5	7,9	1,3
France	7,7	7,1	8,7	8,9	8,8	9,4	9,9	10,3	10,4	10,1	9,4	9,0	8,4	8,0	8,1	8,9	2,3
Germany	8,7	7,5	7,7	7,0	5,8	5,4	5,2	5,0	4,6	4,1	3,8	3,4	3,1	3,8	3,5	5,2	-3,4
Greece	8,4	7,8	9,6	12,7	17,9	24,4	27,5	26,5	24,9	23,5	21,5	19,3	17,3	16,3	14,8	18,2	19,1
Hungary	7,4	7,8	10,0	11,2	11,0	11,0	10,2	7,7	6,8	5,1	4,2	3,7	3,4	4,3	4,1	7,2	2,8
Iceland	2,3	3,0	7,2	7,6	7,0	6,0	5,4	4,9	4,0	3,0	2,7	2,7	3,5	5,5	5,4	4,7	3,1
Ireland	5,0	6,8	12,6	14,5	15,4	15,4	13,7	11,9	9,9	8,4	6,7	5,7	4,9	5,6	6,6	9,5	8,7
Italy	6,1	6,7	7,8	8,4	8,4	10,6	12,1	12,7	11,9	11,7	11,2	10,6	9,9	9,2	9,8	9,8	6,1
Latvia	6,1	7,7	17,5	19,5	16,2	15,1	11,9	10,9	9,9	9,6	8,7	7,4	6,3	8,1	7,6	10,8	5,8
Lithuania	4,3	5,8	13,8	17,8	15,4	13,4	11,8	10,7	9,1	7,9	7,1	6,2	6,3	8,5	7,9	9,7	7,5
Luxembourg	4,1	5,1	5,1	4,4	4,9	5,1	5,8	5,8	6,7	6,3	5,5	5,6	5,6	6,8	5,2	5,5	1,8
Malta	6,5	6,0	6,9	6,8	6,4	6,2	6,1	5,7	5,4	4,7	4,0	3,7	3,6	4,3	3,5	5,3	-0,4
Netherlands	4,2	3,7	4,3	5,0	5,0	5,8	7,2	7,4	6,9	6,0	4,8	3,8	3,4	3,8	4,0	5,0	3,1
New Zealand	3,7	4,2	6,1	6,6	6,5	6,9	5,8	5,4	5,4	5,2	4,7	4,3	4,1	4,6	4,1	5,2	2,2
Norway	2,5	2,5	3,1	3,5	3,2	3,1	3,4	3,5	4,3	4,7	4,2	3,8	3,7	4,4	5,0	3,7	0,9
Poland	9,6	7,1	8,2	9,6	9,6	10,1	10,3	9,0	7,5	6,2	4,9	3,8	3,3	3,2	3,4	7,1	0,7
Portugal	8,0	7,6	9,4	10,8	12,7	15,5	16,2	13,9	12,4	11,1	8,9	7,0	6,5	6,8	6,6	10,2	8,2
Romania	6,4	5,8	6,9	7,0	7,2	6,8	7,1	6,8	6,8	5,9	4,9	4,2	3,9	5,0	5,2	6,0	0,7
Slovak Republic	11,1	9,5	12,0	14,4	13,6	14,0	14,2	13,2	11,5	9,7	8,1	6,5	5,8	6,7	6,7	10,5	3,1
Slovenia	4,8	4,4	5,9	7,2	8,2	8,8	10,1	9,7	9,0	8,0	6,6	5,1	4,4	5,0	4,4	6,8	5,3
Spain	8,2	11,3	17,9	19,9	21,4	24,8	26,1	24,4	22,1	19,6	17,2	15,3	14,1	15,5	14,7	18,2	17,9
Sweden	6,2	6,2	8,4	8,6	7,8	8,0	8,1	7,9	7,4	7,0	6,7	6,4	6,8	8,3	8,7	7,5	1,9
Switzerland	3,7	3,3	4,1	4,8	4,4	4,5	4,8	4,8	4,8	4,9	4,8	4,7	4,4	4,8	5,3	4,5	1,1
United Kingdom	5,3	5,6	7,5	7,8	8,0	7,9	7,5	6,1	5,3	4,8	4,3	4,0	3,7	4,5	4,5	5,8	2,3
United States	4,6	5,8	9,3	9,6	8,9	8,1	7,4	6,2	5,3	4,9	4,4	3,9	3,7	8,1	5,5	6,4	2,8
Average	6,0	6,0	8,6	9,6	9,6	10,1	10,3	9,7	8,9	8,1	7,1	6,2	5,7	6,6	6,4	7,9	4,3

Source: World Development Indicators and author's calculation

Table 15: Number of hours worked per employee and year

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2020-2017
Australia	1449	1449	1424	1435	1434	1432	1428	1420	1417	1407	1408	1405	1399	1367	1381	-82
Austria	1332	1330	1299	1297	1302	1287	1276	1269	1253	1265	1254	1257	1262	1174	1218	-158
Belgium	1325	1315	1300	1308	1315	1313	1313	1310	1303	1301	1286	1290	1288	1181	1231	-144
Canada	1399	1400	1381	1386	1388	1397	1393	1389	1392	1385	1377	1389	1377	1342	1378	-57
Croatia	1608	1612	1612	1625	1624	1613	1602	1589	1535	1543	1547	1555	1607	1608	0	0
Cyprus	1092	1115	1113	1101	1119	1120	1080	1048	1070	1113	1119	1113	1128	1060	1088	-33
Czech Republic	1525	1541	1534	1549	1542	1515	1502	1505	1484	1499	1497	1501	1500	1431	1501	-94
Denmark	1164	1165	1158	1165	1180	1172	1177	1171	1167	1174	1169	1151	1146	1122	1141	-42
Estonia	1616	1591	1479	1511	1545	1514	1495	1487	1474	1477	1473	1422	1410	1363	1463	-252
Finland	1326	1325	1310	1317	1311	1304	1298	1297	1295	1296	1293	1293	1289	1284	1267	-42
France	1182	1186	1176	1183	1188	1184	1173	1200	1202	1208	1198	1204	1207	1121	1193	-61
Germany	1243	1240	1204	1199	1218	1205	1197	1201	1202	1196	1188	1182	1175	1125	1137	-118
Greece	1705	1700	1675	1632	1646	1684	1695	1661	1654	1661	1662	1670	1627	1469	1606	-236
Hungary	1489	1493	1466	1474	1466	1459	1455	1467	1463	1477	1464	1448	1442	1391	1430	-98
Iceland	1206	1228	1158	1150	1158	1141	1148	1132	1135	1144	1142	1149	1150	1124	1213	-82
Ireland	1487	1469	1437	1358	1365	1363	1367	1378	1391	1387	1401	1410	1407	1393	1445	-95
Italy	1555	1548	1525	1528	1529	1498	1478	1468	1473	1478	1478	1480	1489	1359	1458	-197
Latvia	1523	1494	1460	1448	1456	1435	1430	1424	1392	1389	1369	1378	1352	1307	1331	-215
Lithuania	1420	1449	1405	1464	1427	1428	1416	1410	1430	1447	1409	1414	1412	1353	1384	-67
Luxembourg	1247	1231	1200	1200	1203	1208	1183	1180	1226	1231	1227	1229	1227	1162	1127	-85
Malta	1796	1825	1828	1785	1740	1705	1677	1650	1643	1703	1681	1696	1752	1616	1644	-180
Netherlands	1155	1157	1151	1150	1150	1148	1158	1168	1168	1181	1185	1186	1190	1167	1169	12
New Zealand	1382	1374	1361	1375	1371	1363	1378	1383	1385	1392	1397	1404	1427	1391	1403	9
Norway	1148	1158	1143	1154	1164	1165	1160	1163	1168	1172	1164	1163	1165	1161	1174	13
Poland	1527	1520	1512	1488	1486	1484	1482	1485	1491	1481	1459	1432	1422	1413	1466	-115
Portugal	1480	1472	1474	1480	1465	1453	1463	1473	1482	1491	1484	1496	1502	1393	1424	-87
Romania	1631	1629	1585	1554	1558	1534	1529	1520	1512	1531	1506	1505	1520	1477	0	-154
Slovak Republic	1502	1512	1510	1536	1515	1512	1499	1490	1485	1472	1448	1437	1425	1323	1322	-180
Slovenia	1422	1450	1442	1444	1426	1408	1420	1435	1438	1406	1379	1355	1358	1300	1329	-122
Spain	1440	1446	1447	1435	1437	1423	1416	1417	1421	1427	1421	1428	1419	1328	1398	-112
Sweden	1215	1225	1216	1240	1243	1233	1220	1224	1221	1227	1221	1218	1209	1182	1199	-33
Switzerland	1398	1392	1391	1358	1355	1344	1327	1321	1331	1330	1313	1305	1303	1261	1298	-137
United Kingdom	1247	1234	1227	1221	1228	1240	1241	1247	1233	1245	1238	1238	1239	1102	1208	-145
United States	1405	1396	1376	1385	1390	1403	1405	1409	1415	1417	1415	1426	1423	1407	1434	3
Average	1401	1402	1382	1380	1381	1373	1367	1364	1363	1369	1361	1360	1360	1302	1249	-100

Source WDI, OECD and Eurostat and author's calculation

Table 16: Growth of gross national income (in %)

Country	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average
Australia	5,16	3,98	0,94	6,32	5,06	0,99	1,65	0,41	0,26	4,80	2,87	3,24	1,26	5,71	3,05
Austria	1,81	-3,93	1,75	1,46	0,01	0,09	0,97	0,61	3,42	0,70	2,20	1,73	-5,05	3,48	0,66
Belgium	-0,61	-0,58	1,27	-0,81	2,92	0,89	1,47	2,11	1,47	1,17	1,11	2,95	-4,73	4,77	0,96
Bulgaria	8,90	-1,92	2,68	0,96	2,65	-1,42	2,32	1,07	2,98	3,69	1,60	4,45	-4,73	8,68	2,28
Canada	2,46	-6,15	4,45	4,25	1,42	2,80	2,28	-1,55	0,97	4,18	2,39	2,08	-6,05	9,22	1,62
Croatia	1,03	-7,66	-0,90	0,05	-2,45	1,07	0,01	4,63	1,20	5,01	2,61	3,94	-6,35	11,26	0,96
Cyprus	8,97	-0,66	1,13	4,51	-6,55	-7,05	-3,24	5,54	2,94	6,91	4,94	3,49	-5,92	4,93	1,42
Czechia	2,08	-4,44	0,51	0,07	0,64	0,86	2,98	5,57	3,19	5,36	3,21	2,63	-3,62	4,01	1,65
Denmark	1,07	-5,33	4,05	0,89	0,69	2,35	2,76	2,00	2,22	2,64	2,24	1,61	-0,59	5,76	1,60
Estonia	-1,81	-11,62	-0,33	8,54	4,49	4,33	3,77	2,81	3,99	5,43	5,00	3,58	0,69	9,46	2,74
Finland	-0,42	-6,92	2,71	0,90	-1,69	-0,58	0,74	1,69	2,21	2,59	1,76	1,11	-0,88	3,52	0,48
France	0,25	-2,05	1,56	1,78	-0,25	0,99	1,29	2,11	1,37	2,01	1,55	1,96	-8,02	8,12	0,91
Germany	-0,21	-3,14	3,13	3,44	0,22	0,66	2,32	2,70	3,03	2,23	1,55	1,26	-3,45	2,18	1,14
Greece	-1,08	-3,35	-4,85	-11,16	-4,17	-2,85	1,71	0,62	-0,47	0,75	0,16	1,86	-8,41	7,21	-1,72
Hungary	1,36	-3,90	0,70	0,64	-1,42	3,47	2,90	3,80	4,78	2,24	4,57	6,41	-2,76	3,59	1,88
Iceland															
Ireland	-4,43	-7,71	1,60	-2,12	0,31	6,12	7,60	20,61	7,89	5,32	5,01	6,13	2,09	11,59	4,29
Italy	-2,60	-3,12	0,48	-0,08	-3,23	-1,47	0,85	0,68	3,14	1,54	1,33	0,48	-7,85	6,04	-0,27
Latvia	-1,98	-7,14	-9,80	3,22	4,50	2,88	1,77	3,65	4,60	3,48	3,75	3,30	0,87	3,04	1,15
Lithuania	5,41	-11,99	-1,01	2,88	2,94	4,24	5,22	1,45	3,74	4,23	3,38	4,83	1,12	0,52	1,93
Luxembourg	-4,78	-20,76	13,82	3,84	13,57	-2,86	5,58	-8,94	6,06	9,40	1,52	-4,48	4,53	10,54	1,93
Malta	7,41	-4,72	5,62	3,36	1,72	5,16	7,29	9,11	-1,37	10,55	9,32	5,79	-9,68	12,91	4,46
Netherlands	-1,59	-2,57	3,51	1,42	-1,69	0,33	0,78	2,69	0,81	4,23	3,00	0,45	-5,11	5,22	0,82
New Zealand	-2,19	3,68	2,23	3,57	1,61	5,51	3,45	4,26	4,65	4,99	3,38	4,38	-0,04	3,49	3,07
Norway	5,76	-8,52	3,55	4,50	3,43	1,14	1,72	-1,97	-2,08	3,31	4,60	-2,96	-5,85	15,88	1,61
Poland	5,62	1,75	2,72	4,85	1,29	1,01	3,62	4,41	2,80	4,74	5,99	4,46	-1,68	5,87	3,39
Portugal	-1,13	-1,11	1,24	-0,99	-4,60	0,81	0,57	2,46	2,93	3,27	2,52	2,87	-6,67	5,13	0,52
Romania	12,86	-4,54	-3,79	4,45	1,43	0,47	5,29	2,48	2,51	8,09	5,54	4,33	-3,84	4,93	2,87
Slovak Republic	5,33	-5,09	4,40	0,14	2,03	1,01	2,18	3,48	1,34	3,31	3,68	1,42	-2,59	2,17	1,63
Slovenia	2,33	-4,79	-0,79	-0,07	-3,56	-0,32	3,95	0,84	4,22	5,21	4,77	3,65	-3,22	5,69	1,28
Spain	0,07	-1,79	-0,13	-2,10	-2,27	-0,89	1,39	4,36	3,39	2,64	2,19	1,94	-10,69	5,58	0,26
Sweden	-0,10	-5,01	6,08	2,10	-0,46	1,07	2,57	3,43	1,90	3,38	1,64	3,19	-1,47	4,80	1,65
Switzerland	-4,66	7,20	7,76	-2,32	2,45	0,83	0,43	3,16	-0,99	-0,29	0,08	1,64	-4,14	..	0,86
United Kingdom	-1,44	-3,23	3,44	0,97	0,28	1,53	3,80	2,74	1,93	3,29	1,42	3,17	-12,57	9,24	1,04
United States	-1,68	-1,54	3,64	2,00	3,40	1,59	3,23	3,10	1,21	2,64	2,89	2,35	-2,55	5,57	1,85
Average	1,39	-4,08	1,86	1,51	0,73	1,02	2,51	2,83	2,42	3,91	3,05	2,62	-3,76	6,37	1,60

Source: WDI and author's calculation

Table 17: Growth of net wealth per adult (in%)

Country	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Australia	1,72	-5,50	2,52	-1,24	-3,26	1,34	4,69	6,04	3,53	2,79	3,14	-1,58	0,55	2,14
Austria	1,11	-1,60	2,97	0,91	-0,26	0,90	0,61	-0,47	1,23	2,83	2,98	2,54	-4,12	6,07
Belgium	0,21	-1,16	2,74	0,66	0,45	0,81	1,45	1,65	0,86	0,73	0,05	0,67	-0,84	6,20
Bulgaria	9,76	2,79	2,97	-0,75	4,16	3,00	2,55	1,42	2,90	1,12	0,81	3,26	-1,88	10,73
Canada	-4,78	1,28	5,40	1,27	0,88	4,90	6,53	5,28	4,42	4,42	1,32	2,92	5,95	4,81
Croatia	-0,15	-7,28	-0,76	0,39	-1,12	1,41	0,42	3,99	3,19	5,27	4,05	5,66	-8,03	16,32
Cyprus	0,43	-2,78	-5,16	-4,97	-8,38	-5,67	-2,26	2,55	1,78	2,89	7,03	9,35	-3,40	5,66
Czech Republic	3,44	-1,69	1,54	2,29	-0,37	-0,77	-0,43	2,51	3,15	3,53	2,91	2,63	2,81	3,58
Denmark	-4,34	-6,64	-1,95	-1,72	-2,41	3,11	4,07	6,96	3,33	9,15	7,25	-9,96	18,05	7,20
Estonia														
Finland	-1,77	-3,52	3,45	-0,91	-1,06	2,62	2,36	0,35	1,27	1,98	0,58	2,19	1,15	2,98
France	-4,02	-4,92	2,94	2,02	-1,41	-1,01	-1,58	-1,63	1,95	3,67	2,33	3,07	3,04	5,63
Germany	2,06	-0,76	1,58	0,85	2,94	4,96	5,35	5,94	6,58	7,01	6,12	4,95	-3,35	2,56
Greece	-3,85	-6,51	-10,28	-9,45	-4,64	-3,95	1,19	-3,38	-2,83	1,11	0,17	1,81	-11,18	11,84
Hungary	0,79	-3,16	-0,17	0,82	-3,31	3,44	6,84	7,85	8,46	5,12	7,94	6,93	-4,10	9,04
Iceland	-23,57	-17,76	-1,62	5,19	6,04	11,38	0,23	7,76	8,61	5,38	5,22	-1,29	-10,49	3,74
Ireland	-1,56	-7,87	-13,17	-16,73	-10,56	1,88	10,22	0,03	5,74	6,22	6,06	3,31	24,18	16,35
Italy	-1,34	-2,19	-0,70	-0,75	-1,27	-2,77	-3,03	-2,54	-2,13	-0,71	-1,53	-1,06	-1,10	8,08
Latvia	1,40	-5,13	-14,54	3,00	9,58	5,76	2,33	5,48	5,64	5,38	4,81	4,76	-2,33	6,04
Lithuania	7,78	-8,52	8,08	-9,05	-11,26	32,12	6,52	4,40	31,08	6,15	6,87	-1,26	-8,16	7,58
Luxembourg	-11,34	0,99	4,73	-6,49	-2,51	-4,96	1,34	2,08	2,87	-0,91	-3,28	-21,68	-7,77	5,44
Malta	1,53	-5,09	2,48	-0,70	0,08	1,44	4,06	5,53	-0,55	5,69	4,52	0,82	-9,90	5,93
Netherlands	2,82	1,64	-2,34	1,37	-0,10	-3,22	0,74	4,60	3,60	3,01	2,04	5,41	7,48	6,79
New Zealand	-2,39	-1,87	-2,82	0,29	0,59	2,59	3,44	6,13	5,73	4,38	-0,42	2,96	-3,58	2,68
Norway	0,77	2,35	5,09	4,04	2,94	7,85	11,83	13,77	7,91	2,30	-2,43	3,93	9,57	3,51
Poland	4,67	-0,37	2,45	3,15	1,79	3,50	4,45	5,36	5,78	5,87	6,64	7,09	0,72	9,27
Portugal	-0,25	-3,06	0,02	-0,55	-5,82	-2,87	2,01	2,16	1,47	3,11	3,80	-2,96	-7,98	6,86
Romania	5,18	-6,41	-7,56	1,28	1,58	1,45	6,19	4,86	5,19	9,14	5,73	10,10	-3,61	6,48
Slovakia	7,99	-0,94	0,99	-0,04	1,04	-0,06	0,98	2,76	3,19	2,54	3,59	2,35	-3,79	3,65
Slovenia	1,07	-6,15	0,39	-1,48	-3,53	-2,68	0,39	-1,33	1,73	3,71	3,65	2,36	-11,66	9,83
Spain	-0,78	-8,52	0,14	-1,87	-7,21	-4,34	-0,76	0,38	2,22	0,91	1,10	0,18	-13,20	6,67
Sweden	-3,12	7,29	5,09	-1,95	3,39	7,56	8,60	7,04	7,11	4,21	1,26	9,44	1,88	6,17
Switzerland	4,64	-3,26	-0,08	4,15	3,49	3,65	6,03	5,17	1,45	4,34	3,76	1,29	5,00	4,65
United Kingdom	-7,25	-7,50	-0,94	-1,02	-0,90	0,62	3,91	5,63	2,80	2,77	0,16	-0,79	-10,72	8,48
USA	-11,65	-13,70	-0,18	-0,60	0,21	8,43	7,29	4,18	2,25	6,44	1,52	3,67	10,30	8,85

Source: WID and author's calculation.

Table 18: Life expectancy (in years)

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average	2007-2020
Australia	81,29	81,40	81,54	81,70	81,90	82,05	82,15	82,30	82,40	82,45	82,50	82,75	82,90	83,20	82,18	1,91
Austria	80,18	80,43	80,33	80,58	80,98	80,94	81,14	81,49	81,19	81,64	81,64	81,69	81,90	81,19	81,09	1,01
Belgium	79,78	79,68	80,03	80,18	80,59	80,39	80,59	81,29	80,99	81,44	81,49	81,60	82,00	80,80	80,77	1,01
Bulgaria	72,66	72,96	73,41	73,51	74,16	74,31	74,86	74,47	74,61	74,81	74,81	74,96	75,11	73,61	74,16	0,94
Canada	80,54	80,70	81,00	81,25	81,45	81,65	81,75	81,80	81,90	81,90	81,90	82,05	82,05	81,75	81,55	1,20
Croatia	75,71	75,91	76,17	76,48	76,78	76,92	77,13	77,48	77,28	78,02	77,83	78,07	78,42	77,72	77,14	2,02
Cyprus	78,81	78,98	79,40	79,67	80,00	80,11	80,40	80,77	80,97	81,06	81,33	81,38	81,40	81,39	80,40	2,58
Czechia	76,72	76,98	77,08	77,42	77,87	78,08	78,18	78,82	78,58	79,03	78,98	79,03	79,23	78,23	78,16	1,50
Denmark	78,20	78,45	78,60	79,10	79,80	80,05	80,30	80,70	80,70	80,85	81,10	80,95	81,45	81,55	80,13	3,36
Estonia	72,81	73,77	74,82	75,43	76,23	76,33	77,14	77,03	77,59	77,64	78,09	78,24	78,65	78,35	76,58	5,53
Finland	79,26	79,57	79,72	79,87	80,47	80,63	80,98	81,18	81,48	81,43	81,63	81,73	81,98	82,13	80,86	2,87
France	81,11	81,21	81,41	81,66	82,11	81,97	82,22	82,72	82,32	82,57	82,58	82,68	82,83	82,18	82,11	1,06
Germany	79,53	79,74	79,84	79,99	80,44	80,54	80,49	81,09	80,64	80,99	80,99	80,89	81,29	80,94	80,53	1,41
Greece	79,44	79,94	80,19	80,39	80,73	80,63	81,29	81,39	81,04	81,39	81,29	81,79	81,64	81,09	80,87	1,65
Hungary	73,15	73,70	73,90	74,21	74,86	75,06	75,57	75,76	75,57	76,06	75,82	76,07	76,32	75,62	75,12	2,47
Iceland	81,45	81,61	81,75	81,90	82,36	82,92	82,06	82,86	82,47	82,20	82,66	82,86	83,16	83,07	82,38	1,61
Ireland	79,64	80,10	80,19	80,74	80,75	80,85	80,95	81,35	81,45	81,65	82,16	82,20	82,70	82,20	81,21	2,56
Italy	81,43	81,49	81,64	82,04	82,19	82,24	82,69	83,09	82,54	83,24	82,95	83,35	83,50	82,34	82,48	0,91
Latvia	71,02	72,42	73,08	73,48	73,58	73,78	73,98	74,12	74,48	74,58	74,63	74,78	75,39	75,39	73,91	4,37
Lithuania	70,90	71,81	72,91	73,27	73,56	73,86	73,91	74,52	74,32	74,67	75,48	75,68	76,28	74,93	74,01	4,03
Luxembourg	79,38	80,54	80,64	80,63	80,99	81,39	81,80	82,23	82,29	82,69	82,10	82,30	82,64	81,74	81,52	2,36
Malta	79,79	79,64	80,24	81,40	80,75	80,75	81,75	82,05	81,90	82,45	82,35	82,45	82,86	82,65	81,50	2,86
Netherlands	80,10	80,25	80,55	80,70	81,20	81,10	81,30	81,71	81,51	81,56	81,76	81,81	82,11	81,41	81,22	1,31
New Zealand	80,15	80,35	80,70	80,70	80,90	81,16	81,41	81,40	81,46	81,61	81,66	81,86	81,71	82,06	81,22	1,90
Norway	80,40	80,59	80,80	81,00	81,30	81,45	81,75	82,10	82,30	82,41	82,61	82,76	82,96	83,21	81,83	2,81
Poland	75,24	75,54	75,70	76,25	76,70	76,75	77,00	77,60	77,45	77,85	77,75	77,60	77,90	76,60	76,85	1,36
Portugal	78,32	78,52	78,73	79,03	80,47	80,37	80,72	81,12	81,12	81,12	81,42	81,32	81,68	80,98	80,35	2,65
Romania	72,57	72,57	73,31	73,46	74,41	74,41	75,06	74,91	74,91	75,21	75,31	75,36	75,61	74,35	74,39	1,79
Slovak Republic	74,21	74,70	74,91	75,11	75,96	76,11	76,41	76,81	76,56	77,17	77,17	77,27	77,67	76,87	76,21	2,66
Slovenia	78,56	78,77	78,97	79,42	79,97	80,12	80,32	81,08	80,78	81,18	81,03	81,38	81,53	80,53	80,26	1,97
Spain	80,87	81,18	81,48	81,63	82,48	82,43	83,08	83,23	82,83	83,33	83,28	83,43	83,83	82,33	82,53	1,46
Sweden	80,90	81,10	81,35	81,45	81,80	81,70	81,96	82,25	82,20	82,31	82,41	82,56	83,11	82,41	81,97	1,51
Switzerland	81,74	81,99	82,04	82,25	82,70	82,70	82,80	83,20	82,90	83,60	83,55	83,75	83,90	83,10	82,87	1,36
United Kingdom	79,45	79,60	80,05	80,40	80,95	80,90	81,00	81,30	80,96	81,16	81,26	81,26	81,20	80,90	80,74	1,45
United States	77,99	78,04	78,39	78,54	78,64	78,74	78,74	78,84	78,69	78,54	78,54	78,64	78,79	77,28	78,46	-0,71
Average	19,5	20,3	22,1	21,9	21,6	21,7	21,8	21,6	21,4	21,3	20,9	20,8	21,2	24,2	23,7	22,9

Source: WDI and author's calculation

Table 19: Life satisfaction / happiness (selected years 2012, 2017, 2023)

Country	2012	2017	2023	Average	Change
Australia	7,345	7,284	7,095	7,241	-0,250
Austria	7,227	7,006	7,097	7,110	-0,130
Belgium	7,113	6,891	6,859	6,954	-0,254
Bulgaria	3,889	4,714	5,466	4,690	1,577
Canada	7,499	7,316	6,961	7,259	-0,538
Croatia	5,623	5,293	6,125	5,680	0,502
Cyprus	6,416	5,621	6,130	6,056	-0,286
Czech Republic	6,360	6,609	6,845	6,605	0,486
Denmark	7,856	7,522	7,586	7,655	-0,269
Estonia	5,330	5,611	6,455	5,799	1,125
Finland	7,579	7,469	7,804	7,617	0,225
France	6,746	6,442	6,661	6,617	-0,085
Germany	6,572	6,951	6,892	6,805	0,320
Greece	6,133	5,227	5,931	5,764	-0,202
Hungary	4,943	5,324	6,041	5,436	1,098
Iceland	6,888	7,504	7,530	7,307	0,641
Ireland	7,284	6,977	6,911	7,057	-0,374
Italy	6,578	5,964	6,405	6,316	-0,174
Latvia	4,762	5,850	6,213	5,608	1,451
Lithuania	5,588	5,902	6,763	6,084	1,175
Luxembourg	7,051	6,863	7,228	7,047	0,177
Malta	5,960	6,527	6,300	6,262	0,340
Netherlands	7,512	7,377	7,403	7,431	-0,109
New Zealand	7,372	7,314	7,123	7,270	-0,250
Norway	7,524	7,537	7,315	7,459	-0,209
Poland	5,803	5,973	6,260	6,012	0,457
Portugal	5,327	5,195	5,968	5,497	0,641
Romania	5,178	5,825	6,589	5,864	1,411
Slovakia	5,657	6,098	6,469	6,074	0,812
Slovenia	5,922	5,758	6,650	6,110	0,728
Spain	6,761	6,403	6,436	6,533	-0,325
Sweden	7,379	7,284	7,395	7,353	0,016
Switzerland	7,499	7,494	7,240	7,411	-0,259
United Kingdom	6,936	6,714	6,796	6,815	-0,141
United States	7,270	6,993	6,894	7,052	-0,377

Source: World Happiness Report and author's calculation

Table 20: Trust in Government

Country	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Australia	53,2	52,7	64,5		61,0	53,1	42,0	45,6	46,5	47,9	45,3	45,3	46,9	46,9	44,6	51,9	49,9
Austria	49,7		25,7	48,1	49,2	40,7	37,7	41,7	40,8	45,5	43,3	43,6	48,9	51,2	62,6	61,0	
Belgium	55,2	60,2	46,3		33,7	28,9	44,0	55,4	46,9	45,9	41,9	45,0	44,2	32,8	29,5	47,3	57,2
Canada	44,3	63,8	59,0	60,8	55,1	55,3	52,3	50,6	51,7	64,4	61,8	65,3	61,0	54,9	60,0	61,0	50,7
Czechia	28,3	26,9		35,5	31,2	20,6	17,0	24,3	34,0	43,5	41,5	34,4	0,4		31,9	28,4	34,1
Denmark	66,9	59,3	66,6	62,7	58,7	47,2	53,4	39,1	45,8	58,0	46,8	57,2	63,2	63,3	71,6	65,2	63,5
Estonia	44,2	42,0	19,1	2,2		41,8	27,3	26,1	41,5	33,7	34,0	40,6	42,0	40,3	46,5	51,9	50,8
Finland	75,8		72,3		46,2	56,5	59,8	42,1	46,9	55,8	48,6	59,8	55,5	63,9	80,9	71,4	77,5
France	32,5	36,1	45,3	47,4	40,1	37,5	44,1	39,5	2,6	32,8	28,4	37,5	38,1	38,2	41,0	43,4	
Germany	32,2	35,0	43,2	53,3	39,5	42,5	51,7	55,8	60,1	62,8	55,3	62,3	59,3	56,8	65,4	60,5	60,8
Greece	48,8	38,1		31,6	23,7	17,5	12,6	14,4	18,8	43,7	13,2	14,0	15,7	39,6	39,7	40,2	25,6
Hungary	36,1	25,0	20,0		25,2	36,0	21,0	32,8	30,8	27,9	30,4	37,8	38,8	48,4	42,9	41,7	44,2
Iceland	23,8		23,8				25,7	45,7		42,7	36,4	36,5		52,1	59,2	63,4	51,5
Ireland	63,3	30,3	51,4	29,3	33,3	52,9	34,6	28,5	46,0	57,2	57,5	60,4	61,8	58,1	58,8	62,3	
Italy	23,9		36,3	40,0	33,4	26,0	28,1	14,6	30,9	26,1	23,8	23,0	20,7	22,2	37,5	35,4	
Latvia	29,1	28,1	16,1	99,9		10,7	19,1	23,4	22,9	29,9	31,5	26,4	19,7	23,9	30,7	29,5	
Lithuania	20,6	26,9		12,6	11,5	18,1	14,6	38,4	34,5	36,7	28,0	32,1	32,4	40,7	47,4	30,4	
Luxembourg	82,4		82,4		76,8	77,1	74,4	73,7	66,3	69,5	67,9	73,9	75,5	78,0		78,0	
Netherlands	42,9	66,2	61,7		63,6	60,3	57,5	54,3	52,5	58,0	57,2	67,0	65,7	61,7	78,1	58,5	47,2
New Zealand	62,6	58,6	46,5		63,9	63,5	61,5	54,4	63,0	62,1	57,0	60,9	64,2	67,5	62,9	63,5	51,4
Norway	68,3		54,1				66,3		70,0	58,7	65,8	71,7	68,0	59,8	82,9	77,4	63,6
Poland	6,9	18,8	28,5	31,2	35,6	27,2	26,9	16,4	25,3	21,1	38,3	50,2	42,8	49,8	27,3	25,9	34,2
Portugal	45,2		34,0	28,2	24,5	21,0	23,1	17,9	22,7	21,8	35,5	50,1	52,1	43,6	61,5	57,6	58,9
Slovak Republic	16,3				30,9	27,9	36,8	28,3	31,0	27,7	37,2	34,2	32,8	23,1	30,7	21,6	
Slovenia	47,8			36,8	33,2	18,2	23,8	16,3	17,7	20,3	25,0	24,0	23,9	39,7	45,3	33,9	45,1
Spain	52,8		58,0	42,4	30,3	30,9	33,9	18,5	21,1	27,8	30,3	27,0	28,5	36,8	38,2	37,2	
Sweden	44,1	47,6	51,7	59,0	60,3	63,9	62,6	58,0	56,3	49,9	48,6	55,9	49,4	51,3	67,1	63,4	68,8
Switzerland	63,2	56,2	32,4	57,8			77,0		75,2	78,8	79,9	82,0	85,0	80,7	84,6	83,8	
United Kingdom	49,5	36,4	37,9	38,4	50,4	46,8	42,1	37,9	42,3	45,7	40,9	44,0	42,1	34,1	34,7	39,5	31,0
USA	55,8	39,3	33,1	50,3	41,8	38,3	34,9	28,9	34,9	34,7	29,7	38,7	31,4	36,3	46,5	40,5	

Source: OECD

Table 21: Social spending as a percentage of GDP (in %)

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2009-2020
Austria	25,5	25,9	28,0	28,1	27,2	27,6	28,0	28,3	28,3	28,2	27,8	27,6	27,7	31,1	31,1	29,4	3,2
Belgium	24,3	25,7	28,0	27,7	28,1	28,0	28,3	28,4	29,1	28,4	28,3	28,4	28,2	32,3	29,7	29,0	4,3
France	28,2	28,5	30,9	31,0	30,7	31,2	31,7	32,0	31,8	31,9	31,4	31,0	30,7	34,9	32,7	31,6	3,9
Germany	24,2	24,4	26,8	26,1	24,8	24,7	24,8	24,8	25,1	25,3	25,2	25,3	25,6	27,9	27,6	26,7	1,1
Ireland	16,7	20,0	23,9	24,1	23,3	23,0	21,8	20,1	15,2	15,1	14,2	13,5	12,9	15,7	14,2	12,8	-8,2
Luxembourg	19,9	20,8	22,5	21,7	20,6	20,7	20,9	20,8	20,5	20,3	20,7	21,0	21,6	23,9	21,6	21,9	1,4
Netherlands	15,7	15,5	17,1	17,5	17,5	17,9	18,1	17,9	17,6	17,5	16,6	16,3	16,3	18,9	18,7	17,6	1,8
Switzerland	14,4	14,0	15,6	15,2	15,2	15,4	15,7	15,6	16,1	16,2	16,4	16,0	16,1	19,3	18,0	17,0	3,8
United Kingdom	19,6	20,8	22,9	23,1	22,9	23,0	22,2	21,7	21,3	20,6	20,2	19,7	19,5	22,5	22,1	..	-0,4
Denmark	25,9	26,3	29,3	29,9	30,0	30,2	30,0	30,0	30,0	29,4	29,0	28,5	28,4	29,3	28,3	26,2	0,1
Finland	22,9	23,4	26,9	27,4	27,1	28,3	29,4	30,2	30,5	30,4	29,6	29,4	29,4	31,0	30,3	29,0	4,1
Iceland	15,8	16,2	18,5	17,7	18,1	17,8	17,3	17,5	16,6	16,5	17,5	17,8	18,7	23,0	22,3	20,8	4,5
Norway	19,6	19,3	22,5	22,1	21,6	21,5	21,9	22,8	24,7	25,9	25,1	24,2	25,3	28,2	24,4	20,7	5,6
Sweden	25,3	25,4	27,2	25,8	25,3	26,3	26,9	26,6	26,1	26,5	25,9	25,6	25,1	25,9	24,9	23,7	-1,4
Cyprus			19,1	18,6	20,1	20,9	22,9	20,1	20,0	19,4	18,3	17,7	18,0	24,1			5,0
Greece	20,1	21,6	23,9	25,0	26,5	27,4	25,4	25,5	25,7	26,0	25,2	25,0	25,1	27,9	26,1	24,1	3,9
Italy	24,0	24,9	27,0	26,9	26,5	27,3	27,9	28,1	28,3	27,9	27,7	27,5	27,7	32,6	30,7	30,1	5,7
Malta			19,3	18,9	18,8	18,7	18,3	17,8	16,4	16,4	15,3	14,8	14,6	19,8			0,5
Portugal	21,3	21,8	24,1	24,3	24,2	24,3	25,4	25,0	23,9	23,5	22,7	22,5	22,3	25,1	24,8	24,6	1,0
Spain	20,9	22,3	25,6	24,9	25,5	25,6	25,7	25,4	24,7	24,2	23,9	24,0	24,6	31,2	29,5	28,1	5,6
Bulgaria			16,1	17,0	16,4	16,5	17,6	18,4	17,6	17,3	16,8	16,8	16,5	18,7			2,6
Croatia			20,8	21,0	20,7	21,3	21,0	21,5	21,5	21,5	21,2	21,3	21,2	24,1			3,3
Czech Republic	17,4	17,7	19,9	19,5	19,6	19,9	20,7	20,1	19,3	18,9	18,9	19,1	19,5	22,6	22,5	22,0	2,7
Estonia	12,4	15,1	19,4	18,1	16,2	15,8	15,7	16,0	17,3	17,5	17,0	17,5	17,9	19,8	18,4	17,2	0,4
Hungary	22,4	22,6	23,2	22,8	22,2	22,5	22,2	21,3	20,3	20,2	19,4	18,6	17,6	18,5	18,1	17,2	-4,6
Latvia	11,0	12,9	17,9	19,1	16,9	15,3	15,5	15,4	15,7	16,0	15,8	16,1	16,5	18,5	19,8	19,7	0,6
Lithuania	14,8	16,6	21,8	19,4	17,4	16,3	15,3	15,5	15,8	15,6	15,3	16,4	17,0	21,1	18,7	19,8	-0,8
Poland	19,5	20,2	21,3	20,7	19,6	19,9	20,6	20,3	20,2	21,2	20,8	20,5	21,2	23,2	22,6	22,7	1,9
Romania			16,2	17,1	15,8	14,7	15,0	14,7	14,6	14,9	14,9	14,9	15,2	17,7			1,5
Slovak Republic	14,9	14,9	17,8	17,4	17,1	17,3	17,7	17,7	17,2	17,6	17,5	17,2	17,5	19,8	19,6	19,1	2,0
Slovenia	19,8	19,9	22,4	23,4	23,4	23,5	23,8	23,1	22,7	22,2	21,5	21,3	21,5	24,5	23,7	22,8	2,0
Australia	15,9	17,1	16,9	16,6	17,0	17,3	17,3	17,8	18,2	17,5	17,1	16,6	20,5	..	..	..	..
Canada	16,3	16,4	18,1	17,6	17,1	17,2	17,0	16,9	17,9	18,3	18,0	18,0	18,8	24,9	..	..	6,8
New Zealand	20,7	22,6	23,6	23,4	22,9	22,8	21,3	21,1	20,0	19,7	18,7	19,5	23,6	22,0	20,8	..	-1,6
United States	15,7	16,2	18,3	19,0	18,7	18,5	18,4	18,4	18,5	18,7	18,5	18,2	18,3	23,9	22,7	..	5,6
Average	19,5	20,3	22,1	21,9	21,6	21,7	21,8	21,6	21,4	21,3	20,9	20,8	21,2	24,2	23,7	22,9	2,2

Source: OECD + Eurostat (for Bulgaria, Croatia, Cyprus, Malta, Romania; only 2009-2020; the Eurostat values are systematically higher, by about 2%, than the OECD values as they include administrative costs) and author's calculation

Table 22: Social spending as percentage of total government spending (in %)

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average
Australia	28,12	27,73	30,54	26,18	26,30	26,63	27,20	27,52	28,09	28,03	27,20	26,47	26,43	26,10	27,32
Austria	39,46	39,30	39,33	40,56	40,71	40,86	41,28	40,96	41,50	41,98	41,82	41,42	41,52	40,14	40,77
Belgium	34,62	34,50	35,16	35,01	34,54	34,64	35,71	35,54	36,08	36,53	37,11	36,91	37,16	38,40	35,85
Bulgaria	26,84	28,75	32,78	35,60	36,08	35,90	35,72	30,84	32,17	35,46	35,24	32,37	32,25	31,42	32,96
Canada		28,16	28,82	28,38	28,27	28,49	28,78	29,15	29,78	30,33	30,28	30,19	29,84	34,79	29,64
Croatia	29,48	29,30	30,66	30,94	31,23	31,05	30,79	31,38	32,01	30,48	31,33	30,81	30,22	28,75	30,60
Cyprus	26,58	26,63	27,42	29,05	29,94	30,86	31,54	28,10	33,39	35,37	34,61	28,63	31,34	30,19	30,26
Czechia	29,90	29,92	30,22	30,97	31,33	30,68	32,50	31,48	30,79	31,99	31,66	30,52	30,52	30,50	30,93
Denmark	43,28	42,84	42,93	43,82	43,76	42,41	43,93	43,46	43,07	43,62	43,97	43,26	43,53	41,86	43,27
Estonia	26,76	28,55	32,71	34,23	32,71	30,62	30,28	30,45	31,55	32,51	32,11	32,57	33,16	32,78	31,50
Finland	40,98	40,40	41,71	41,94	41,90	42,59	43,32	44,05	44,75	45,81	45,79	45,50	45,18	44,64	43,47
France	41,23	41,02	41,49	41,63	42,11	42,32	42,74	42,83	42,87	43,12	42,79	42,96	43,04	44,23	42,46
Germany	43,59	42,57	42,99	41,74	41,80	42,17	42,34	42,50	43,33	44,05	44,06	43,51	43,65	42,96	42,95
Greece	33,41	33,55	34,47	35,84	37,37	37,64	31,35	40,18	37,74	41,47	41,30	40,87	41,41	37,73	37,45
Hungary	34,50	35,67	35,76	35,32	34,39	33,78	32,78	30,58	28,94	30,36	29,34	28,38	27,77	26,39	31,71
Iceland	18,05	13,94	19,99	21,25	21,34	21,52	21,33	21,37	20,92	28,28	22,30	23,07	25,09	27,32	21,84
Ireland	35,92	36,42	37,78	26,95	33,83	37,13	36,97	36,15	35,14	35,48	36,18	35,32	36,22	37,41	35,49
Italy	37,20	37,59	38,60	39,44	39,74	40,04	41,03	41,53	42,28	42,54	42,43	42,68	43,43	44,11	40,90
Latvia	22,91	23,52	30,77	30,67	29,66	29,28	30,03	29,41	30,52	31,64	30,23	29,56	31,45	31,30	29,35
Lithuania	32,63	33,94	39,63	37,51	32,99	36,76	35,13	36,19	34,87	35,83	36,98	38,50	38,60	37,99	36,25
Luxembourg	40,31	40,99	41,50	40,94	41,22	41,39	42,99	43,16	43,35	42,91	42,88	42,59	42,63	43,86	42,19
Malta	32,55	31,22	33,79	33,12	32,54	32,40	32,55	31,54	29,98	31,38	31,15	29,22	28,76	26,18	31,17
Netherlands	34,07	34,20	34,45	35,02	35,86	36,25	36,89	37,17	37,70	38,56	38,46	37,70	37,73	36,13	36,44
New Zealand			31,22	30,95	37,20	30,59	30,08	30,32	30,53	30,15	30,22	29,16	29,30	26,77	30,54
Norway	37,03	37,48	38,35	38,86	39,33	39,86	39,73	39,36	39,63	39,84	39,44	38,94	38,25	38,12	38,87
Poland	36,36	35,11	35,79	35,56	35,21	36,29	37,52	37,56	37,69	40,42	39,80	38,97	39,93	37,31	37,39
Portugal	33,69	33,82	34,39	33,47	35,87	37,80	38,96	36,77	38,37	40,29	37,93	39,17	39,74	38,19	37,03
Romania	26,78	29,16	33,23	34,74	32,81	33,12	32,54	32,23	31,72	33,30	34,77	33,33	32,66	32,72	32,37
Slovakia	35,63	33,61	33,94	35,57	35,09	36,06	35,80	34,60	32,11	34,98	36,82	36,10	35,23	35,70	35,09
Slovenia	37,37	36,59	37,26	38,30	38,51	39,49	32,39	36,88	37,53	38,20	38,65	38,12	37,98	36,44	37,41
Spain	33,23	33,87	35,54	37,00	37,41	37,18	40,25	39,76	40,40	40,66	41,10	41,16	41,99	42,72	38,73
Sweden	40,60	39,81	40,86	40,30	39,44	40,05	40,61	40,51	40,80	41,36	40,60	39,26	38,65	37,77	40,04
Switzerland	39,31	38,51	38,42	38,98	38,85	38,65	39,95	39,60	39,42	39,68	39,54	39,43	39,30	43,36	39,50
United Kingdom	34,78	33,42	35,36	35,41	36,20	37,10	37,59	37,43	37,85	37,53	36,58	36,53	36,08	31,94	35,99
United States	17,93	19,41	19,99	20,86	20,50	20,28	20,64	20,38	20,54	20,18	20,01	19,77	19,82	25,45	20,41
Average	33,49	33,28	34,80	34,75	35,03	35,20	35,23	35,17	35,36	36,41	36,13	35,51	35,71	35,48	35,11

Source: https://datafinder.qog.gu.se/downloads?download=gfs_sp

Table 23: Changing structure of social spending (in % of GDP)

Type of spending	2005	2010	2015	2017	2018	2019
Old age	6,2	7,1	7,4	7,3	7,3	7,4
Survivors	0,9	0,9	0,9	0,8	0,8	0,8
Old age and Survivors	7,1	8,0	8,3	8,2	8,1	8,2
Incapacity related	2,0	2,1	2,0	2,0	1,9	2,0
Health	5,2	5,8	5,7	5,7	5,7	5,8
Family	1,8	2,2	2,1	2,1	2,1	2,1
Active labour market programmes	0,5	0,5	0,5	0,5	0,4	0,6
Unemployment	0,7	0,9	0,7	0,6	0,6	0,6
Housing	0,3	0,4	0,3	0,3	0,3	0,3
Other social policy areas	0,5	0,6	0,5	0,5	0,5	0,5
Total	18,1	20,4	20,1	19,8	19,7	20,1

Source: OECD

Table 24: Pension entitlements; gross pension replacement rate (different income levels) in % (Year of labour market entry: 2020)

Country	Male 0.50 of AW	Male 1.00 of AW	Male 1.50 of AW	Female 0.50 of AW	Female 1.00 of AW	Female 1.50 of AW
Australia	62,7	31,3	31,3	59,8	28,4	28,4
Austria	74,1	74,1	57,3	74,1	74,1	57,3
Belgium	67,5	43,4	29,2	67,5	43,4	29,2
Canada	53,2	38,8	22,3	53,2	38,8	22,3
Czech Republic	81,2	49	32,9	81,2	49	32,9
Denmark	125,1	80	61,3	125,1	80	61,3
Estonia	47,7	28	18,2	47,7	28	18,2
Finland	56,6	56,6	56,6	56,6	56,6	56,6
France	60,2	60,2	51,9	60,2	60,2	51,9
Germany	46,5	41,5	33	46,5	41,5	33
Greece	84,7	72,6	66,5	84,7	72,6	66,5
Hungary	62,5	62,5	62,5	58,1	58,1	58,1
Iceland	72,9	51,8	51,8	72,9	51,8	51,8
Ireland	59,4	29,7	14,9	59,4	29,7	14,9
Italy	74,6	74,6	74,6	74,6	74,6	74,6
Latvia	43,4	43,4	43,4	43,4	43,4	43,4
Lithuania	31,5	19,7	13,8	31,5	19,7	13,8
Luxembourg	90,4	76,6	69,7	90,4	76,6	69,7
Mexico	80,9	61,2	53,6	80,9	58,2	50,5
Netherlands	73,1	69,7	68	73,1	69,7	68
New Zealand	65,9	39,8	19,9	65,9	39,8	19,9
Norway	60,6	46	28,9	60,6	46	28,9
Poland	31,8	30,6	30	31,9	23,4	22,8
Portugal	76,3	74,9	72,5	76,3	74,9	72,5
Slovak Republic	62,6	53,1	46,7	62,6	53,1	46,7
Slovenia	62,3	42	41,4	62,3	42	41,4
Spain	73,9	73,9	67	73,9	73,9	67
Sweden	61,4	53,3	67,2	61,4	53,3	67,2
Switzerland	53,1	44,1	23	52,5	43,5	22,7
United Kingdom	70,6	49	38,2	70,6	49	38,2
United States	49,6	39,2	27,9	49,6	39,2	27,9
Bulgaria	57,3	57,3	57,3	57,3	57,3	57,3
Croatia	57	38	38	57	38	38
Cyprus	64,5	64,5	64,5	64,5	64,5	64,5
Malta	59,1	57,6	47,2	59,1	57,6	47,2
Romania	40,6	40,6	40,6	38	38	38

Source: OECD

Table 25: Levels of protection against different risks (percentage of persons covered)

Country	Year	Disability	Year	Work injury	Year	Child	Year	Retired	Year	1 social protection	Year	Unemployed	Year	Poor	Year	Vulnerable	Score
Australia	2018	100	2019	72	2018	100	2018	100	2018	100	2018	60,5	2016	100	2018	100,0	90,4
Austria	2018	100	2019	77,4	2018	100	2018	100	2018	100	2018	100,0	2016	100	2018	93,0	95,8
Belgium	2018	100	2019	63,1	2018	100	2018	100	2018	100	2018	100,0	2016	100	2018	100,0	94,7
Bulgaria	2018	100	2019	86,8	2016	48,6	2018	94	2018	84,7	2018	35,4	2016	52,1	2018	28,1	63,6
Canada	2019	68	2019	69,1	2016	39,7	2018	100	2018	100	2018	41,2	2016	100	2018	100,0	74,0
Croatia	2018	100	2011	68	2018	47	2018	89,8	2018	75	2018	22,4					46,7
Cyprus	2017	22,6			2016	60,3	2018	97,8	2018	59,5	2018	17,8	2016	100	2018	24,1	46,1
Czechia	2018	100	2019	66,2	2018	10,8	2018	91,3	2018	86,8	2018	45,7	2016	99,6	2018	32,0	63,7
Denmark	2018	100	2019	88	2018	100	2018	100	2018	93,2	2018	93,7	2016	100	2018	63,7	92,2
Estonia	2018	100	2019	76,8	2018	100	2018	100	2018	94,8	2018	47,5	2016	100	2018	91,7	88,0
Finland	2018	100	2019	66,5	2018	100	2018	100	2018	100	2018	100,0	2016	100	2018	100,0	95,2
France	2018	100	2019	74,1	2018	100	2018	100	2018	100	2018	100,0	2016	100	2018	100,0	96,3
Germany	2018	100	2019	100	2018	100	2018	100	2018	100	2018	100,0	2016	100	2018	96,0	99,4
Greece	2018	100	2019	46,9			2018	95,8	2018	63,8	2018	26,4					38,4
Hungary	2018	100	2019	78,3	2018	100	2018	90,5	2018	90	2018	26,3	2016	100	2018	56,0	78,7
Iceland	2018	100	2019	95,1	2018	63,4	2018	71,4	2018	85,3	2018	100,0					61,4
Ireland	2018	100	2019	71,8	2018	100	2018	100	2018	89,9	2018	100,0	2016	100	2018	73,8	92,2
Italy	2017	91,4	2019	72,2			2018	94,4	2018	85,7	2018	48,2			2018	42,6	49,8
Latvia	2018	100	2019	69,2	2018	100	2018	92	2018	96,1	2018	40,0	2016	100	2018	85,0	83,7
Lithuania	2018	100	2019	64,7	2018	100	2018	97,1	2018	100	2018	37,7	2016	54,1			64,8
Luxembourg	2018	100	2019	77,1	2018	100	2018	100	2018	100	2018	49,8					61,0
Malta	2018	60	2019	73,5			2018	100			2018	49,7					40,5
Netherlands	2018	100	2019	97,6	2018	100	2018	100	2018	97,2	2018	65,0	2016	100	2018	90,3	93,3
New Zealand	2019	82	2019	100	2018	67,1	2018	100	2018	100	2018	40,0	2016	37,4	2018	100,0	75,2
Norway	2018	100	2019	89,6	2018	100	2018	100	2018	98,8	2018	58,2	2016	100	2018	83,1	90,1
Poland	2018	100	2020	100	2018	100	2018	83,6	2018	88	2018	16,5	2016	100	2018	52,0	78,9
Portugal	2019	89	2019	77,3	2016	93,1	2018	90,4	2018	92,6	2018	40,2	2016	100	2018	59,3	78,5
Romania	2018	100	2019	63,1	2018	100	2018	93,5	2018	92,9	2018	15,8	2016	100	2018	82,6	79,3
Slovakia	2018	100	2019	66,4	2018	100	2018	90,6	2018	95,5	2018	13,0	2016	100	2018	70,0	77,1
Slovenia	2018	100	2015	80,5			2018	100	2018	94,8	2018	29,7	2016	100	2018	100,0	72,9
Spain	2017	77,3	2016	76,2	2018	100	2018	98,2	2018	82,6	2018	44,2	2016	100	2018	45,0	77,3
Sweden	2018	100	2019	84,8	2018	100	2018	100	2018	100	2018	60,2	2016	100	2018	100,0	92,1
Switzerland	2017	96,9	2019	66,7	2018	100	2018	100	2018	96,6	2018	62,0	2016	100	2018	70,2	85,1
United Kingdom	2018	100	2019	68	2018	100	2018	100	2018	92,1	2018	56,4	2016	100	2018	76,6	85,9
United States	2018	100	2019	84,8	2018	100	2018	100	2018	83,8	2018	28,3	2016	64,5	2018	31,0	72,7
Average		93,9		76,8		88,1		96,3		91,8		53,5		93,4		74,0	76,4

Source: ILO and author's calculation

Table 26: Distribution of market income (Gini coefficient)

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Australia	..	..	..	..	..	0,46	..	0,48	..	0,47	..	0,45	..
Austria	0,49	0,49	0,50	0,50	0,49	0,49	0,50	0,49	0,49	0,50	0,49	0,49	0,49
Belgium	..	..	..	..	..	..	..	..	..	..	..	0,49	0,49
Canada	0,43	0,43	0,44	0,44	0,43	0,43	0,43	0,43	0,43	0,43	0,44	0,43	0,42
Czech Republic	0,45	0,44	0,45	0,45	0,46	0,45	0,46	0,46	0,46	0,45	0,44	0,43	0,43
Denmark	..	..	..	..	0,43	0,44	0,44	0,44	0,45	0,45	0,45	0,44	0,45
Estonia	..	..	..	..	..	..	0,51	0,49	0,47	0,46	0,45	0,44	0,47
Finland	0,48	0,47	0,48	0,49	0,49	0,49	0,50	0,50	0,51	0,51	0,51	0,51	0,51
France	..	..	..	..	..	0,52	0,50	0,51	0,52	0,52	0,52	0,53	0,52
Germany	..	0,49	..	..	0,51	0,50	0,51	0,50	0,50	0,51	0,50	0,49	0,50
Greece	0,50	0,50	0,50	0,52	0,55	0,56	0,55	0,56	0,55	0,54	0,53	0,52	0,53
Hungary	0,51	0,50	0,50	0,51	0,51	0,51	0,52	0,49	0,49	0,48	0,48	0,46	0,46
Iceland	0,38	0,39	0,38	0,40	0,40	0,40	0,38	0,39	0,39	0,38	0,37	..	..
Ireland	0,51	0,54	0,58	0,58	0,57	0,58	0,57	0,55	0,55	0,54	0,54	0,52	..
Italy	0,49	0,49	0,49	0,51	0,51	0,51	0,51	0,51	0,52	0,52	0,52	0,51	..
Latvia	0,47	0,48	0,50	0,52	0,51	0,50	0,50	0,48	0,48	0,47	0,48	0,48	0,47
Lithuania	0,47	0,50	0,53	0,53	0,51	0,53	0,51	0,53	0,51	0,51	0,51	0,50	0,50
Luxembourg	..	..	..	..	..	..	..	..	0,47	0,48	0,50	0,49	0,49
Netherlands	..	..	..	..	0,43	0,43	0,44	0,46	0,46	0,45	0,45	0,45	0,46
New Zealand	..	..	..	..	..	..	..	..	..	..	..	0,45	0,45
Norway	..	0,40	0,40	0,41	0,41	0,41	0,41	0,42	0,43	0,43	0,43	0,43	0,43
Poland	0,48	0,47	0,46	0,47	0,46	0,46	0,46	0,46	0,45	0,46	0,45	0,45	..
Portugal	0,52	0,52	0,51	0,52	0,53	0,53	0,55	0,54	0,54	0,53	0,52	0,51	0,51
Slovak Republic	0,42	0,41	0,43	0,43	0,42	0,41	0,43	0,40	0,40	0,40	0,38	0,39	0,38
Slovenia	0,42	0,42	0,44	0,45	0,45	0,46	0,46	0,46	0,46	0,45	0,45	0,44	0,44
Spain	0,45	0,46	0,49	0,51	0,51	0,51	0,52	0,52	0,52	0,52	0,51	0,51	0,49
Sweden	..	..	..	..	..	..	0,42	0,43	0,43	0,43	0,43	0,43	0,43
Switzerland	0,37	0,37	0,37	0,37	0,37	0,37	0,39	0,38	0,39	0,39	0,39	0,40	0,40
United Kingdom	0,52	0,52	0,54	0,52	0,52	0,52	0,53	0,52	0,52	0,51	0,51	0,51	0,51
United States	..	..	..	..	..	..	0,51	0,51	0,51	0,51	0,51	0,51	0,51
Bulgaria	0,49	0,45	0,45	0,45	0,46	0,47	0,49	0,49	0,52	0,53	0,53	0,53	0,52
Romania	0,54	0,53	0,51	0,54	0,54	0,54	0,54	0,54	0,54	0,52	0,52	0,52	0,51
Average	0,47	0,47	0,47	0,48	0,48	0,48	0,48	0,48	0,48	0,48	0,47	0,47	0,47

Source: OECD and author's calculation

Table 27: Poverty rate (income less than 50% of median income) in percent

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Australia						14		12,8		12,1		12,4		12,6	
Austria	9,0	15,0	13,6	14,7	12,5	13,3	11,5	13,4	12,4	12,5	13,9	14,4	12,3	14,3	14,9
Belgium	11,0	11,1	11,7	11,3	12,3	12,3	11,9	13,6	11,8	13,1	13,9	15,2	11,7	13,1	10,6
Bulgaria	29,4	26,9	32,0	30,9	33,5	30,6	31,8	31,7	36,1	36,0	39,4	35,6	37,6	40,0	35,3
Canada	12,9	12,7	13,4	13,1	13,1	13,3	13,2	12,6	14,1	12,4	12	11,8	11,5	8,6	
Croatia	:	:	:	26,3	26,8	25,2	24,5	24,1	26,2	26,6	28,5	29,8	29,2	29,7	31,8
Cyprus	20,3	16,1	15,7	15,7	16,6	14,8	13,0	13,9	15,1	14,5	14,3	16,3	14,0	14,3	11,0
Czechia	9,7	9,9	10,6	10,2	10,2	9,5	9,9	10,5	13,0	13,0	11,4	11,6	11,4	12,5	11,6
Denmark	6,4	5,1	7,2	9,1	6,2	9,3	7,4	5,8	7,1	7,0	8,2	8,2	7,2	8,3	8,2
Estonia	17,3	21,0	16,2	12,6	16,0	15,7	15,7	18,2	19,6	21,4	23,0	27,8	26,0	22,5	19,4
Finland	7,5	9,4	9,6	7,7	8,2	8,6	8,1	6,8	7,4	5,4	5,4	8,5	8,9	8,5	6,2
France	8,9	7,1	8,7	8,9	7,9	8,2	8,9	9,0	8,2	8,7	8,1	8,2	8,7	10,9	10,7
Germany	15,3	14,3	13,5	15,3	15,2	15,5	14,8	18,4	18,3	18,8	19,2	20,2	17,4	18,0	17,9
Greece	17,8	17,1	16,5	16,6	19,5	17,3	18,2	18,4	17,3	17,4	16,4	14,9	15,1	15,3	17,0
Hungary	10,8	9,9	9,9	9,7	13,2	17,0	18,1	18,4	17,0	12,5	7,8	14,2	14,7	15,1	21,1
Iceland	5,0	4,6	5,7	5,5	4,4	4,4	3,5	3,3	3,8	3,4	4,3	4,3	:	:	:
Ireland	12,1	10,3	9,1	8,3	10,0	11,8	11,2	11,5	10,3	12,9	10,9	11,9	10,0	10,1	12,0
Italy	15,1	14,5	13,9	14,1	14,6	14,3	14,5	14,7	15,3	16,9	16,3	16,5	17,2	17,2	16,5
Latvia	24,6	33,5	32,5	21,5	18,6	19,2	18,4	21,6	26,2	27,6	30,4	31,6	34,5	32,0	35,0
Lithuania	19,9	23,3	20,9	17,2	16,8	16,2	20,2	17,7	21,8	26,0	29,8	31,2	26,8	26,7	25,0
Luxembourg	9,7	8,6	9,4	10,0	8,0	8,9	10,7	10,8	11,2	12,5	14,2	13,2	13,9	12,9	14,4
Malta	8,9	9,7	8,2	9,0	9,4	8,2	9,8	9,4	10,5	10,3	10,7	11,2	11,4	11,1	11,8
Netherlands	4,5	5,1	4,0	4,0	4,1	4,0	4,2	4,5	5,1	6,5	6,8	6,0	6,6	7,5	9,5
New Zealand	14,2	13,6	14,2	13	13,7	14,9	14,1	7,7	13	14,1	15,3	11,4	12,9	12,4	
Norway	8,3	9,5	8,9	7,5	7,6	8,4	6,7	8,5	9,4	10,0	8,6	10,3	11,1	10,2	:
Poland	14,1	14,7	15,8	16,6	16,1	16,9	17,0	17,3	17,1	18,4	16,7	17,5	18,7	19,9	17,2
Portugal	11,7	12,4	11,2	12,2	12,1	12,2	14,3	16,0	16,3	16,0	15,0	13,6	13,3	13,4	15,8
Romania	30,2	25,9	24,7	23,7	25,3	24,5	25,4	29,6	27,1	26,5	31,5	33,9	35,5	34,9	36,4
Slovakia	11,7	11,0	13,0	13,8	12,9	14,2	14,1	17,3	16,5	16,8	16,9	17,9	22,4	20,4	:
Slovenia	14,0	14,7	14,6	16,2	16,5	16,4	19,1	17,6	18,1	19,0	16,8	16,6	16,1	15,7	14,2
Spain	14,3	14,3	14,8	15,0	15,0	15,8	16,2	18,5	18,3	18,2	18,4	18,5	15,9	18,0	18,5
Sweden	6,2	9,1	9,1	9,3	10,2	9,8	10,8	10,5	11,2	13,1	12,5	13,4	15,0	13,3	15,5
Switzerland	14,4	17,5	18,9	17,1	17,2	20,3	17,1	16,6	17,1	16,9	17,5	15,4	19,8	18,1	18,4
United Kingdom	19,0	19,0	15,4	15,3	14,3	12,3	11,9	12,6	13,3	12,7	15,9	17,0	:	:	:
USA							17,2	10,5	16,8	17,8	17,8	10,5	18	16,6	15,1
Average	13,6	14,0	13,8	13,7	13,9	14,0	14,2	14,4	15,4	15,6	16,1	16,3	17,0	16,8	17,5

Source: Eurostat except Australia, Canada, New Zealand and USA (taken from OECD) and author's calculation; values are substantially lower according to OECD than to Eurostat, probably due to different income concepts used (Eurostat is using equivalized disposable income, OECD disposable income. As equivalized income per capita is higher, the poverty threshold of 50 or 60 percent of the median income is higher, too.).

Table 28: Share of administrative costs in social spending (in%)

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Belgium	3,4	3,4	3,2	3,2	3,2	3,2	3,2	3,2	3,1	3,9	3,9	3,8	3,9	3,6	3,4
Bulgaria	2,6	2,4	2,2	2,0	2,2	2,2	2,0	2,0	2,0	2,0	2,0	2,3	2,3	2,3	2,2
Czechia	3,3	3,2	3,1	3,2	3,1	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0	2,9	3,1
Denmark	3,2	3,6	3,5	3,6	3,1	3,8	4,4	4,2	4,4	4,5	4,4	4,3	4,3	4,1	4,0
Germany	3,8	3,8	4,2	4,2	4,2	4,1	4,1	4,0	4,0	3,9	3,9	4,0	3,7	3,7	4,0
Estonia	1,2	1,2	1,1	1,1	1,1	1,2	1,2	1,2	1,2	1,3	1,6	1,5	1,4	1,7	1,3
Ireland	4,7	3,6	3,3	4,0	4,2	3,7	3,9	4,1	4,4	4,3	4,3	4,2	4,2	3,5	4,0
Greece	1,9	1,8	1,7	1,6	1,5	1,8	2,2	1,6	1,1	1,0	1,0	0,9	0,9	0,9	1,4
Spain	2,2	2,1	2,0	1,9	1,8	1,9	1,9	1,8	1,9	1,8	1,8	1,7	1,7	1,6	1,9
France	4,8	4,6	4,8	5,0	4,5	4,5	4,4	4,4	4,4	4,1	4,1	4,2	3,9	4,5	4,4
Croatia	..	2,7	2,3	2,2	2,0	1,9	1,9	1,8	1,7	1,5	1,5	1,6	1,6	1,6	..
Italy	2,8	2,7	2,7	2,6	2,5	2,5	2,4	2,3	2,3	2,3	2,2	2,1	2,1	2,0	2,4
Cyprus	1,5	1,4	1,4	1,3	1,4	1,3	1,2	1,1	1,2	1,3	1,3	1,2	1,2	0,9	1,3
Latvia	1,8	1,8	1,3	1,4	1,7	1,4	1,7	1,4	1,4	1,5	1,5	1,5	1,4	1,4	1,5
Lithuania	2,8	2,9	2,5	3,2	2,9	2,7	3,0	3,0	3,2	3,1	2,8	2,5	2,3	2,2	2,8
Luxembourg	1,6	1,6	1,5	1,6	1,5	1,5	1,5	1,5	1,4	1,5	1,5	1,4	1,4	1,3	1,5
Hungary	1,9	1,9	1,9	2,3	1,0	1,0	1,2	1,3	1,5	1,5	1,5	1,6	1,7	2,0	1,6
Malta	1,1	1,1	1,2	1,1	1,0	1,0	1,1	1,0	1,0	1,1	1,0	1,0	1,0	0,8	1,0
Netherlands	7,9	7,0	7,1	7,3	7,9	7,9	7,0	7,2	6,7	5,5	5,3	5,7	6,0	5,5	6,7
Austria	2,2	2,2	2,1	2,1	2,1	2,1	2,0	2,0	1,9	1,9	1,9	1,8	1,8	1,6	2,0
Poland	2,7	2,6	2,5	2,4	2,5	2,5	2,2	2,2	2,2	2,0	2,3	2,2	1,7	1,7	2,3
Portugal	2,2	2,2	1,8	1,7	1,6	1,5	1,5	1,5	1,5	1,4	1,4	1,5	1,6	1,5	1,6
Romania	2,7	1,3	1,1	1,0	0,9	1,1	2,1	2,1	2,2	1,5	2,0	1,9	1,9	4,4	1,9
Slovenia	2,1	2,0	1,9	1,9	1,6	1,6	1,5	1,6	1,6	1,5	1,5	1,5	1,5	1,3	1,7
Slovakia	4,0	3,3	2,8	3,0	2,7	2,6	2,6	2,7	2,5	2,6	2,6	2,5	2,7	2,3	2,8
Finland	3,2	3,1	3,0	2,8	2,7	2,6	2,7	2,6	1,7	1,7	1,7	1,8	1,7	1,6	2,4
Sweden	2,1	2,0	1,9	1,9	1,9	2,0	1,9	2,0	2,0	2,0	2,0	2,0	2,0	1,9	2,0
Iceland	1,2	1,0	1,0	1,1	1,0	0,9	0,9	0,8	0,8	0,6	0,7	0,8	0,7	0,7	0,9
Norway	2,1	2,2	2,1	2,1	2,0	2,0	2,0	1,9	1,9	1,9	1,8	1,8	1,7	1,7	1,9
Switzerland	5,7	5,7	5,3	5,6	5,8	5,9	5,8	5,8	5,8	5,8	5,8	5,8	5,8	5,4	5,7
United Kingdom	1,5	1,5	1,4	1,3	1,3	1,2	1,1	0,9	0,8	0,8	0,7	0,7	..	..	..

Source: Eurostat and author's calculations

5. ENVIRONMENTAL PROTECTION AND CLIMATE CHANGE

5.1. INTRODUCTION

The theme of environmental protection, which dates back to the 1970s, has in recent decades been integrated into the later and much broader agenda of sustainable development. This latter concept entails, as famously stated in the UN's Brundtland Report 'Our Common Future', "a development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). Sustainable development was later specified in terms of safeguarding four kinds of capital: economic, natural, social and human capital (Joint UNECE/Eurostat/OECD Task Force, 2013). The focus here is on natural capital only, and hence on environmental protection, i.e. on activities aimed at the prevention, reduction and elimination of pollution or any other degradation of the environment. Three issues are at the fore in protecting natural capital: climate change, depletion of natural resources and environmental protection.

In the last ten years, governments and organisations have been paying increasing attention to environmental protection and climate change actions, thanks also to the pressure coming from citizens and civil society at large. They integrated environmental policies into their political agendas and set them as a top priority for the future. On 12 December 2015, 196 countries adopted the Paris Agreement, a legally binding international treaty on climate change, whose goal is to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels. The Paris Agreement is a landmark in the multilateral climate change process because, for the first time, a binding agreement brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects (UNFCCC, 2015).

5.1.1. Objectives of the chapter

The chapter updates and deepens the analysis in the area of environmental protection and climate change covered by the previous edition: government spending on environmental protection, land and ecosystems, water resources, air quality, greenhouse gas emissions in Europe, and energy resources. In addition to these areas, this chapter benchmarks new ones, enriching the analysis and providing more inputs for the cross-country performance comparison of 35 countries (27 European Union Member States, as well as the United Kingdom, Norway, Iceland, Switzerland, Australia, New Zealand, Canada and the United States).

5.1.2. Data and Methodology

A broad range of indicators can be grouped under the umbrella notion of environmental protection, ranging from sustainability and climate change to indicators that are more related to citizens' immediate residential environments. The indicators for environmental protection chosen in this chapter focus on air quality, water resources, waste management, energy, biodiversity and landscapes as well as citizens' perceptions of climate change and environmental policy. Single indicators measure the characteristics of separate elements of the conceptual framework, ratio indicators measure the relationship of elements (Van Dooren, 2015). The distinction between single and ratio indicators corresponds with the grouping of research objects. Single indicators measure performance based on isolated concepts whereas ratio indicators measure performance of related concepts. The specificity of outputs and outcomes depends on the theme and section addressed in this report, and the connection between input, output and outcome is discussed per section (performance analysis of a particular issue).

The study in this chapter adopts two main data collection methods: qualitative (e.g. document analysis and literature review) and quantitative (e.g. descriptive statistics and two-way correlations). The first method was useful for gathering the data underlying input, output and outcome indicators, while the second one underlines the performance analysis.

5.1.3. Outline

The chapter first provides an overview of the inputs used by the countries for environmental protection purposes, by focusing on environmental protection expenditure, environmental policy stringency index and environmental transfers. In the subsequent sections, it reflects on countries' performance on the themes of air quality, water resources, waste management, energy, biodiversity and landscapes as well as citizens' perception of climate change and environmental policy. The chapter ends with some conclusions and reflections on best-performing countries per investigated theme.

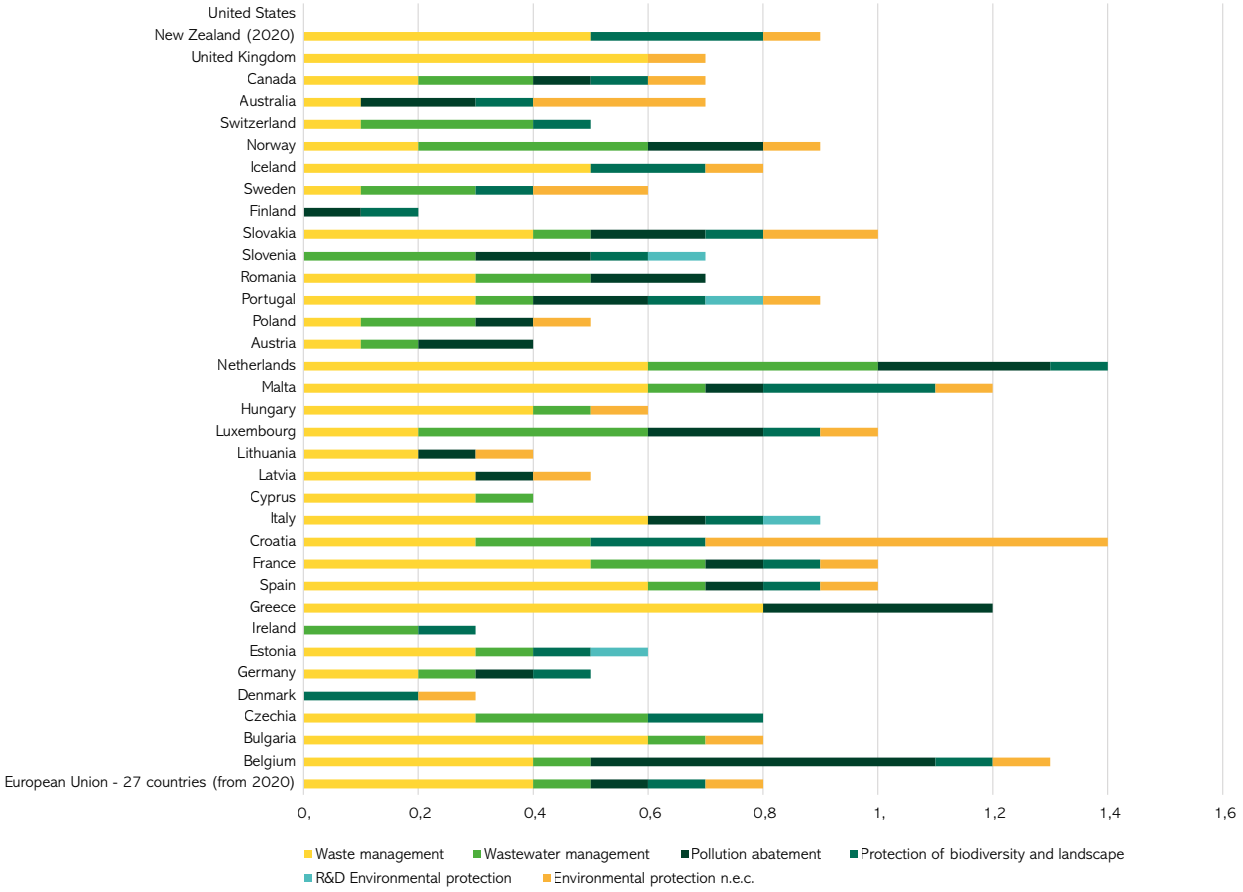
5.2. INPUTS

In line with the theoretical framework, input refers to monetary and non-monetary resources which are essential for carrying out activities which result in certain outcomes. In this section, we present data on input indicators essential for managing the environmental protection and climate change policy domain.

5.2.1. Environmental protection expenditure

The first indicator is the general government total expenditure measured as the share of total Gross Domestic Product (GDP) spent on environmental protection (including per different themes) in 34 countries (no data available for the United States) compared with each other. General government expenditure on environmental protection can be divided into expenditure on waste management, wastewater management, pollution abatement, protection of biodiversity and landscape, R&D environmental protection and environmental protection. Overall, according to the latest available data for 2021, the total expenditure of the general government on 'environmental protection' in the European Union amounted to a modest 0.8% of GDP (Figure 1). Of this, expenditure on 'waste management' amounted to 0.4 % of GDP, expenditure on 'wastewater management' 0.2% of GDP, while 0.1% of GDP was devoted to expenditure in each of the following groups: 'pollution abatement', 'protection of biodiversity and landscape' and expenditure not elsewhere classified (n.e.c.) relating to environmental protection.

Figure 1: Total general government expenditure on "environmental protection", 2021 (% of GDP)



Source: Eurostat and International Monetary Fund climate data

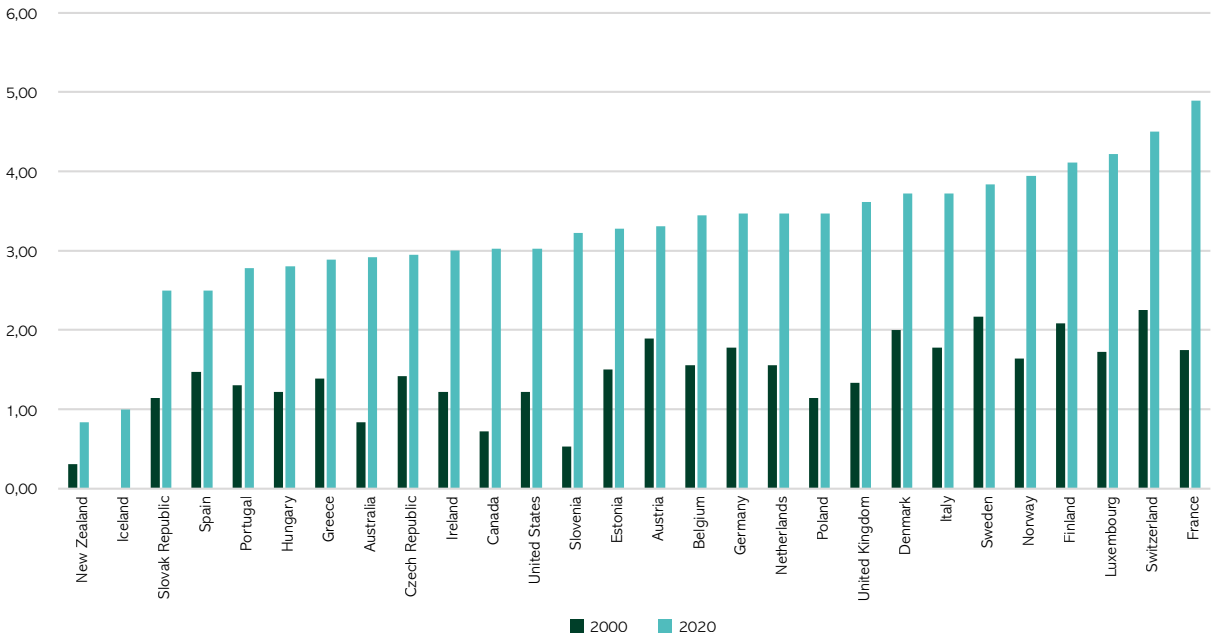
For EU countries, as well as Iceland, Norway, Switzerland, Australia, Canada, New Zealand, United Kingdom, expenditure on 'environmental protection' ranged between 0.2% of GDP and 1.5% of GDP in 2021. In 2021, Croatia devoted the highest ratio of GDP to 'environmental protection' (1.5% of GDP), followed by the Netherlands (1.4% of GDP), Belgium and Malta (1.3% of GDP each) and Greece (1.2% of GDP). In Croatia, 0.7% of GDP was used on 'environmental protection n.e.c.' and 0.3% on 'waste management'. In the Netherlands, 0.6% of GDP was spent on 'waste management' and 0.4% on ' wastewater management'. In Belgium, 0.4% of GDP was spent on 'waste management' and 0.6% on 'pollution abatement'. In Malta, 0.6 % of GDP was spent on 'waste management' and 0.3% of GDP on 'protection of biodiversity and landscape'. Greece spent the highest ratio of GDP on 'waste management' among EU countries amounting to 0.8% of GDP. At the other end of the scale, for 2021, Finland devoted a ratio of 0.2% of GDP to environmental protection expenditure followed by Ireland with 0.3% of GDP. The highest ratios of GDP for 'wastewater management' was spent by Luxembourg, the Netherlands and Norway (0.4% of GDP), followed by Czechia, Slovenia and Switzerland (0.3% of GDP). Belgium reported the highest ratio in the EU for 'pollution abatement' (0.6% of GDP), followed by Greece (0.4% of GDP). For both countries, this is largely due to tax subsidy schemes for renewable energy. For the 'protection of biodiversity and landscape', Member States devoted between 0.3% and 0.1% of GDP or less than this. In 2021, Malta was the country that had distinctly the largest expenditure in this function (0.3% of GDP). The expenditure on research and development (R&D) related to environmental protection was very low in all Member States in 2021 (0.1% of GDP or less) (Eurostat, 2023).

Overall, considering the evolution of environmental protection expenditure, over the period 1995-2021, EU expenditure on environmental protection remained relatively stable, ranging between 0.7% of GDP and 0.9% of GDP. Its share in total expenditure also remained relatively stable, varying between 1.4% and 1.7% of total expenditure. In addition, the EU budget makes an important contribution towards the fight against climate change. Throughout the 2014-2020 multiannual financial framework, the EU delivered on its ambition of spending 20% of available funds on climate-related measures. In the period 2021-2027, the EU budget and the NextGenerationEU funds have a target of 30% climate expenditure (EU, 2022).

5.2.2. Environmental Policy Stringency Index

The OECD Environmental Policy Stringency Index (EPS) is a country-specific and internationally-comparable measure of the stringency of environmental policy. Stringency is defined as the degree to which environmental policies put an explicit or implicit price on polluting or environmentally harmful behaviour (OECD, 2016). The substantial increase in the EPS on average across the OECD over the past decades shows wide heterogeneity across countries. Figure 2 shows countries according to their EPS in 2000 (blue bars) and 2020 (orange bars). All countries increased their environmental policy stringency between 2000 and 2020. In 2020, the countries with the most stringent environmental policies were France, Switzerland, Luxembourg and Finland (Figure 2).

Figure 2: Environmental Policy Stringency Index in 2000 and 2020



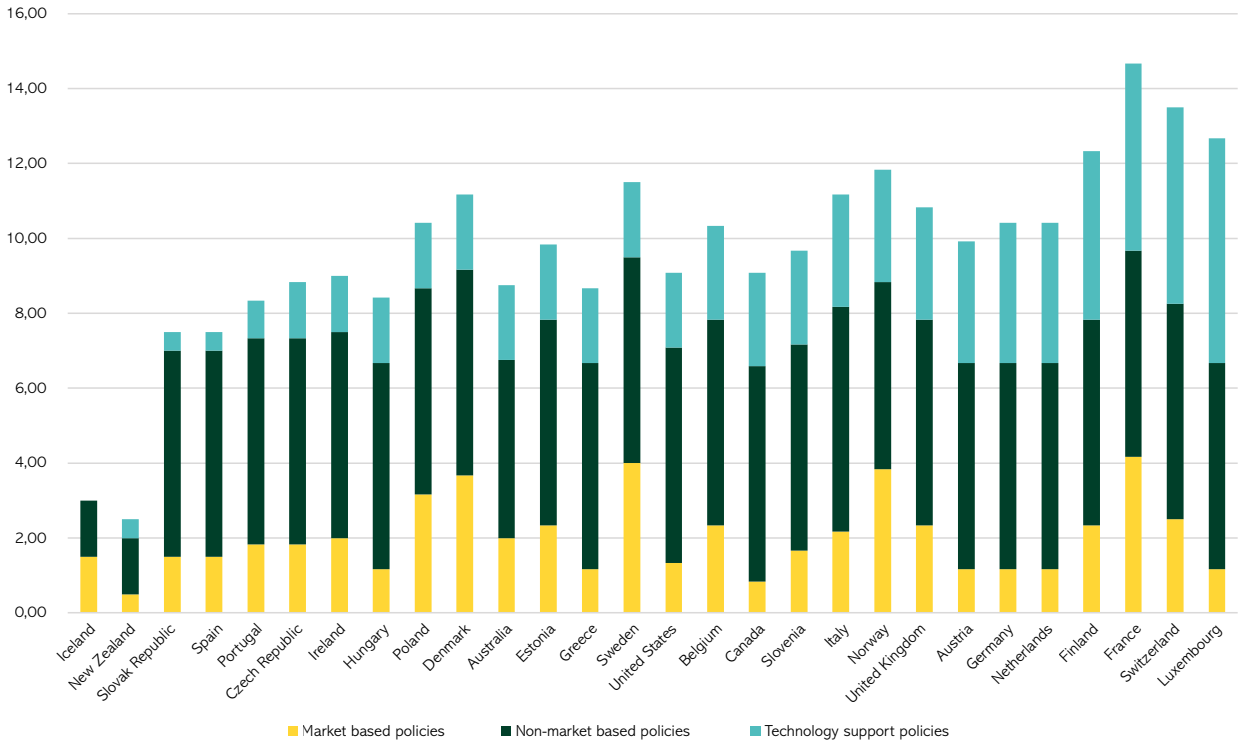
Source: OECD

Some countries strengthened their environmental policies more than others. Looking at the changes in absolute values of the EPS score, France (+3.2), and Slovenia (+2.8) increased their policy stringency the most (between 2000 and 2020). While the environmental policy stringency in some countries increased vastly, several countries (e.g. Hungary or Slovak Republic) also started from a low basis, so their policy stringency remains at a relatively low level.

In addition, the EPS index consists of three equally-weighted subindices, which respectively group market-based (e.g. taxes, permits and certificates), non-market-based (e.g. performance standards) and technology support policies. While the stringency of environmental policies has on average increased substantially over the past three decades across OECD countries, the rate of increase in the EPS has slowed down over the past decade. The stringency of non-market-based policy instruments has increased the most in absolute terms, followed by technology support policies and market-based policies. The initiation of emissions trading schemes across several countries since the early 2000s has contributed to the increase in the stringency of market-based policies. Nevertheless, the scope for greater pricing of emissions remains large in the majority of countries (Kruse et al., 2022).

Over the past ten years, the level of technology support policies has weakened, raising concerns that incentives to innovate in clean technologies may be declining. While the declining trend may partly capture a shift towards more efficient technology support policies, the vast need for innovation and investment in green technologies requires a further increase in technology support policies (Kruse et al., 2022). Figure 3 shows that in most countries in 2020 the EPS score of non-market-based environmental policies is highest, followed by technology support policies and market-based policies.

Figure 3: Environmental Policy Stringency by sub-indicator across countries in 2020



Source: OECD
Note: The graph shows the contribution of the policy components to the EPS across countries for the year 2020.

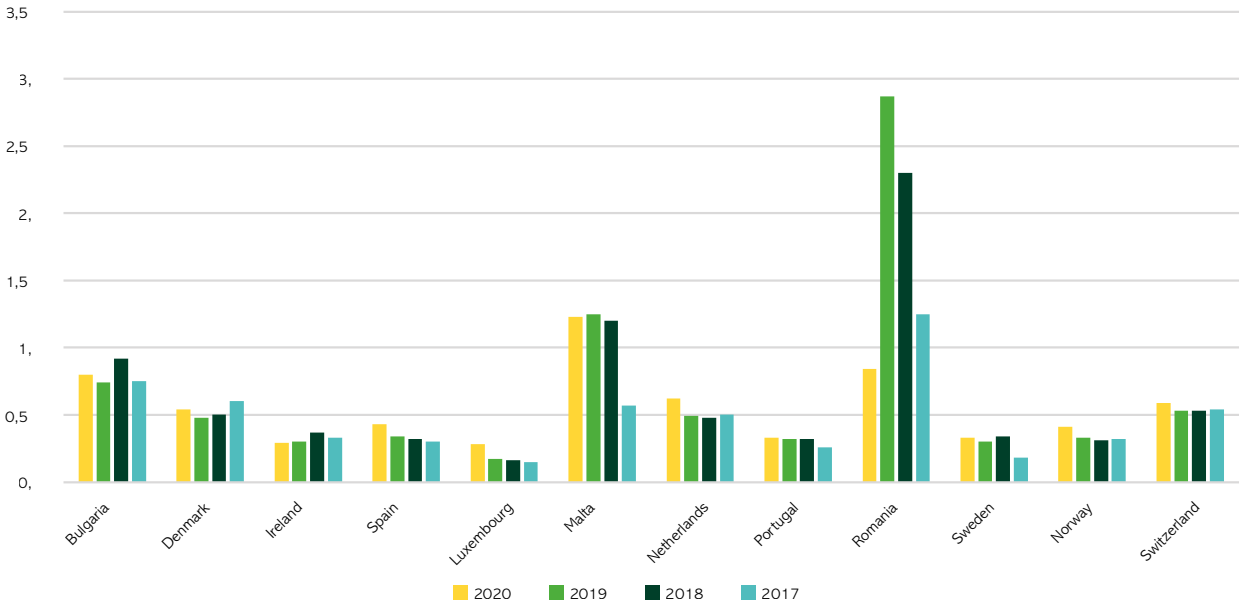
5.2.3. Environmental transfers

In this chapter environmental transfers are understood as payments whenever the purpose is to protect the environment or manage natural resources, such as for installing cleaner energy or for keeping nature reserves, or for research on environmental issues. The public subsidies and other payments related to the environment in the EUcountries ranged between 0.3% and 1.2% of their GDP in 2020, specifically, financing received by corporations, households, or public authorities and paid by the public administrations of the country or from abroad (including EU funds).

For the 13 countries reporting 2020 data to Eurostat, environmental transfers range from 1.2% of GDP in Malta to 0.8% in Romania and Bulgaria, down to 0.3% in Sweden, Portugal, Ireland and Luxembourg (Figure 4). These estimates come from a Eurostat voluntary data collection and data are only available for some countries (Eurostat, 2023).

In 2019, environmental transfers as a percentage of GDP reached their highest level in Lithuania, Malta and Romania. These countries presented a similar trend over recent years, with a continuous increase until 2019 and a decrease in 2020. Romania had the highest share of GDP over the period 2017 to 2019, increasing from 1.3% to 2.9% of GDP. However, in 2020, environmental transfers amounted to 0.8% of GDP in Romania. In 2020, environmental transfers reached their maximum percentage in Spain, Luxembourg, the Netherlands, as well as in Norway and Switzerland, within a range of 0.3% to 0.6% of GDP. On the other hand, Bulgaria and Ireland recorded the highest percentage in 2018 (Figure 4) with, respectively, 0.9% and 0.4% of GDP.

Figure 4: Total environmental transfers received by the national economy as percentage of GDP (%), years 2017-2020



Source: Eurostat

In addition, eight EU countries report also the source of environmental transfers. In Denmark, Ireland, Spain, Malta and Sweden, the general government contributes to more than 80% of the environmental transfers received in the country; the remaining share is incoming international flows (including EU funds). In Bulgaria, Lithuania, Portugal and Romania, the contribution by other countries and the EU is larger than the contribution by the general government: from 80% in Bulgaria to slightly more than 50% in Portugal (Eurostat, 2023).

Outputs & outcomes
In line with the conceptual framework, we define output as anything that comes out of a system being the result of input processing (EIPA, 2022). Output might be used immediately or be readily available for use by citizens in the future. Outcome, on the other hand, goes beyond output i.e. the societal, economic and political results relevant to the environmental policy area.

5.3. AIR QUALITY

Air pollutants are emitted by a large range of economic activities (and from some natural sources). They can affect air quality far away from the source, and local effects also depend on local conditions. Overall, air pollution is the single largest environmental health risk in Europe and beyond. Considerable progress has been made in recent years in improving urban air quality, but issues remain. Although emissions of air pollutants have declined, almost 20% of the EU's urban population lives in areas with concentrations of air pollutants above at least one EU air quality standard (SOER, 2020). Exposure to fine particulate matter is responsible for around 400,000 premature deaths in Europe every year, and Central and Eastern European countries are disproportionately affected. Overall, the emissions of most main air pollutants decreased in Europe between 2005 and 2020. This decrease did not happen at the same pace in all countries and regions and not in all sectors.

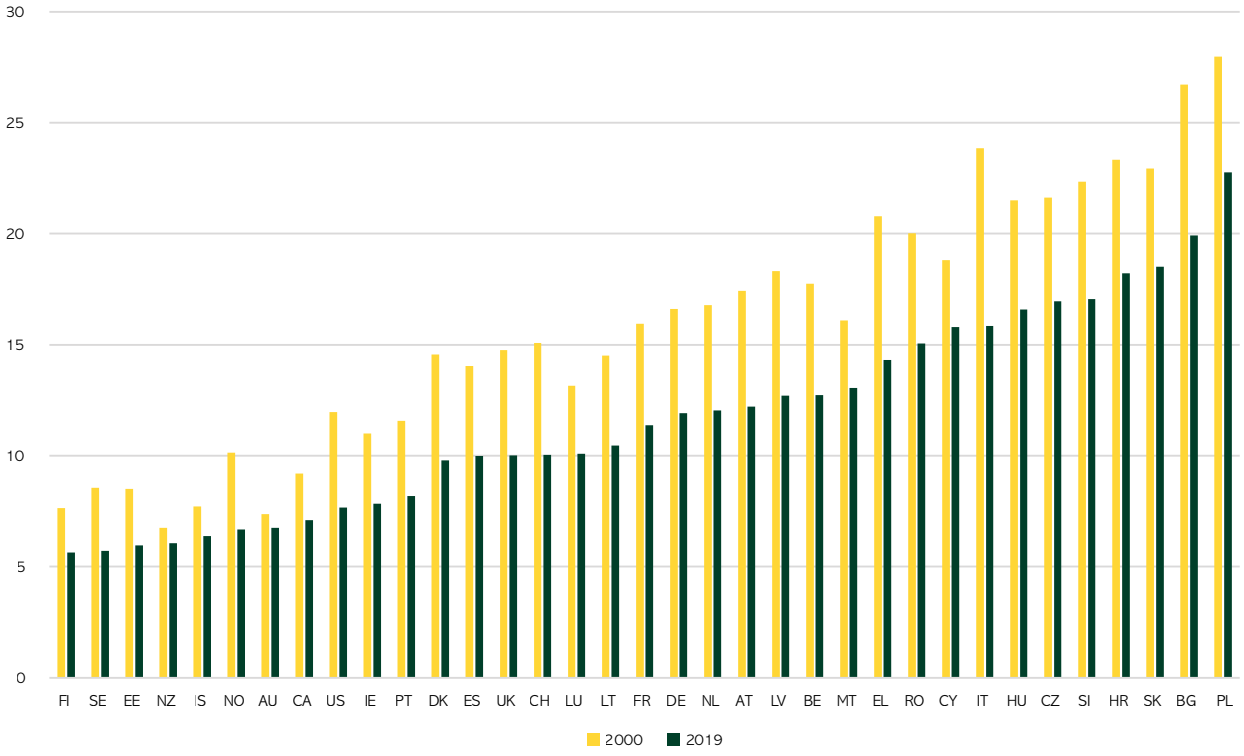
5.3.1. Exposure to PM2.5 fine particles and other trends in air pollutant emissions

Fine particulate matter (PM2.5) is the air pollutant that poses the greatest risk to health globally, affecting more people than any other pollutant. Chronic exposure to PM2.5 considerably increases the risk of respiratory and cardiovascular diseases in particular. Data refer to population exposure to more than 10 micrograms/m^3 and are expressed as annual averages.

From 2000 to 2019, emissions of particulate matter with a diameter of 2.5 microns (µm) or less (PM2.5) have decreased in the reporting countries (Figure 5), due to optimised combustion processes, a decline of coal in the energy mix, and lower emissions from transport and agriculture (SOER, 2020). A decrease in PM2.5 emissions was observed in all EU countries, as well as the United Kingdom, Norway, Iceland, Switzerland, Australia, New Zealand, Canada and the United States (Figure 5). However, for EU countries, the exposure to PM2.5 in Poland (22.8 µg/m^3) continued to be above the exposure concentration obligation of 2015 (20 µg/m^3). Overall, the primary source of particulate matter PM2.5 in 2020 was the energy consumption in the residential, commercial and institutional sectors responsible for 58% of emissions (SOER, 2020). The manufacturing and extractive industry and the road transport sector were also significant sources of the pollutant.

Furthermore, ammonia (NH_3) had the lowest reduction in emissions of only 8% from 2005 to 2020. Ammonia is an important precursor gas that contributes to the formation of secondary particulate matter. Also, emissions of methane (CH_4) declined by only 17%. CH_4 is a potent greenhouse gas that drives climate change and is also an ozone (O3) precursor. The main source of both NH_3 and CH_4 emissions is the agriculture sector (SOER, 2020). By contrast, emissions of sulphur dioxide (SO_2) fell significantly from 2005 to 2020, with a decrease of 79%. This was mainly due to the reduced use of coal over that period. Major reductions were also seen for nitrogen oxides (NO_X), black carbon (BC), carbon monoxide (CO) and non-methane volatile organic compounds (NMVOCs), with declines of 48%, 46%, 42% and 31%, respectively (SOER, 2020).

Figure 5: Exposure to PM2.5 fine particles in 2000 and 2019 (micrograms per cubic metre)



Source: OECD.
Notes: The bars show population exposure to more than 10 micrograms/m^3 of PM2.5 fine particles in reporting countries and are expressed as annual averages for 2000 and 2019. The horizontal red line represents the exposure concentration obligation for the EU-28, set at 20 µg/m^3, to be achieved by 2015.

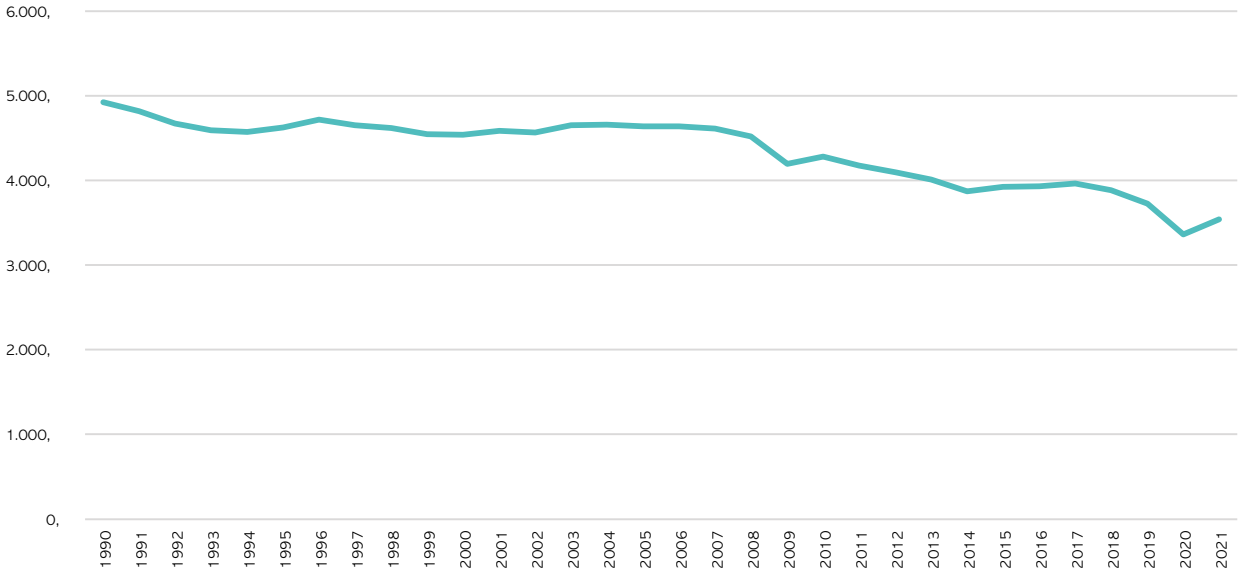
5.3.2. Greenhouse gas (GHG) emissions

Climate change poses a significant threat to sustainable development. Extensive research has led the scientific community to reach a consensus that human activities, particularly the emission of greenhouse gases (GHGs), are the primary cause of the Earth's rising average temperatures over the past 250 years (IPCC, 2014). These GHG emissions are primarily generated through the burning of fossil fuels in power plants, vehicles, and residential heating, while agricultural practices and waste decomposition in landfills also contribute to GHG emissions. Extensive reduction of

greenhouse gas emissions is at the core of policies aimed at preventing climate change due to global warming. The EU has formulated ambitious targets to achieve a 55% CO2 emission reduction by 2030 and reach climate neutrality by 2050. Both targets are underpinned by the European Climate Law. This presents a considerable challenge for national governments, often referred to as the need for an 'energy transition' toward renewable energy.

The net GHG emissions indicator measures total national emissions, including carbon dioxide (CO2), methane (CH_4), nitrous oxide (N2O), and the so-called F-gases (hydrofluorocarbons, perfluorocarbons, nitrogen trifluoride (NF3) and sulphur hexafluoride (SF6)) from all sectors of the GHG emission inventories (including international aviation and indirect CO2). In the European Union (EU), greenhouse gas emissions experienced a steady decline from 2010 to 2014, followed by a slight increase between 2015 and 2017. However, emissions dropped again from 2018 to 2020. Notably, in 2020, emissions saw a significant decrease of over 10% compared to 2019, marking the sharpest drop since 1990. The large drop was strongly related to the COVID-19 pandemic, but the magnitude of this effect is uncertain in comparison with the role of climate policies. EU GHG emissions in 2020 were more than 1,500 million tonnes of CO2 equivalent lower than in 1990, resulting in a reduction of 32% compared to 1990 levels (Figure 6). This surpassed the EU's reduction target of 20% by 2020. However, the latest data for 2021 showed GHG emissions almost reaching pre-pandemic 2019 levels after a temporary reduction during the COVID lockdown. In the EU, total GHG emissions increased by 6.5% in 2021. However, this increase is about half of the reduction that took place between 2019 and 2020 (-10.8%). Consequently, EU27 emissions fell by 5% between 2021 and 2019, continuing a downward trend. The new target for 2030 is a 55% reduction in GHG emissions compared to 1990 levels.

Figure 6: Greenhouse gas emissions (including international aviation, excluding LULUCF), trend, EU-27, 1990-2021, million tonnes



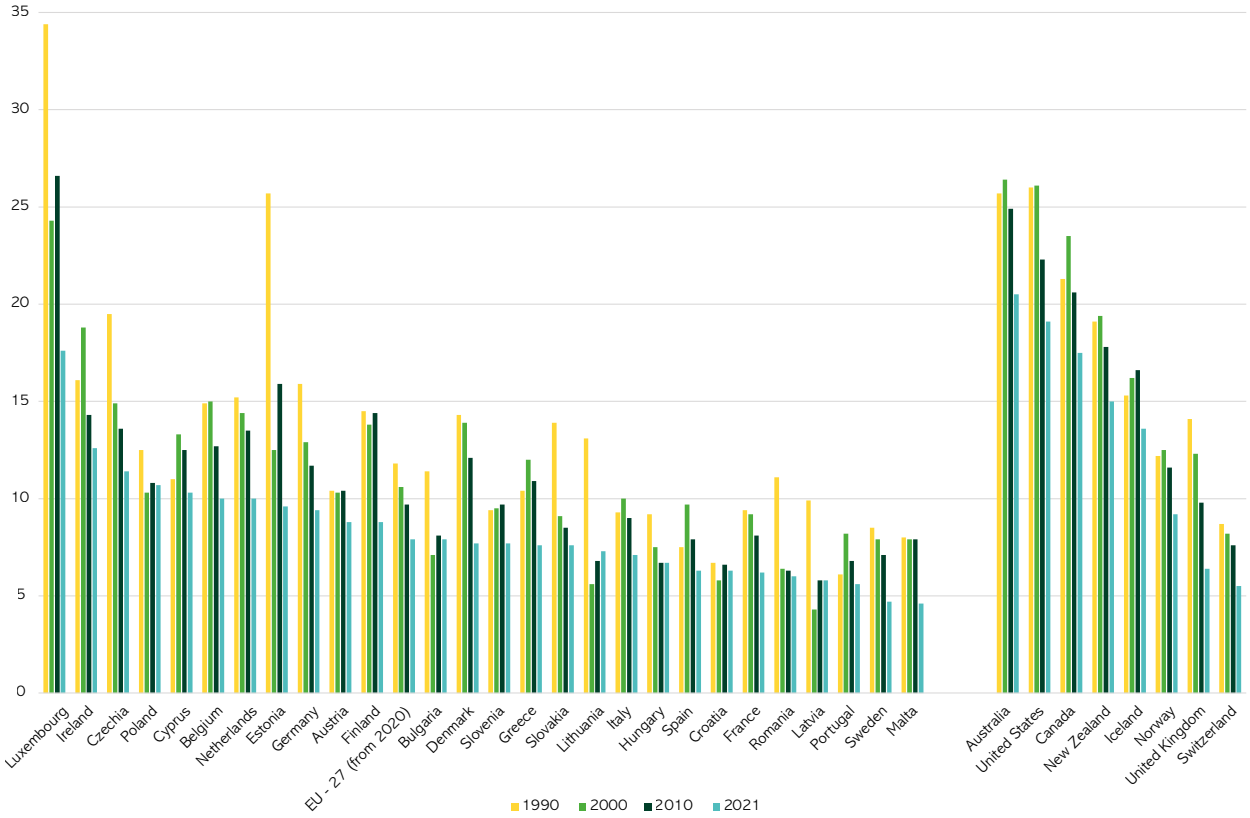
Source: Eurostat

Notably, GHG emissions were below 1990 levels in 25 EU Member States. Estonia, Latvia, Lithuania, and Romania achieved the largest reductions of over 50%. Czechia, Germany, Ireland and Luxembourg still had relatively high GHG emissions per capita (Figure 7). In 2021, Sweden recorded one of the lowest (second to Malta) levels of GHG per capita (4.7 tonnes) in the EU. This is explained by Sweden's reliance on clean energy sources, including hydro, wind and nuclear power; renewable sources contributed to roughly two-thirds of electricity generation[1]. In turn, in 2021, Luxembourg recorded the highest per capita GHG emissions level (17.6 tonnes) in the EU, mainly due to the transport sector. The latter accounts for roughly half of all emissions, and the high values are partly explained by the fact that Luxembourg is a main transit country[2].

[1] *Statista: Carbon dioxide emissions in Sweden 1970-2022.*

[2] *European Parliamentary Research Service, Climate action in Luxembourg 2021.*

Figure 7: Net greenhouse gas emissions in tonnes per capita (excl. LULUCF and incl. international aviation)



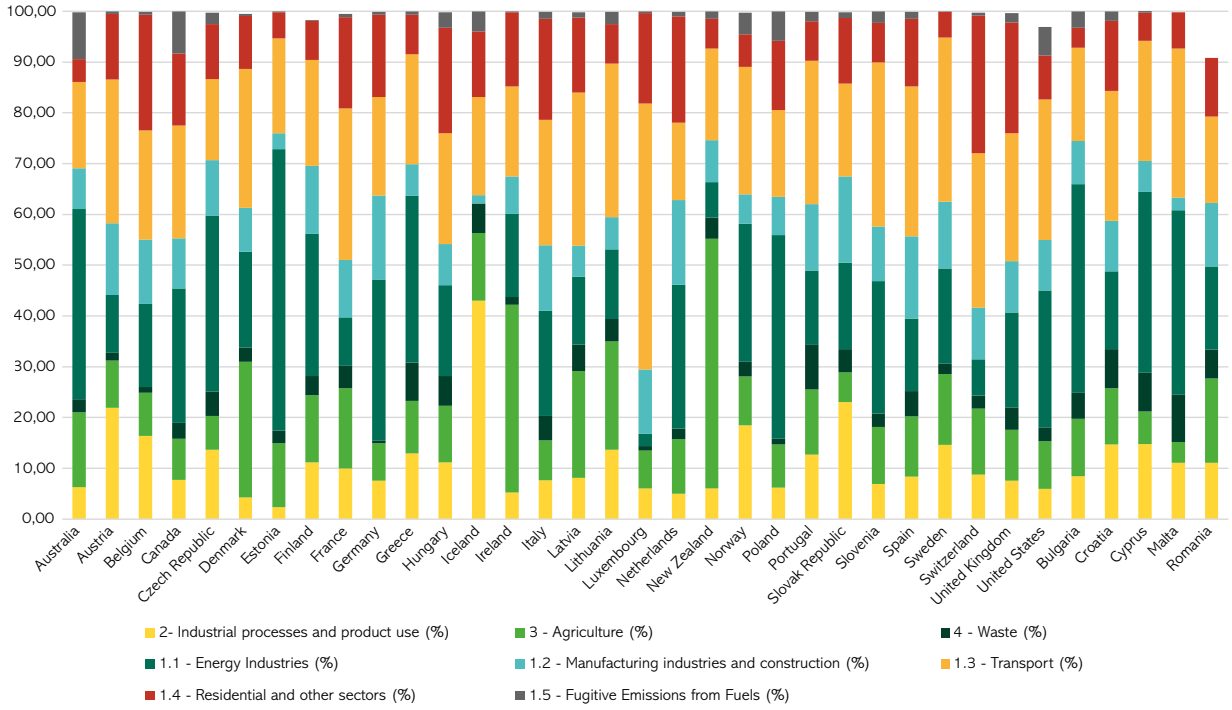
Source: Eurostat and OECD

Among the non - EU countries, Australia, Canada, New Zealand and the United States also produced high GHG emissions per capita according to the data of 2020. However, as shown on Figure 7, the GHG emissions declined considerably in most of the reporting countries between 1990 and 2021. Overall, the total greenhouse gas (GHG) emissions excluding land use, land use change and forestry (LULUCF) and including international aviation declined by 1.2 billion tonnes of carbon dioxide equivalent (CO2e) between 1990 and 2020. This represents a reduction of 22% in the past 27 years.

5.3.3. Greenhouse gas (GHG) emissions by source

One of the key contributors to the GHG emissions in 2021 was the energy industry, followed by transport, manufacturing industries, agriculture, industrial processes and waste (Figure 8). At the same time, the sources of GHG emissions by the reporting countries varied considerably. These differences are, in part, due to different economic structures and different mixes of renewable and non-renewable energy sources. In Australia, the supply of electricity topped the GHG emissions by 33%, in 2021. The oil and gas sector was the largest source of GHG emissions in Canada, accounting for 28% of total national emissions. In Luxembourg, Slovenia, Sweden and Switzerland, emissions from transport account for more than 30% of total emissions. The United Kingdom and the United States also reported the highest share of GHG emissions in transportation, with 26% and 28% respectively. In New Zealand and Ireland, agriculture counted toward the total national emissions by over 30%. According to the data for 2021, the main sources of GHG emissions in the Netherlands were the energy sector (28%), followed by residential (20.93%), manufacturing industries and construction (16.65%) and transport (15.25%).

Figure 8: GHG emissions in 2021 by source (%)



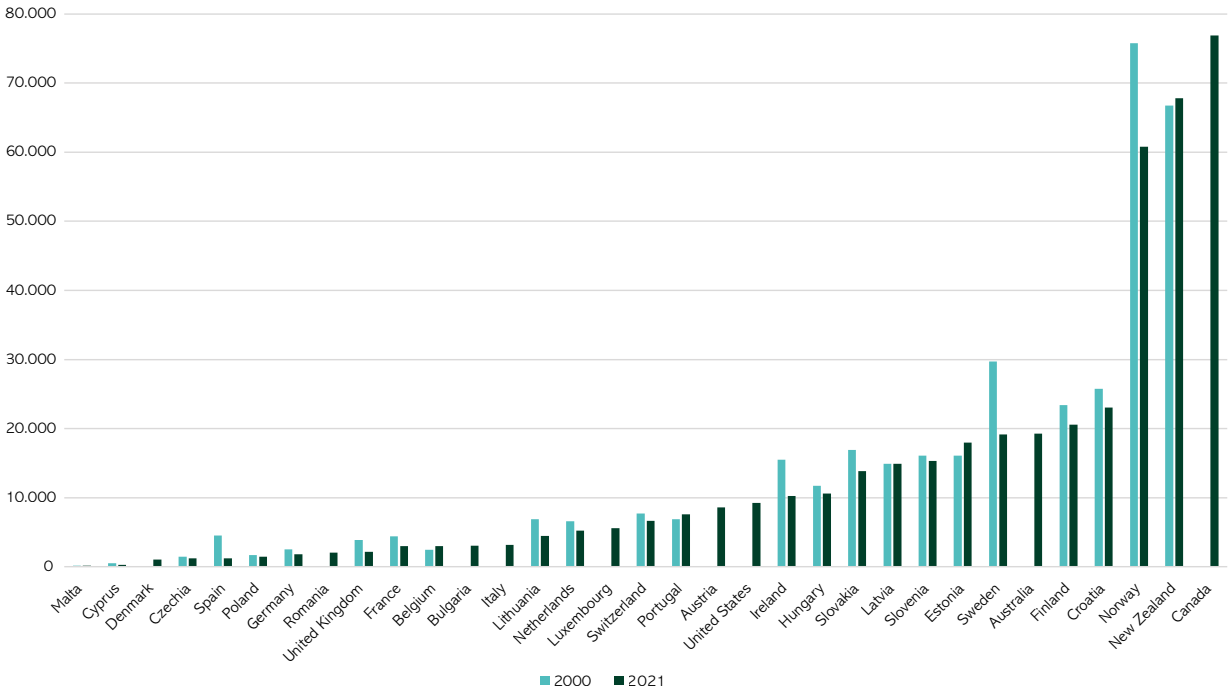
Source: OECD

5.4. WATER RESOURCES

5.4.1. Renewable water resources

Renewable water resources (internal and external) include the average annual flow of rivers and recharge of aquifers generated from endogenous precipitation and those water resources that are not generated in the country, such as inflows from upstream countries (groundwater and surface water), and part of the water of border lakes and/or rivers. Renewable water resources are expressed in flows calculated as the sum of internal flow (which is precipitation minus actual evapotranspiration) and external inflow. Therefore, freshwater availability in a country is primarily determined by climate conditions and transboundary water flows (external inflow), while for total amounts, the size of the country matters. Several countries receive a significant proportion of their renewable freshwater resources as external inflow. Among the EU Member States, Hungary and the Netherlands had the highest dependency on transboundary water resources, as the long-term average of external inflow accounted for 94.3% and 88.8% of their total renewable freshwater resources, respectively. On the other hand, some countries (e.g. Malta, Cyprus, Spain, Denmark, Iceland) have no or only small external inflow of water.

Figure 9: Renewable freshwater resources (cubic metres per inhabitant)



Source: Eurostat

Freshwater resources per inhabitant are considered an important indicator for measuring the sustainability of water resources. According to the data of 2021, when broken down by population, most countries' water resources range between 1,000 and 20,000 m³ per inhabitant, but in water-rich countries, an inhabitant's share can be as high as around 23,044 m³ (Croatia) or 60,789 m³ (Norway) (Figure 9). According to the World Water Development Report of the United Nations, a country experiences 'water stress' when its annual water resources are below 1,700 m³ per inhabitant (UN, 2023). Among EU Member States, this was the case in Cyprus, the Czech Republic, Poland, Romania and Malta in 2000. Romania recovered its water resources to 2,058 m³ per inhabitant in 2021, while Spain had a drop from 4,531 m³ per inhabitant in 2000 to 1,242m³ per inhabitant in 2021. Iceland is the top country in renewable water resources per inhabitant in the world (not shown on Figure 9). As of 2020, renewable water resources per inhabitant in Iceland was 498,178 m³. Renewable water resources of the Netherlands have been stable in the last two decades at around 6,000 m³ per inhabitant.

5.4.2. Water abstraction

Water storage and abstraction places considerable pressure on the environment. While the water used is less than the amount abstracted because some water is returned to the environment, scarcity still occurs in parts of Europe, both in the summer and in the winter (SOER, 2020). The underlying causes of water scarcity, expressed by the water exploitation index, differ. In Western Europe, it is primarily linked to cooling water needed for energy production and industry, while in Southern Europe water scarcity is linked to agriculture.

There are considerable differences in the amounts of water abstracted within EU countries, in part reflecting the size of each country and the resources available, but also abstraction methods, climate and the industrial and agricultural practices of each country. Overall, Europe's water abstraction of 243,000 million cubic meters can be split among four main sectors: household water use (14%); industry and mining (18%); cooling water for electricity production (28%); and agriculture (40%). However, geographically there are considerable differences in the sectors using more water. In Western Europe public water supply, cooling water and mining are responsible for the majority of water abstraction, whereas in Southern Europe agriculture uses the largest share (SOER, 2020). As shown in Table 1, between 2000 and 2020 the total volume of freshwater abstracted rose the fastest in Denmark (+34.5%) and Serbia (+40.4%). The largest decreases were reported by Lithuania (-82.6%), due to a reduction in cooling water needs in electricity production), Slovakia (-50.9%), Belgium (-44.6%) and Estonia (-42.3%).

Table 1 also shows the considerable differences between EU Member States as regards the ratio between abstractions from groundwater and surface water resources. Among the EU Member States, surface water abstraction accounted for around eight times the volume of water abstracted from groundwater resources in Romania (2020 data) and Bulgaria (2019 data) and approximately six times in the Netherlands (2019 data). On the other hand, the volume of water abstracted from groundwater resources was around 13 times as high as the volume of surface water abstraction in Malta (2020 data) and 3.6 times in Denmark (2020 data) (Eurostat, 2023).

Table 1: Total water abstraction, 2000 and 2020

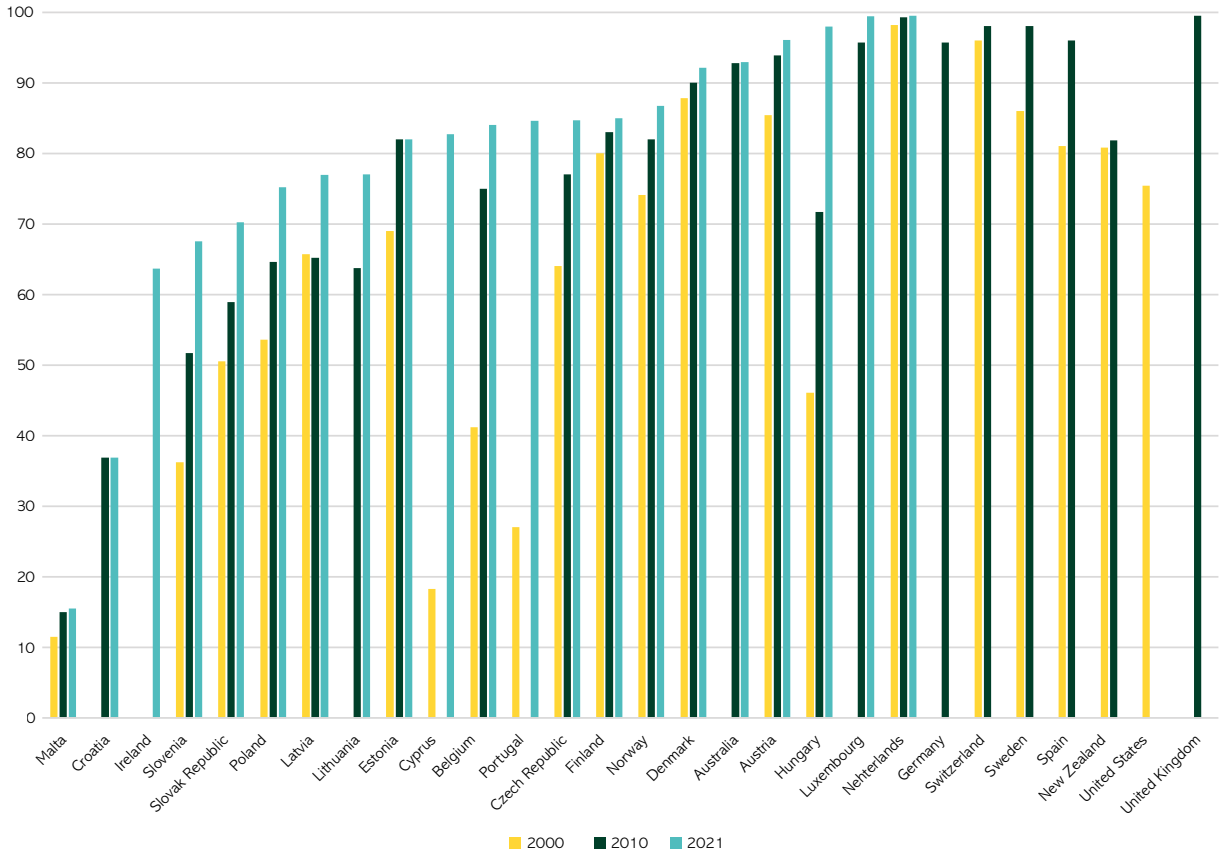
TIME	2000	2020	2000	2020
GEO (Labels)	Fresh surface water		Fresh groundwater	
Belgium	6.840,38	:	664,69	633,59
Bulgaria	5.337,53	4.515,49	794,72	561,39
Czechia	1.363,20	1.011,00	554,80	354,90
Denmark	17,00	212,46	709,10	763,97
Estonia	1.216,30	626,44	254,60	221,59
Greece	6.471,00	3.898,70	3.453,40	6.223,38
Spain	30.572,30	23.618,60	5.965,30	5.827,30
France	26.456,11	19.034,28	6.259,34	5.885,07
Croatia	255,07	254,24	430,40	403,89
Cyprus	49,50	96,40	146,00	135,00
Latvia	168,47	97,08	117,21	84,13
Lithuania	2.111,38	239,75	189,92	161,43
Luxembourg	:	24,48	:	23,26
Hungary	:	3.521,00	740,00	624,35
Malta	2,62	2,96	36,85	38,25
Netherlands	:	7.135,00	:	1.171,00
Austria	:	:	:	:
Poland	9.150,60	6.667,86	2.843,20	2.497,72
Romania	6.860,00	6.593,00	1.107,00	796,00
Slovenia	:	817,99	:	183,90
Slovakia	723,10	240,90	448,40	334,50
Finland	:	:	284,70	:
Sweden	2.053,00	2.089,00	635,00	395,00

Time frequency: Annual
Water process: Total gross abstraction
Water sources: Fresh groundwater
Unit of measure: Million cubic metres

5.4.3. Wastewater treatment

Overall, there is a development toward a higher proportion of the population being connected to wastewater treatment. Figure 10 presents information on the share of the population connected to at least secondary wastewater treatment plants, which typically is an acceptable level of environmental protection, unless the receiving waters are in a sensitive area. This share has been generally increasing over the past decades and was above 80% in 16 of the EU Member States as well as Australia, the United Kingdom, New Zealand and Switzerland for which recent data are available.

Figure 10: Share of the population (%) connected to a wastewater treatment plant (2000, 2010, 2021)



Source: OECD

The share of the population connected to at least secondary wastewater treatment plants rose to 95% and above by 2021 in six EU Member States (Denmark, Germany, Luxembourg, the Netherlands, Austria and Sweden, as well as Switzerland and the United Kingdom). At the other end of the range, less than one in two households were connected to at least secondary urban wastewater treatment plants only in Malta and Croatia (2020 data), while the same was also true in Iceland (2010 data). Over the period shown (2000-2021), several countries managed to achieve a drastic increase in the coverage of their wastewater treatment, e.g. Cyprus (from 18.3% to 82.7%) and Portugal (from 27.0% to 84.6%). Furthermore, the two countries with the highest share of population connected to a wastewater treatment plant by 2021, the Netherlands and Luxembourg (99.52% and 99.4% respectively) also reported the highest ratios of GDP spent for 'wastewater management' (0.4% of GDP).

The residual of wastewater treatment is sewage sludge. While the amount of sludge generated per inhabitant depends on several factors and therefore is not constant, the composition of the sludge (both rich in nutrients as well as often loaded with high concentrations of pollutants such as heavy metals) has led countries to seek different pathways for its disposal. Typically, four different types of disposal make up a considerable share of the total volume of sewage sludge treated (2020 data): more than 80% of the total was used as fertiliser for agricultural use in two EU Member States — Spain (87%, 2018 data) and Ireland (89%) (EEA, 2020). A different way of making use of the nutrients in the sludge is composting; this was prevalent with more than 50% in Finland (2019), Hungary (2019) and Cyprus (2018). Alternative forms of sewage disposal may be used to reduce or eliminate the spread of pollutants on agricultural or gardening land; these include incineration and landfill. As there are more and more environmental concerns about the latter, incineration is increasingly the method of choice: while the Netherlands (96%), Belgium (75%, provisional data), Germany (74%, 2019 data), Austria (52%), Greece (37%, 2019) and Luxembourg (34%, estimated) reported incineration as their principal form of treatment for disposal, discharge into controlled landfills was practised as the principal type of treatment only in Malta and Romania (SOER, 2020).

5.5. WASTE MANAGEMENT

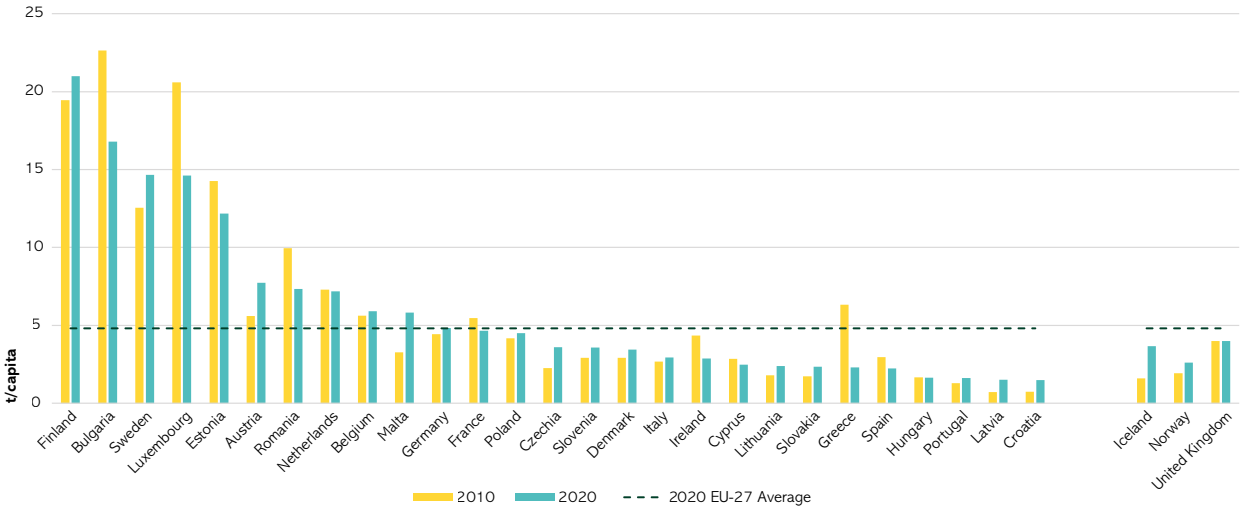
5.5.1. Waste generation

Urbanisation, population growth, and economic development naturally result in waste generation. The European Union has focused on preventing waste generation, which is the first step in the EU Waste Framework Directive's hierarchy. Between 2010 and 2020, per capita waste generation in the EU decreased by 4.2%, or 209 kg/per capita. When major mineral wastes are excluded, per capita waste generation increased by 1.4%, or 25 kg/per capita. Although major mineral wastes like hard rocks, concrete, and soils constitute a significant proportion of total waste generation, amounting to 64% in 2020, they are typically of less environmental concern than other waste types. According to Eurostat, data on the generation of waste includes hazardous and non-hazardous waste from all economic sectors, households, and waste treatment, but it excludes most mineral waste. The latter mainly results from construction, demolition and mining activities, and varies substantially in importance across EU countries. The exclusion of major mineral wastes improves comparability across countries given general trends.

The decrease in total waste generation observed in the EU is largely driven by the mining, quarrying and construction sectors, given that major mineral waste constitutes a large portion of total waste generation. Excluding this type of waste reveals that the trend in waste generation is led by decreases in waste generation in the manufacturing and energy sectors and increases in waste generated by households, water and waste treatment activities. The latter may indicate improvements in waste management since the increased presence of secondary waste from waste management suggests an increase in recycling.

On average, 4.8 tonnes/per capita of total waste were generated in the EU in 2020, down from 5.2 tonnes/capita in 2010. However, there are considerable differences in absolute waste volumes per capita and waste generation trends between EU member states and other European countries. The amounts ranged from less than 1.5 tonnes/per capita in Portugal to 21 tonnes/per capita in Finland in 2020 for EU member states, and from 2.6 tonnes/per capita in Norway to 2.9 tonnes/per capita in Iceland, and 4.3 tonnes/per capita in the United Kingdom. Differences partly reflect the varying structures of countries' economies, and extreme figures can be influenced by specific country situations. For instance, the figures for Finland and Bulgaria were mainly impacted by the role of large industrial and economic activities. In Bulgaria's case, the high figures are explained by the building of infrastructure for energy, fuel, water supply, sewerage and waste management services in the period 2008-2018 (EEA, 2023).

Figure 11: Generation of waste, excluding major mineral waste in tonnes per capita and by European country 2010-2020



Source: Eurostat. Note: UK figures based on OECD data available for 2018

Trends over time show a mixed picture between countries (Figure 11). Total waste generated per capita increased in 16 EU member states and decreased in the others. Greece saw the largest relative decrease, from 6.3 tonnes/per capita in 2010 to 2.7 tonnes/ per capita in 2020. By contrast, Latvia experienced the largest relative increase, from 0.7 tonnes/per capita in 2010 to 1.5 tonnes/per capita in 2020. For instance, in Latvia's case, the trends indicate an increase in waste generation per capita, as well as an increase in recycling rates. Luxembourg registered an increase of over 100 kilograms of municipal waste per capita in the period 2015-2020. In turn, the implementation of the first waste prevention program in the Netherlands (2013) led to a steady decrease in municipal waste generation, which alternated with a slight increase in total waste generation due to recycling and processing activities. In some cases, the trends were affected by improvements in data quality over time.

The EU aims to decrease its total waste generation significantly by 2030, and the observed decrease may indicate progress towards this goal. However, the decrease is recent (2018-2020) and coincides with the slowdown of the EU economy due to the COVID-19 pandemic. Since waste generation tends to follow economic growth trends closely, substantial additional effort is required to sustain the decrease in waste generation in the context of a return to economic growth.

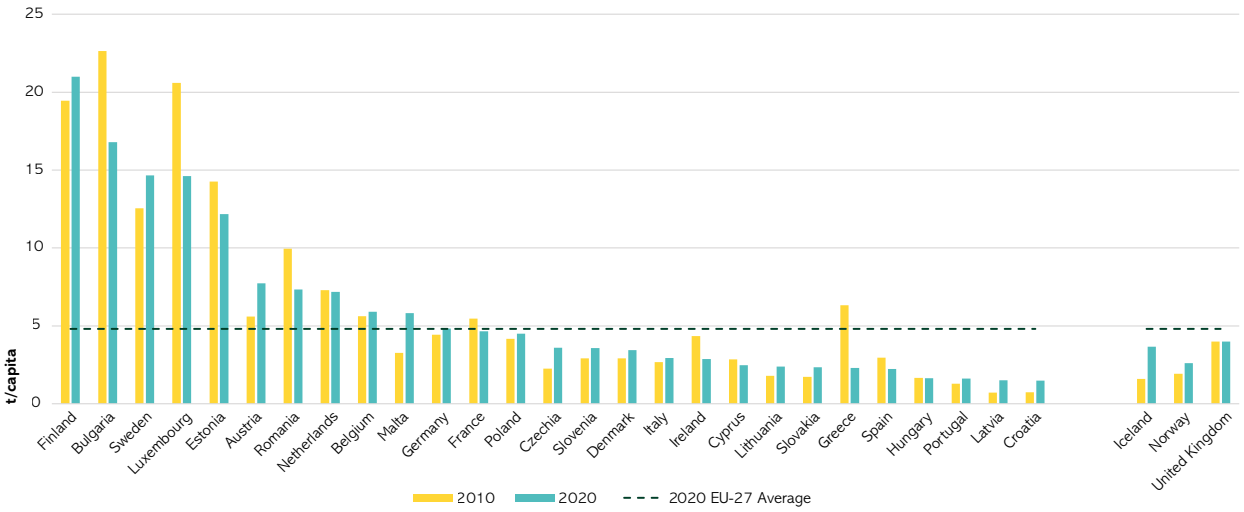
5.5.2. Diversion of waste from landfill

The European Union's waste management strategy is grounded in the waste hierarchy, which emphasises waste prevention first, followed by preparation for reuse, recycling, other forms of recovery, and lastly disposal, including landfilling. The latter is the least preferable option and should only be employed when absolutely necessary. Landfilling can negatively impact the environment, and despite protective measures like bottom sealing, it can still degrade groundwater and surface water quality. The EU's long-term objective is to establish a circular economy that minimises waste generation and utilises unavoidable waste as a resource whenever feasible.

The general landfill rate, which is the proportion of waste sent to landfills relative to waste generated, fell from 23% to 16% between 2010 and 2020. The primary waste categories sent to landfills include household and related waste (mixed municipal waste, waste from markets, bulky waste, and waste comparable to household waste produced by small businesses, office buildings, and institutions), sorting residues (mostly secondary waste from waste treatment facilities), and combustion waste (waste from flue gas purification and slags and ashes from waste incineration). All other waste categories were classified as other waste, encompassing chemical and medical waste, recyclable waste, equipment waste, animal and vegetal waste, mixed and undifferentiated materials, and common sludges.

An important category concerns hazardous waste, which is harmful to humans and the environment. According to the Waste Framework Directive (Directive 2008/98/EC), hazardous waste includes properties such as being explosive, oxidising, flammable, irritant, harmful, toxic, corrosive, and infectious, as well as waste which is capable of causing a hypersensitization reaction or may induce cancer, congenital malformations or hereditary genetic disorders. It also includes waste that may present risks for one or more sectors of the environment. The exports of hazardous waste from EU countries registered a substantial increase, from 6.1 million tonnes in 2010 to 8.2 million tonnes in 2020 (Figure 12). Between 2016 and 2017, the exports were marked by a sharp increase of 1.3 million tonnes (+22%). In 2020, the three EU countries with the highest quantities of exported hazardous waste were France (2.1 million tonnes), Italy and the Netherlands (1.1 million tonnes each).

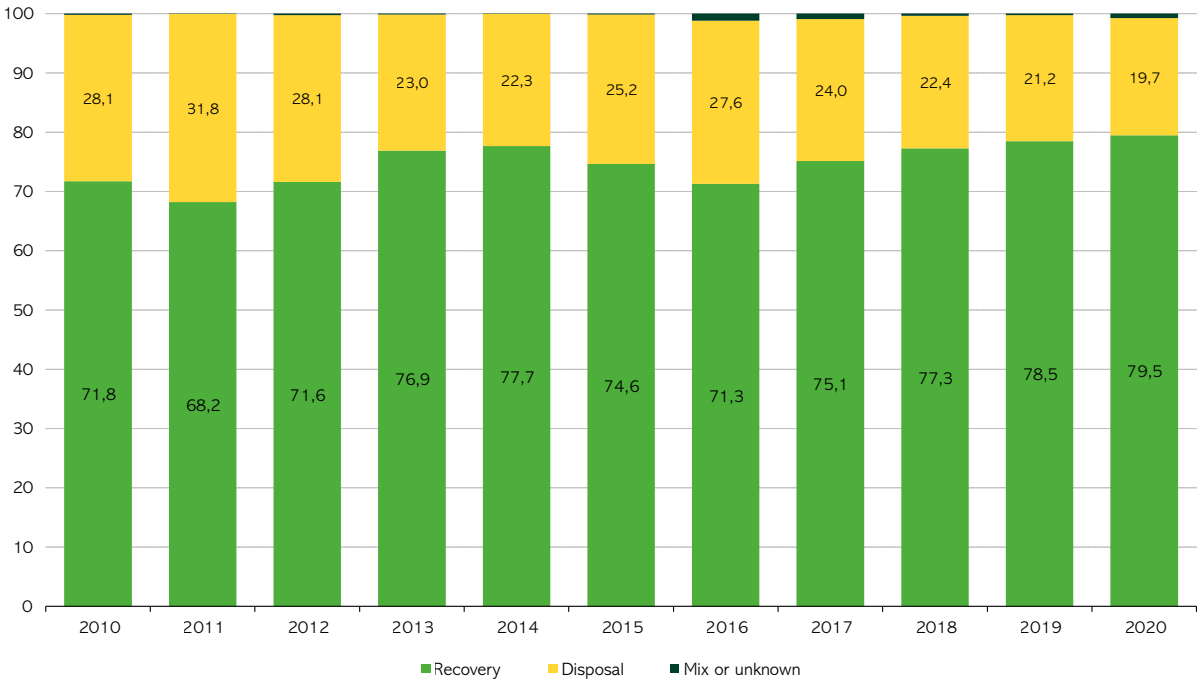
Figure 12: Destinations of hazardous waste exported by EU countries in thousand tonnes



Source: Eurostat

Some improvements can be observed in terms of recovery (recycling/reclamation and usage as fuel, other than direct incineration) and subsequent disposal rates of hazardous waste exported by EU countries to other EU countries and to countries outside the EU (Figure 13). However, the disposal rates of hazardous waste remain rather high.

Figure 13: Treatment of hazardous waste exported by EU Member States (%)

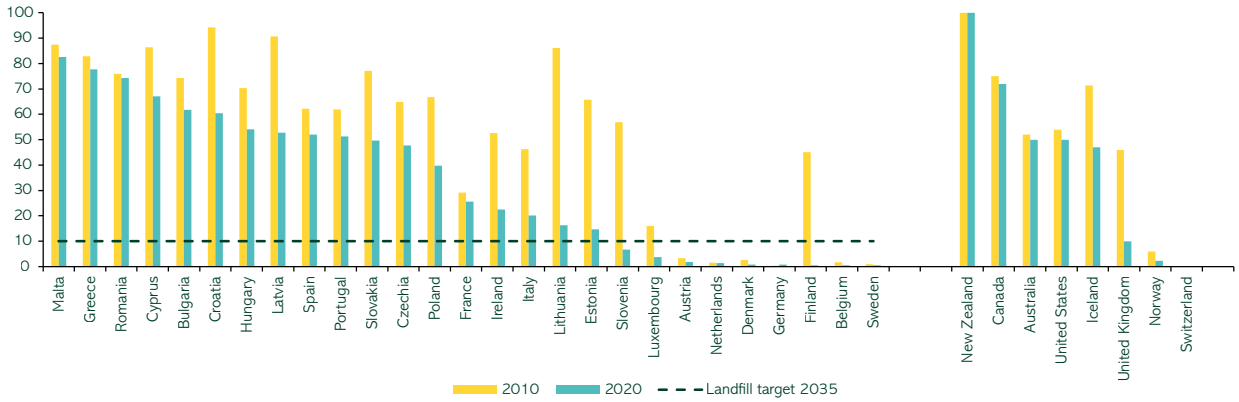


Source: Eurostat

Between 2010 and 2020, the landfilling of household and related waste declined by 57% (40.9 million tonnes), combustion waste by 30% (14.9 million tonnes), and other waste by 28% (9.3 million tonnes). However, the landfilling of sorting residues doubled to 17.6 million tonnes, indicating an expansion of the waste sorting sector and a shift from landfilling towards material recovery and increased recycling.

The landfill rate is calculated as a percentage of municipal waste treated that is landfilled. Landfill rates for municipal waste, a primary waste stream and the focus of waste policies vary significantly across European countries. From 2010 to 2020, nearly all countries reduced their reliance on landfills, with the most significant reductions achieved by Estonia, Slovenia, and Finland (Figure 14). However, some other EU and non-EU countries made minimal progress. Considering the latest data available, in 2020 several EU countries (Bulgaria, Cyprus, Greece, Malta, and Romania) recorded landfill rates of 50% or higher; similar rates were recorded in 2018 by Australia (50%) and the United States (50%), while Canada landfilled 72% of the municipal waste. Successful policies for reducing landfilling include landfill bans and taxes, as well as incentives for recycling and recycling infrastructure.

Figure 14: Municipal waste landfill rates (%) by country 2010- 2020

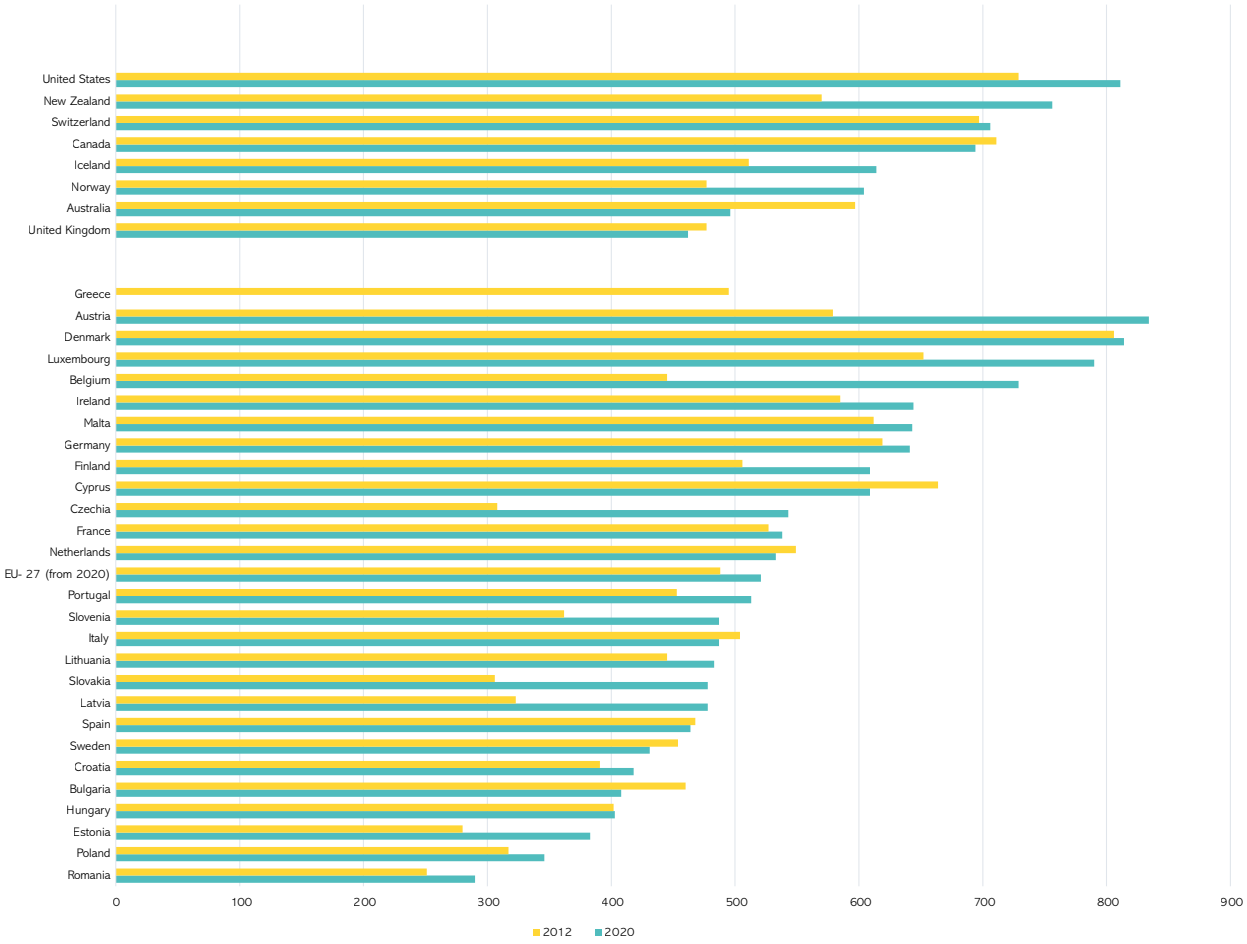


Source: Eurostat and OECD

In accordance with the EU Landfill Directive, Member States must decrease the volume of municipal waste sent to landfills to 10% or less of the total amount of municipal waste generated by 2035. In 2020, nine Member States and two non-EU countries reached this level (Austria, Belgium, Denmark, Finland, Germany, Luxembourg, Netherlands, Norway, Slovenia, Sweden, and Switzerland), with several of these countries incinerating a significant portion of municipal waste. From the above-mentioned countries, Sweden, Belgium, Germany, Denmark, Switzerland, the Netherlands and Austria had the best performance of maintaining low municipal landfill rates throughout the interval 2010-2020, with Sweden (0.1% of GDP), Austria (0.1% of GDP), Switzerland (0.1% of GDP) and Germany (0.2% of GDP) notably recording the lowest government expenditure on waste management compared to the EU 27 average of 0.4% of GDP[3]. The Netherlands had a relatively high government expenditure of 0.6% of GDP on waste management. While the Dutch municipal waste generation per capita (557 kg) is above the European average (489 kg), the Netherlands has one of the lowest landfilling rates (1%) in the EU and a considerable waste incineration capacity. The incineration capacity was the reason for additional waste imports. After registering a peak in 2016, waste imports have declined over the past years. The trend is expected to continue due to the tax on the combustion of waste, which as of 2020 also includes imported waste streams (PBL, 2022).

[3] *See section 2.1 Environmental protection expenditure*

Figure 15: Municipal waste generated in kilograms per capita by country



Source: Eurostat and OECD.
Note: Figures for Canada, New Zealand and the United States are based on OECD data available for 2018; for Australia OECD data available for 2019.

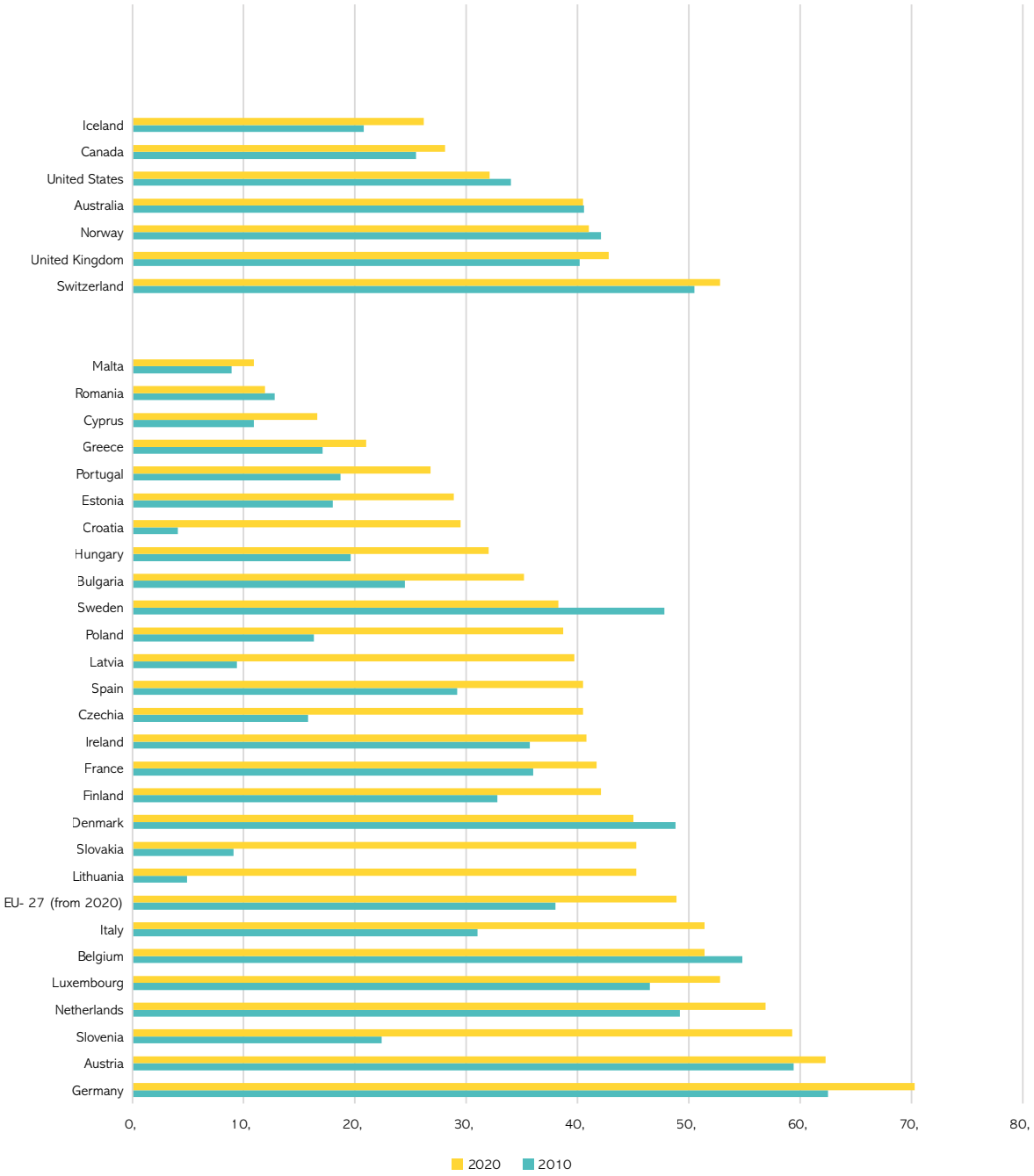
The countries that had the best performance in reducing municipal waste landfill rates throughout the interval 2010-2020 included Lithuania (70%), Estonia (51%), Slovenia (50%), Finland (44%), Ireland (30%), Italy (26%) and Luxemburg (12%). Luxemburg (0.2% of GDP), Lithuania (0.2% of GDP) and Estonia (0.3% of GDP) registered the lowest government expenditure on waste management compared to the EU 27 average. According to the European Environment Agency (EEA), the waste generation (excluding major mineral wastes) in Estonia increased by 12% between 2010 and 2018, while the GDP recorded a steady growth of 38%, which indicates that Estonia made good progress in decoupling waste generation from economic growth since 2010 (EEA, 2023).

5.5.3. Waste recycling

The growing demand for primary resources challenges sustainability ambitions toward material self-sufficiency. Recycling serves as a means to diminish primary resource consumption by substituting them with secondary materials from recycled waste, thus mitigating environmental and climate issues linked to primary resource extraction. Increasing recycling rates is desirable for achieving sustainability, material self-sufficiency, and other advantages of a circular economy. EU waste management objectives play an important role in increasing recycling rates. For instance, the Waste Electrical and Electronic Equipment (WEEE) Directive establishes separate collection and recycling targets for electrical and electronic waste; the Waste Framework Directive sets goals for recycling and preparing municipal waste for reuse; and the Packaging and Packaging Waste Directive outlines recycling objectives for packaging waste. In total, EU waste legislation features over 30 binding targets for the 2015-2030 period.

The waste recycling rates are on the rise in the EU-27 based on the EU-binding recycling objectives. This suggests progress towards using waste as a resource and realising a circular economy. However, to accomplish a circular economy and enhance the environmental performance of waste management, a faster rate of progress is necessary, as most waste ends up in disposal operations such as incineration and landfills. Recycling rates for municipal waste, packaging waste, and waste electrical and electronic equipment (WEEE)—which represent substantial sources of secondary materials and critical raw materials are gradually increasing in Europe, signifying a shift towards utilising waste as a resource and promoting a more circular economy.

Figure 16: Municipal waste recycling rates (%) by country



Source: Eurostat and OECD.
Note: Figures for Canada and the United States are based on OECD data available for 2018; for Australia and Greece OECD data available for 2019.

The overall recycling rate, the proportion between the total waste generated excluding major mineral wastes and the amounts managed through recycling, remains under half of the total waste generation for the period with available data, registering a 46% rate in 2020. The progress made for three key waste streams—packaging, municipal waste, and electrical and electronic waste—has been more substantial than overall recycling progress. This highlights the significance of EU policies, as all three waste streams are targeted by EU legal provisions. Nonetheless, their recycling rates still fall below half of the generated waste, except for packaging, which reached 64% in 2020.

The recycling rate is calculated as a percentage of municipal waste that is recycled, composted, used in anaerobic digestion, and prepared for reuse. Most of the analysed countries have increased their municipal waste recycling rates since 2010, clearly indicating enhancements in waste management (Figure 16). However, the discrepancy in municipal waste recycling performance between countries with the highest and lowest recycling rates is substantial. In 2020, recycling rates varied from 70% in Germany to 11% in Malta for EU Member States. In other European countries, the recycling rates range from 53% in Switzerland to 26% in Iceland. Among the non-European countries, Australia recorded the highest recycling rate of 40% in 2019, followed by the United States with 32% in 2018, and Canada and New Zealand with 28% in 2018. Eight European countries - Germany (70%), Austria (62.3%), Slovenia (59.3%), the Netherlands (56.9%), Switzerland (52.8%), Luxembourg (52.8%), Belgium (51.4%), and Italy (51.4%) - in descending order, achieved recycling rates of 50% or higher, while another seven countries recycled less than 20% of municipal waste.

The countries that performed best in maintaining higher recycling rates over the interval 2010-2020 included Germany, Austria, the Netherlands, Luxembourg, Belgium and Switzerland. Compared to the EU 27 average government expenditure on waste management of 0.4% of GDP, Austria (0.1% of GDP), Switzerland (0.1% of GDP), Germany (0.2% of GDP) and Luxemburg (0.2% of GDP) had the lowest expenditure despite their overall higher recycling rates. The countries that recorded substantial improvements in recycling rates throughout the interval 2010-2020 included Lithuania, Slovenia, Slovakia, Latvia, Croatia, Czechia and Poland, with most of these countries notably scoring below the EU 27 average government expenditure on waste management. Several other countries with relatively low recycling rates made limited progress over the past 15 years, and in 2018, 14 EU Member States were identified as being at risk of not meeting the 2020 recycling target set in the Waste Framework Directive (recycling 50% of specific materials in household and similar wastes).

5.6. ENERGY

The entire world is currently grappling with an energy crisis of unparalleled magnitude and intricacy, with Europe finding itself at the epicentre. This crisis is reverberating across markets, policies, and economies on a global scale. While there has been a surge in the adoption of renewable and clean energy in Europe, the continent's energy matrix still heavily leans on fossil fuels. The combustion of these fuels not only emits harmful air pollutants affecting our well-being but also releases greenhouse gases which exacerbate climate change. Inevitably, the impact of these consequences disproportionately affects the underprivileged and most vulnerable communities.

European countries have a longstanding dependence on energy imports, with statistics showing that in 2020 nearly 60% of the energy consumed in the EU was sourced from abroad, hence prompting a re-evaluation of energy strategies and priorities. These developments call into question the long-term viability of fossil fuel infrastructure and related investment choices. Currently, there is a critical shift taking place in the global energy production and trade landscape, underscoring the need to accelerate the transition towards renewable energy sources that are both sustainable and economically viable.

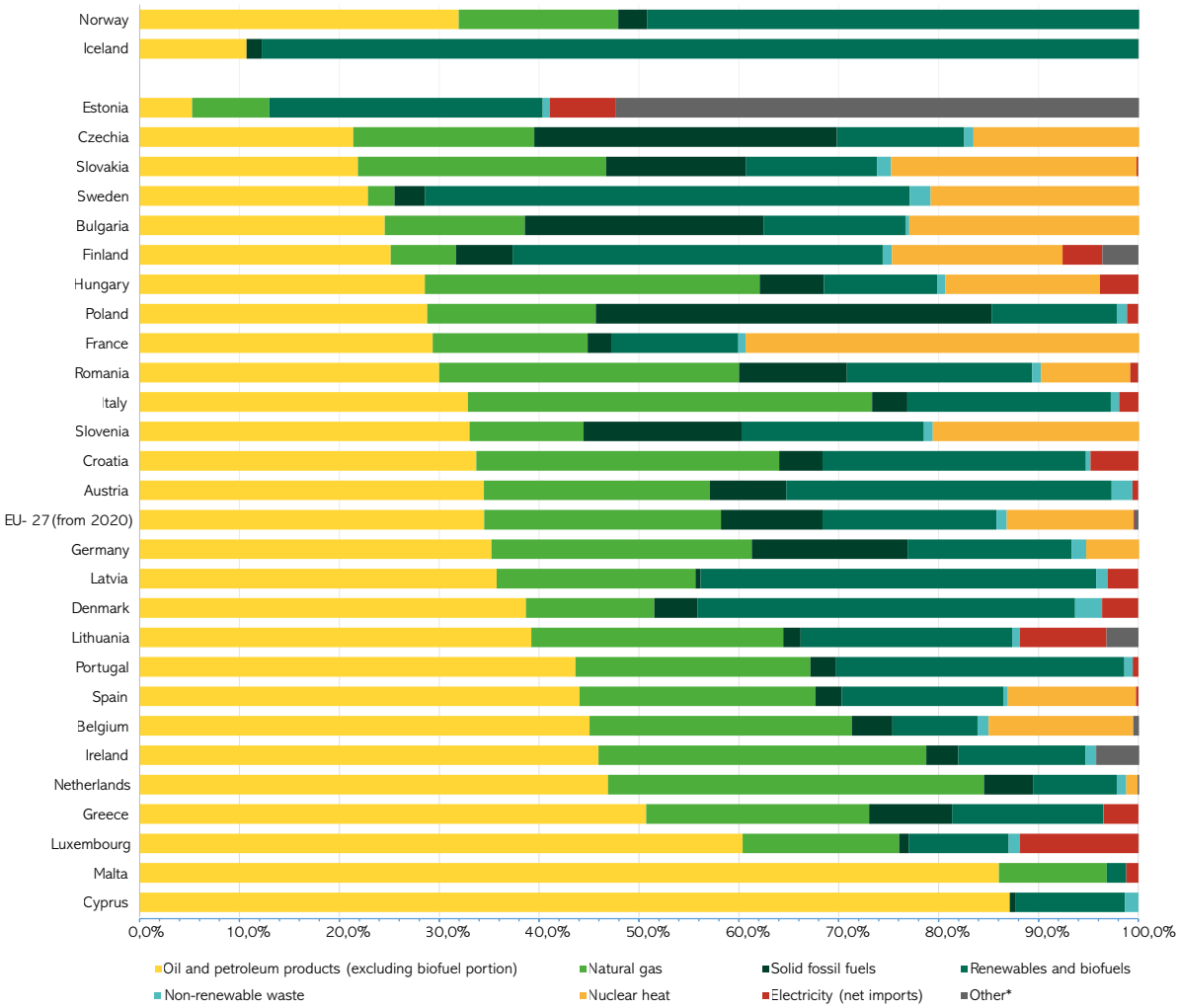
In 2020, over a quarter of the EU's greenhouse gas (GHG) emissions, inclusive of international aviation, were attributed to energy supply. In an attempt to curb emissions, the EU has over the past few decades established ambitious climate and energy goals that target the broad adoption of renewable energy sources, as well as energy efficiency across sectors. The realisation of these goals largely depends on the interplay of factors like technological innovation, behavioural change, trade and investment to drive a secure transition towards a net zero emissions energy system, while minimising the potential risks and trade-offs between various policy objectives.

5.6.1. Energy production and imports

The energy supply within the European Union (EU) consists of both domestically produced energy and energy imported from third countries. Therefore, to gain a comprehensive understanding of the EU's total energy resources, it is important to consider both energy production and imports. In 2021, approximately 44% of the EU's energy was produced within its borders, while the remaining 56% was imported. By contrast, Australia, Canada and the United States maintained their position as net total energy exporters in 2021. Among the various energy sources in the EU, petroleum products hold the largest share of the energy mix. While the current energy crisis bears some similarities to the oil price shocks experienced in the 1970s, there are notable differences. The crisis in the 1970s primarily impacted oil markets, and the global economy was much more reliant on oil at that time compared to today. However, the use of other fossil fuels, particularly natural gas, has not declined to the same extent and, in some cases, has even increased. The present crisis exhibits a global nature, affecting all fossil fuels, and has knock-on effects on electricity prices, signalling broader economic implications (IEA, 2022).

In 2021, the EU's energy mix encompassed five primary sources: crude oil and petroleum products (34%), natural gas (23%), renewable energy (17%), nuclear energy (13%), and solid fossil fuels (12%). In Australia, the energy mix consisted in 2021 of oil as primary energy source (36%), coal (29%), natural gas (27%) and renewables (8%). In 2020, the largest energy source in Canada was natural gas (38%), followed by oil (32%), renewable energy (17%), nuclear energy (9%) and coal (4%). In 2021, New Zealand relied on oil (44%), renewable energy (30%), natural gas (18%) and coal (8%). In 2021, in the United States, oil topped the energy mix (36%), followed by natural gas (32%), renewable energy (12%), coal (11%) and nuclear energy (8%).

Figure 17: Energy mix by source (%) per country



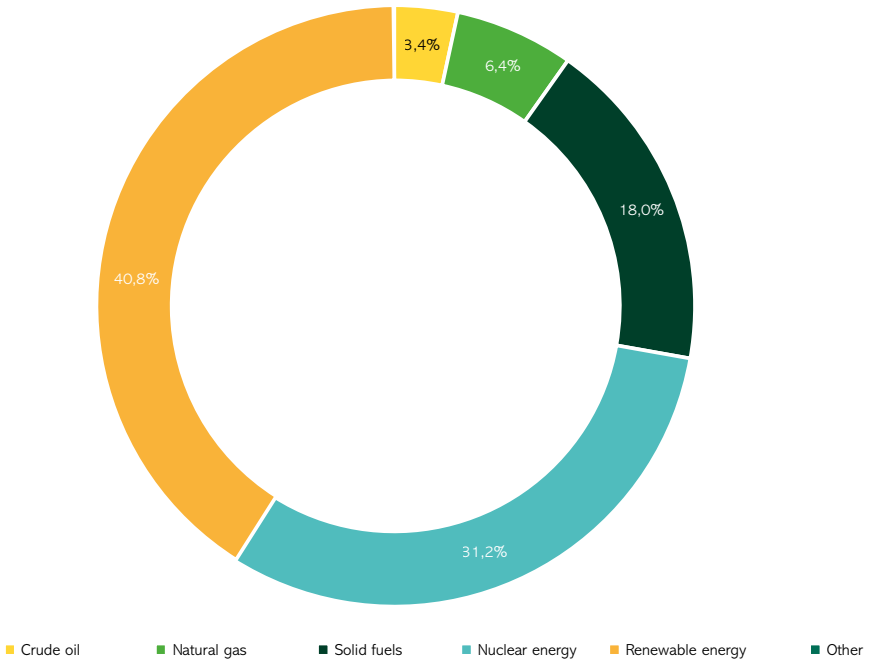
Source: Eurostat

Gross available energy means the overall supply of energy for all activities on the territory of the country.
The distribution of these energy sources varies significantly among countries (Figure 17). In 2021, from the EU countries, Cyprus (86%), Malta (85%), and Luxembourg (61%) had the highest reliance on petroleum products as a share of their available energy. Italy (40%), the Netherlands (35%), and Hungary (34%) relied significantly on natural gas. Sweden (48%), Denmark (41%), Finland (40%), and Latvia (40%) had the largest share of renewable energy sources. France (41%) and Sweden (25%) had substantial contributions from nuclear energy. Estonia (56%), Poland (43%), and Czechia (31%) had the highest proportion of solid fossil fuels in their energy mix. Among the non-EU countries, Iceland (89%) and Norway (51%) recorded the largest share of renewable energy sources.
In the United Kingdom, the largest energy source in 2021 was natural gas (43%), while Switzerland had the highest reliance on oil (43%).

5.6.1.1 Energy production

The European Union (EU) utilises a diverse range of energy sources for its production (Figure 18). These sources include solid fuels, natural gas, crude oil, nuclear energy, and renewable energy (such as hydro, wind, and solar energy). Renewable energies hold the highest proportion of energy production. In 2021, renewable energy accounted for the largest share (41%) of total energy production in the EU. It emerged as the primary contributing source to the EU's overall energy production. Nuclear energy (31%) stood as the second-largest source, followed by solid fuels (18%), natural gas (6%), and crude oil (3%).

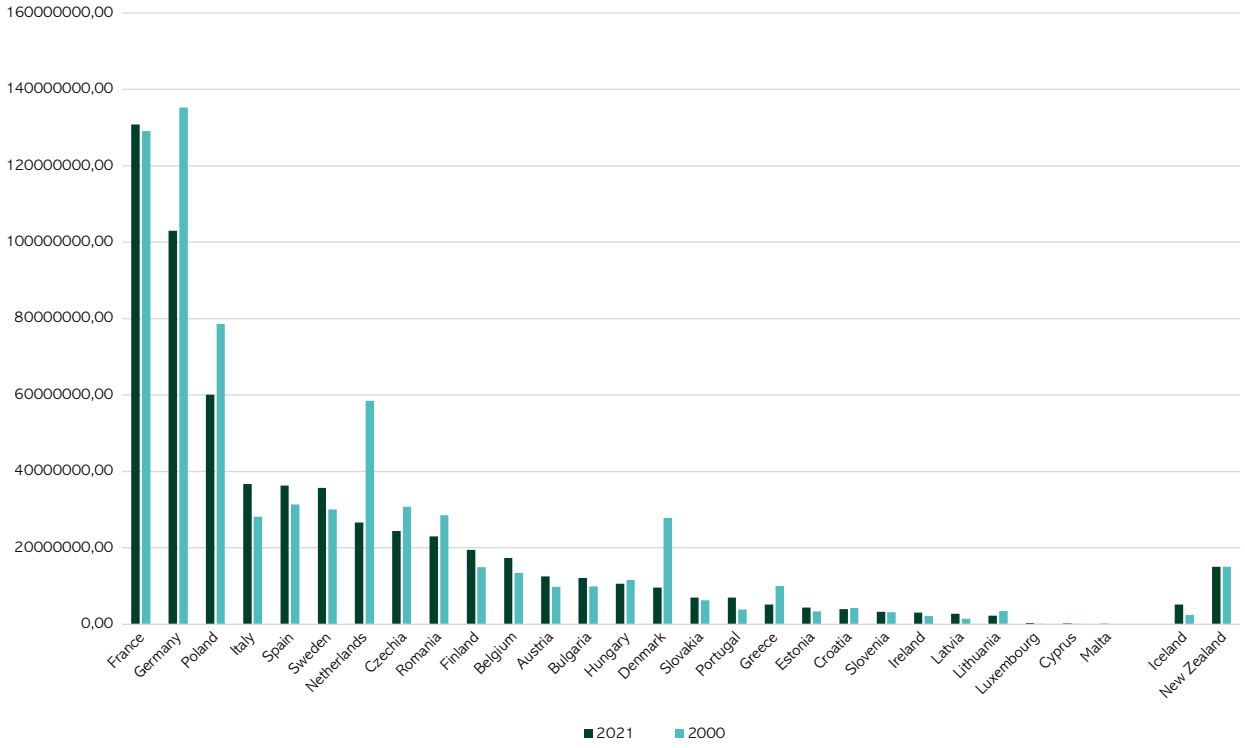
Figure 18: Share of primary production by energy source EU-27 (in %), 2021



Source: Eurostat

In Australia, coal accounted for 63% of energy production in 2021, natural gas for 30%, oil and petroleum products for 4.5%, and renewables for 2.5%. In 2020, Canada's energy production consisted of oil (51%), natural gas (30%), renewable energy (9%), nuclear energy (5%) and coal (5%). In 2021, New Zealand had as its main source renewable energy (41%), followed by oil (32%), natural gas (20%) and coal (7%). In the United States, the main source of primary energy production in 2021 was natural gas (36%), followed by crude oil and petroleum products (31%), renewable energy (13%), coal (12%) and nuclear energy (8%).

Figure 19: Primary energy production in thousand tonnes of oil equivalent by country for 2000 and 2021



Source: Eurostat and Enerdata.
Note: Figures for the United Kingdom, Norway, Australia, Canada and the United States are not shown to avoid distorting the graph.

The production of energy varies significantly across both EU and non-EU countries (Figure 19). In 2021, renewable energy served as the exclusive primary energy source in Malta, implying that no other forms of energy were produced in the country. Moreover, renewable energy claimed a dominant position in several EU countries, with the highest shares in Latvia, and Portugal. Latvia recorded one of the highest shares of renewable energy in the EU (42.1% in 2021), with hydropower accounting for 90% of all renewable installed electricity capacity in the country (EC, 2023). Portugal also has a substantial share of renewable energy, which covered 30.6% of gross final energy demand in 2019, with hydropower and wind sources contributing to 54% of electricity generation (IEA, 2021).

From the non-EU countries, Iceland produces its energy entirely from renewable sources, with hydropower and geothermal energy as the main sources of electricity generation. Norway's electricity system is almost entirely renewables-based, with hydropower representing the dominant source 92% (IEA, 2022). Nuclear energy played a notably significant role in France (76% of total national energy production), Belgium (70%), and Slovakia (60%). Solid fuels constituted the primary energy source in Poland (72%), Estonia (56%), and Czechia (45%). Natural gas held the largest share in Norway (47%) and Ireland (42%), while crude oil dominated in Denmark (35%) and the United Kingdom (42%). The Netherlands substantially relied on natural gas (42%) and oil (37%) within the total energy supply, with other sources including coal (11%), biofuels and waste (5%), and small shares from nuclear, wind, solar, hydropower and geothermal (IEA, 2020). The energy generated from renewable sources had a share of only 7.4% of total final energy consumption in 2018, yet it registered an increase over the past years to 13% in 2021.

5.6.1.2 Energy imports and dependency

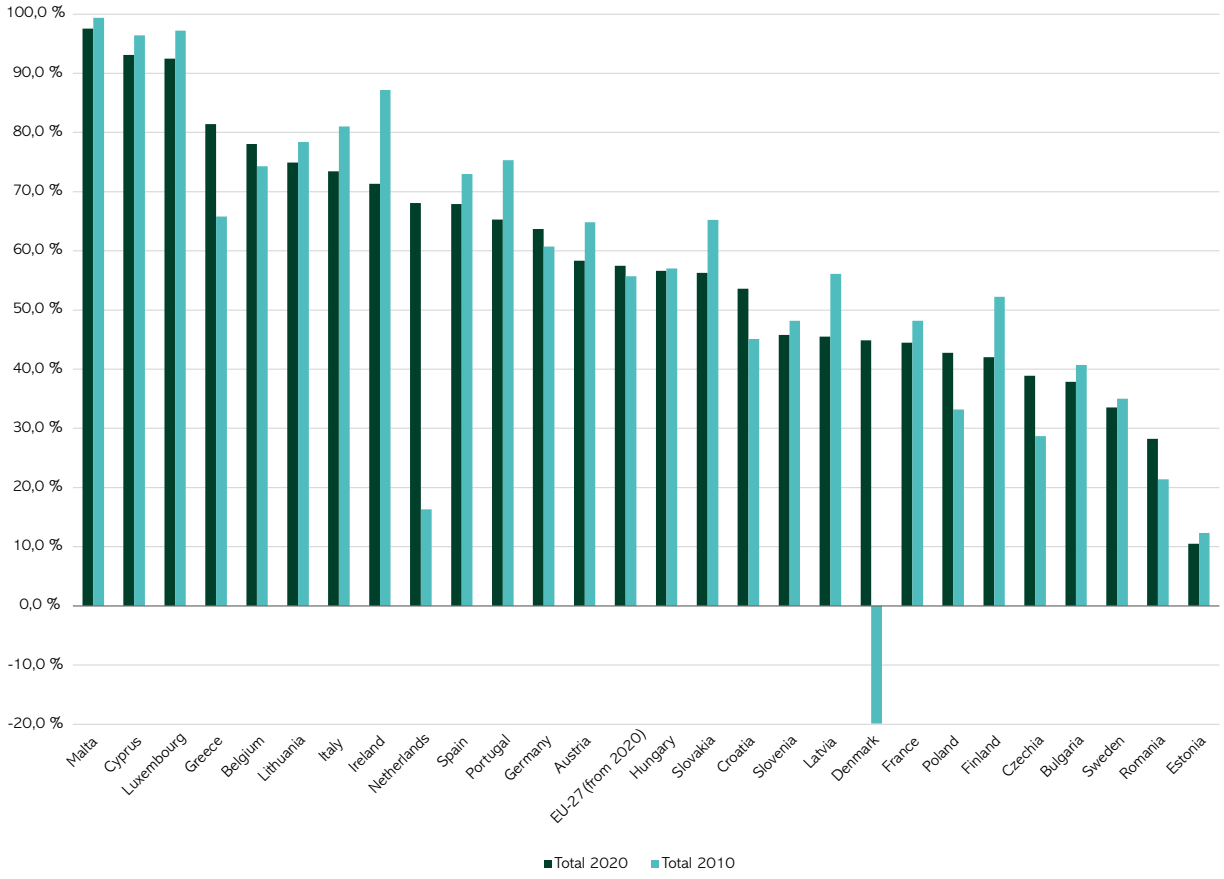
The European Union (EU) relies on imported energy from third countries to meet its own consumption needs. In 2021, petroleum products, including crude oil as the primary component, constituted the largest portion of energy imports into the EU, accounting for nearly two-thirds (64%) of total energy imports. Natural gas followed with a share of 25%, while solid fossil fuels accounted for 6% of imports.

Analysing the extra-EU crude oil imports in 2021, more than half originated from five key sources: Russia (28%), the United States and Norway (9% each), Libya and Kazakhstan (6% each). Similarly, almost three-quarters of

the EU's natural gas imports came from Russia (44%), Norway (16%), and Algeria (12%), while over half of the solid fossil fuel imports, predominantly coal, came from Russia (52%), with Australia (17%) and the United States (15%) being other significant sources[4].

Import dependency concerns the share of net imports in the gross available energy, or how much a country depends on imports from abroad. In 2021, Cyprus and Malta had a particularly high dependency on petroleum product imports, with over 85% of their energy imports consisting of such products. Italy, Hungary and the United Kingdom relied significantly on natural gas imports, with a third or more of their energy imports being attributed to natural gas. Slovakia (17%) and Czechia (15%) had the highest shares of solid fuel imports among the Member States.

Figure 20: Energy dependency rates EU-27 (in %)



Source: Eurostat

In 2021, the EU's import dependency rate stood at 56%, indicating that more than half of the EU's energy needs were covered through net imports. However, the dependency rate varied among Member States, ranging from 90% or higher in Malta, Luxembourg, and Cyprus to around 1% in Estonia (Figure 20). In Estonia, the energy supply substantially relied on domestic oil shale used for heat and power generation, as well as for producing liquid fuels. This explains the country's low energy dependency rate. In 2018, oil shale represented 72% of Estonia's total domestic energy production (IEA, 2019). Romania is the second largest gas producer in the EU after the Netherlands (EC, 2023) and has a diverse energy mix that consists of oil (36%), gas (30%), coal (14%) nuclear power (8%), and renewable energy (12%). Among the non-EU countries, Australia, Canada, Norway and the United States were net total energy exporters in 2021.

[4] *The overview of energy imports is subject to constant change due to EU sanctions imposed on Russia.*

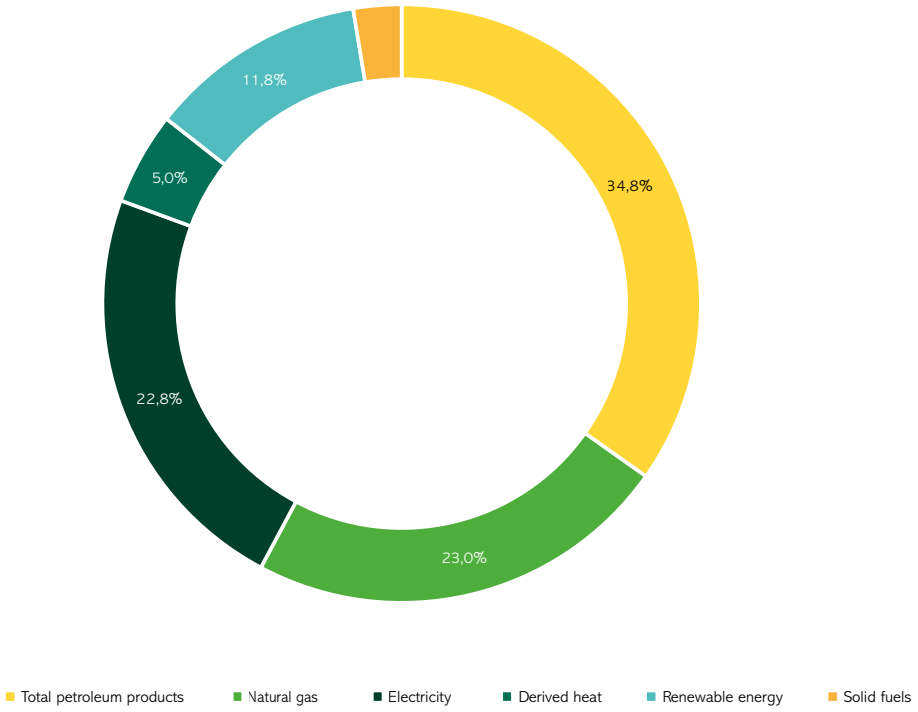
5.6.2. Energy consumption

Approximately two-thirds of the total energy available in the European Union (EU) is consumed by end users, including EU citizens, industries, and transportation, among others. The remaining one-third is primarily lost during electricity generation and distribution, used to support energy production processes, or utilised for non-energy purposes, such as asphalt or bitumen.

In 2021, the most consumed energy source in the EU for final energy consumption was petroleum products (such as heating oil, petrol, and diesel fuel), accounting for 35% of the total (Figure 21). Electricity and natural gas (including manufactured gas) ranked second, each contributing 23% to final energy consumption.

The direct use of renewables (not transformed into electricity) for space heating or hot water production, such as wood, solar thermal, geothermal, or biogas, accounted for 12% of consumption. Derived heat, such as district heating, made up 5%, and solid fossil fuels (primarily coal) represented 3%. It is important to note that the actual consumption of renewable energy is higher than 12% since other renewable sources, including hydropower, wind power, and solar photovoltaic, are included in the electricity sector.

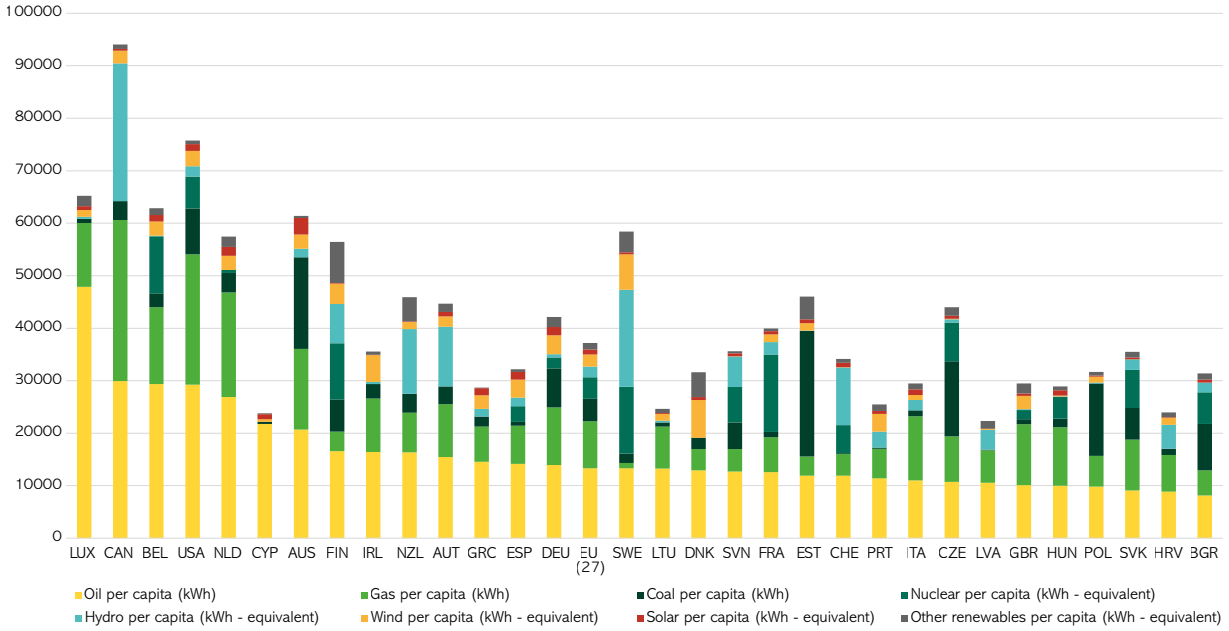
Figure 21: Share of energy products in final energy consumption EU-27 (%), 2021



Source: Eurostat

The final energy consumption patterns vary considerably among both EU and non-EU countries (Figures 22 and 23). In 2021, petroleum products constituted over 55% of final energy consumption in Luxembourg and Cyprus. Electricity accounted for over 30% in Malta and Sweden, while natural gas represented more than 30% in the Netherlands, Hungary, Belgium, and Italy. Renewable energies accounted for over 25% of final energy consumption in Finland, Sweden, and Latvia.

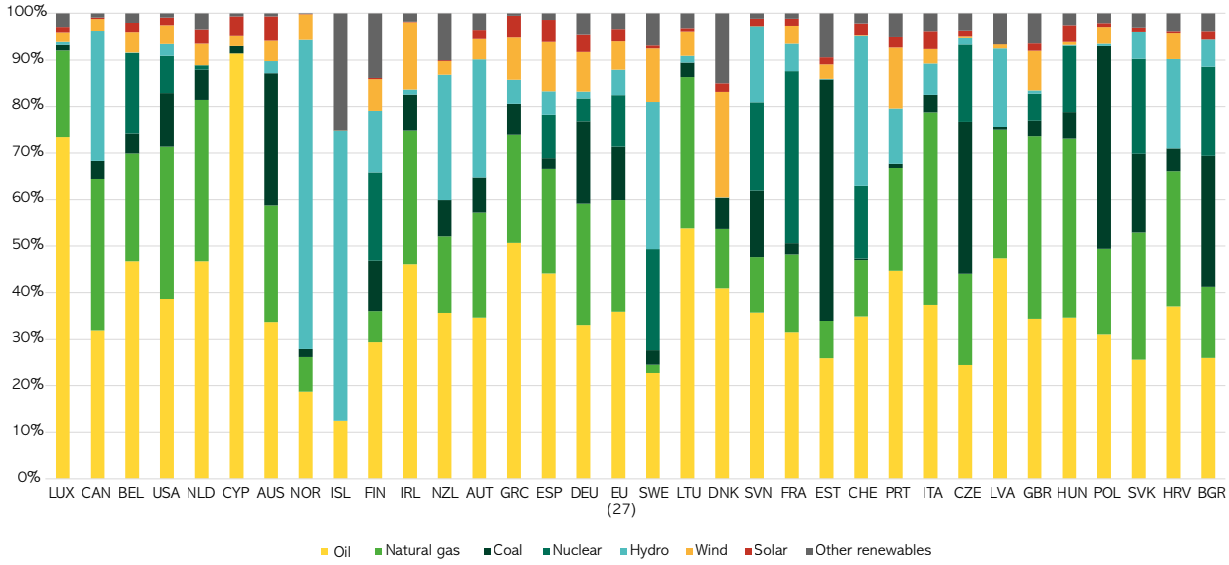
Figure 22: Per capita primary energy consumption in kWh (-equivalent) by source



Source: Energy Institute Statistical Review of World Energy.
Note: Figures for Iceland and Norway are not shown to avoid distorting the graph.

Most non-EU countries included in this study recorded a high reliance on either petroleum products or natural gas as the main energy sources within their final energy consumption in 2021. Oil products represented the most consumed energy source in Australia (52%), New Zealand (44%), Switzerland (43%) and the United States (36%). Natural gas was the most consumed energy source in the United Kingdom (43%) and Canada (38%). By contrast, Iceland and Norway recorded a high reliance on electricity with 53% and respectively 51% of the total final energy consumption.

Figure 23: Share of energy sources in primary energy consumption (%)



Source: Energy Institute Statistical Review of World Energy

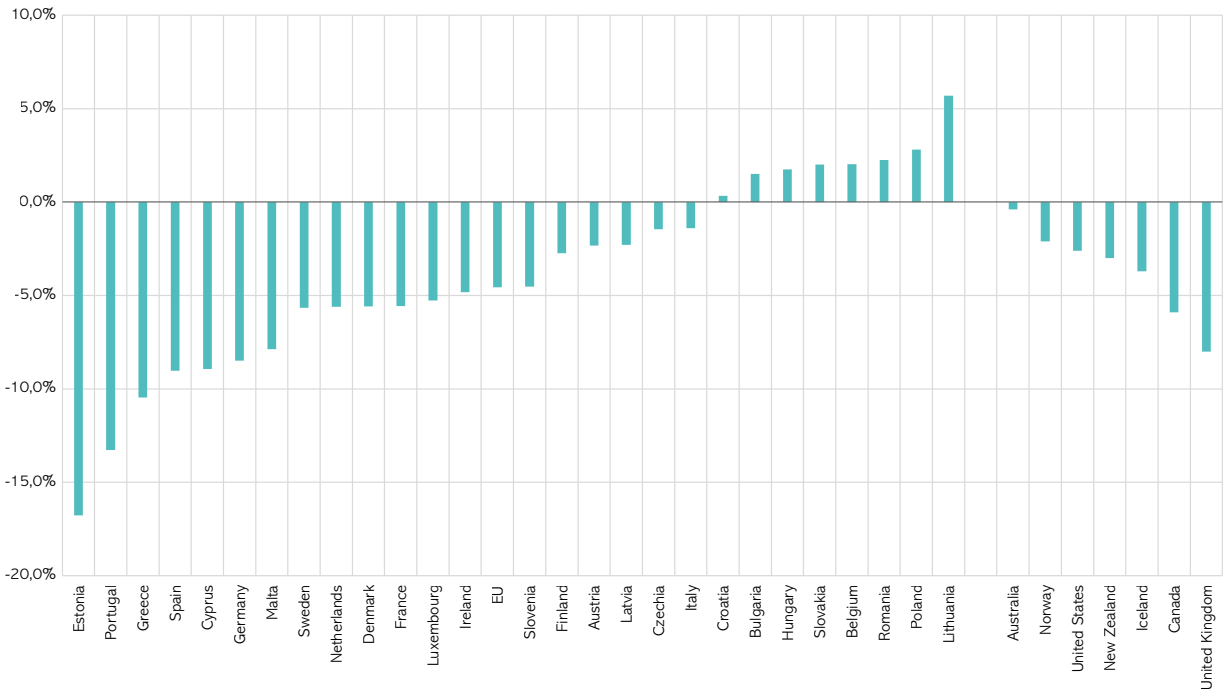
Energy is consumed by different sectors of the economy, including households, transportation, industry, services, agriculture, and forestry. In terms of sector-specific energy consumption within the EU, the transport sector consumed the most energy in 2021, accounting for 29% of final energy consumption. It was followed by households (28%), industry (26%), services (14%), and agriculture and forestry (3%). From the non-EU countries, the transport sector also ranked as the highest consumer of energy in 2021 for Australia (39%), New Zealand (37%), the United States (37%) and the United Kingdom (34%). In Canada, the industry sector consumed the most energy (34%), closely followed by transportation (33%).

5.6.3. Energy efficiency

One of the key priorities of the Energy Union strategy is to enhance energy efficiency by reducing the overall energy consumption in the European Union (EU) and managing energy resources in a more cost-effective manner. Improving energy efficiency not only leads to energy savings but also contributes to environmental protection, climate change mitigation, and reducing the EU's dependence on external oil and gas suppliers.

In practical terms, achieving higher energy efficiency involves reducing both primary energy consumption, which refers to the total domestic energy demand, and final energy consumption, which represents the energy actually consumed by end users. This excludes the energy required by the energy sector itself, as well as losses during transformation and distribution processes.

Figure 24: Primary energy consumption compared with the 2017-2019 average



Source: Eurostat and Enerdata

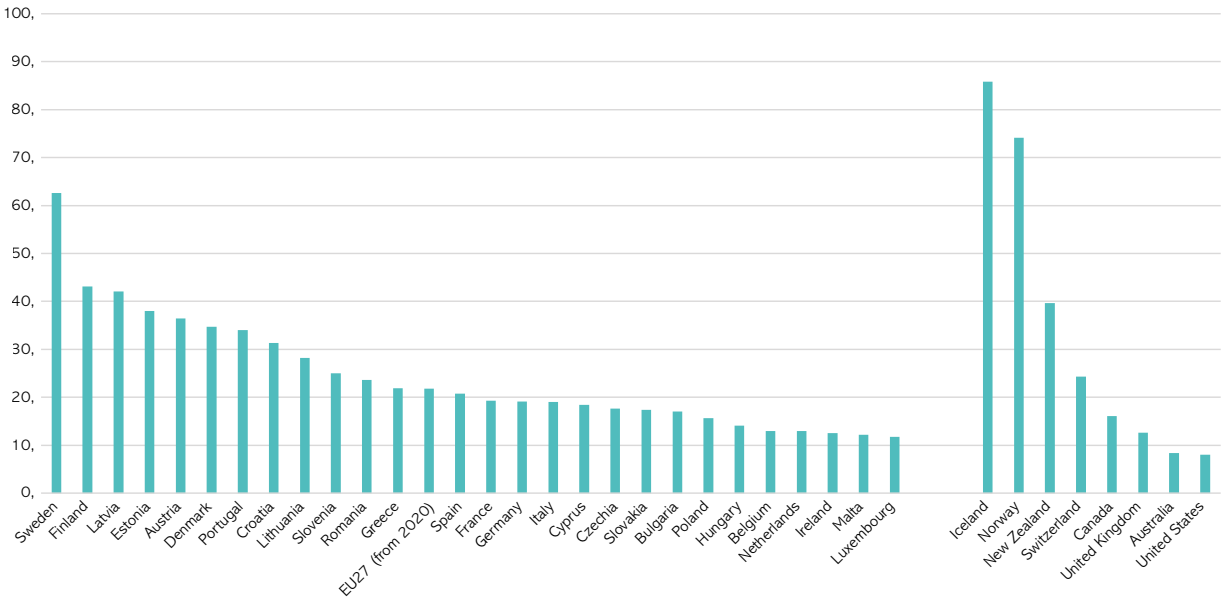
In 2021, primary energy consumption in the EU amounted to 1,309 million tonnes of oil equivalent (Mtoe). This represented a 5.9% increase compared to 2020 when consumption reached its lowest level due to the impact of the pandemic. However, it remained the second-lowest level since 1990 (the earliest year for which data is available). The 2021 level is still 16.1% higher than the EU's 2030 target of not exceeding 1,128 Mtoe for primary energy consumption. Among non-EU countries, the consumption figures reveal a similar trend in 2021. In the United States and the United Kingdom, energy consumption registered an increase of 4.7% from 2020 as the economy recovered from the effects of the COVID-19 pandemic, yet it remained below the 2019 levels, with -2.6% for the US and -8% for the UK. Canada's energy consumption recorded a contraction of 5,9% compared to the 2017-2019 average. In Australia, energy consumption had a slight decrease below 1% and remained relatively stable compared to the pre-pandemic levels. These figures highlight the need for further efforts to improve energy efficiency in order to achieve the energy consumption targets and foster sustainable energy practices.

5.6.4. Share of energy from renewable sources

The gross final renewable energy consumption is the amount of renewable energy consumed for electricity, heating and cooling, and transport in each country, and is expressed as a share of gross final energy consumption. In 2021, the share of renewable energy in overall energy consumption at the EU level slightly decreased to 21.8% compared to 2020, marking the first recorded decline. This decline can be attributed to the easing of restrictions related to the COVID-19 pandemic, which influenced energy consumption patterns. The current target set by the EU is to achieve a renewable energy share of 32% by 2030.

Among EU Member States, Sweden stood out with the highest proportion of renewables in energy consumption, reaching 62.6% in 2021 (Figure 25). Finland followed closely with 43.1%, and Latvia with 42.1%. Finland had a low reliance on fossil fuels due to its nuclear energy capabilities and the high share of renewables, mainly biomass, hydro and wind power in electricity generation (IEA, 2023). Despite a slow uptake of renewable energy sources from wind and solar, Latvia relied substantially on hydropower, which represented 90% of all renewable installed electricity capacity in the country (EC, 2023). Denmark also registered an important share of renewables (34.7%) and is considered a frontrunner in the integration of bioenergy, wind, solar and geothermal energy. Besides having one of the highest shares of installed wind power, Denmark's use of combined heat and power plants with heat storage capacity provides an excellent example of the efficient integration of heat and electricity systems (IEA, 2017).

Figure 25: Share of energy from renewable sources in overall energy consumption (in %)



Source: Eurostat and OECD

The lowest shares of renewables were observed in Luxembourg (11.7%), Malta (12.2%), the Netherlands (12.3%), and Ireland (12.5%). These variations can be attributed to differences in natural resource endowments, particularly in terms of the potential for developing hydropower plants and the availability of biomass. Of the non-EU countries, Iceland (86%) and Norway (74%) reported the highest share of renewables in energy consumption. New Zealand covered roughly a third (39%) of energy consumption from renewable sources, followed by Switzerland (24%), Canada (16%), the United Kingdom (12%), the United States (8%) and Australia (8%).

It is important to note that the share of renewables in energy consumption is influenced by a combination of factors, including policy frameworks, technological advancements, and geographical characteristics. This decade's momentum for the clean energy transition in the developed countries is being driven by newly introduced policy frameworks and government agendas and objectives, particularly those outlined in the Inflation Reduction Act in the United States, the RePowerEU plan and Fit for 55 package in the European Union, and the Climate Change Bill in Australia. Nevertheless, the implementation of these measures is not immediate. This requires significant involvement and behavioural changes from consumers. Efforts to expand the use of renewable energy sources remain crucial for achieving sustainable and low-carbon energy systems throughout the EU and the world more broadly.

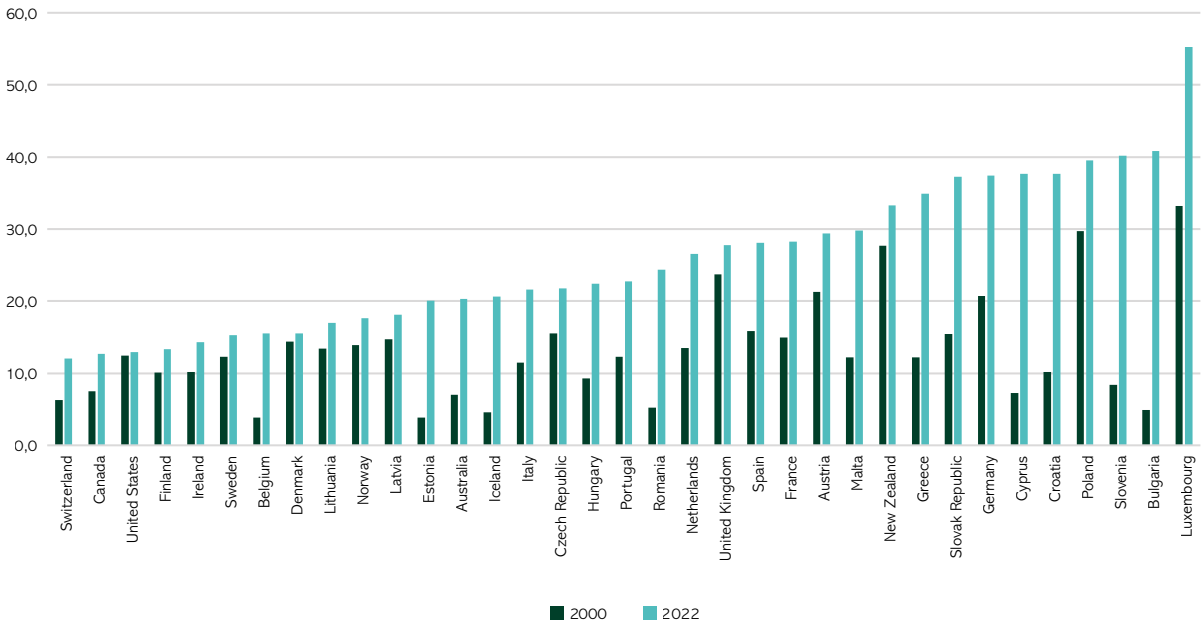
5.7. BIODIVERSITY AND LANDSCAPES

Biodiversity encompasses the number, variety and variability of plants, animals and other organisms, including humans. The European Union is committed to the protection of biodiversity. And has built up a large network of 27,000 protected areas (known as Natura 2000) in all the Member States. This represents 18% of the EU territory on land and 9% of EU seas. Designation of protected areas is an important policy tool for halting biodiversity decline. Economic activities are allowed under Natura 2000 as long as they do not affect the conservation status of species or habitats negatively. In addition, EU Member States have protected large portions of their territory under national protection schemes. In 2021, around 1.1 million km² of the EU Member States' land area was designated for the preservation of biodiversity as Natura 2000 sites or nationally protected sites. This study examines the main indicator for biodiversity — information on protected areas (for terrestrial and marine biodiversity) in the reporting countries.

5.7.1. Terrestrial protected areas

This indicator represents country-level protected area coverage for the terrestrial domains calculated from the World Database on Protected Areas (WDPA). It is measured as the percentage of total land area for terrestrial protected areas. Overall, by the end of 2021, terrestrial protected areas covered 26% of EU land, with 18.6% of this area designated as Natura 2000 sites and 7.4% as other national designations. The EU biodiversity strategy for 2030 sets out a target of protecting at least 30% of EU land by 2030, while also ensuring that all protected areas are effectively managed (Eurostat, 2023). The highest shares of terrestrial protected areas (Figure 26) are reported by Luxembourg (55.3%), Bulgaria (40.9%) and Slovenia (40.1%). In contrast, the lowest shares of protected areas from EU states were observed in Finland (13.3%), Ireland (14.3%) and Sweden (15.3%). Among non-EU countries Canada and the United States report the lowest share of protected areas (12.7% and 13 % respectively). Figure 26 also shows that all the reporting countries have increased the share of terrestrial protected areas between 2000 and 2022 with some showing drastic increases (e.g. Belgium, Hungary, Slovenia, Croatia, Cyprus, Bulgaria and Romania).

Figure 26: Terrestrial protected areas (% of total land area)



Source: OECD

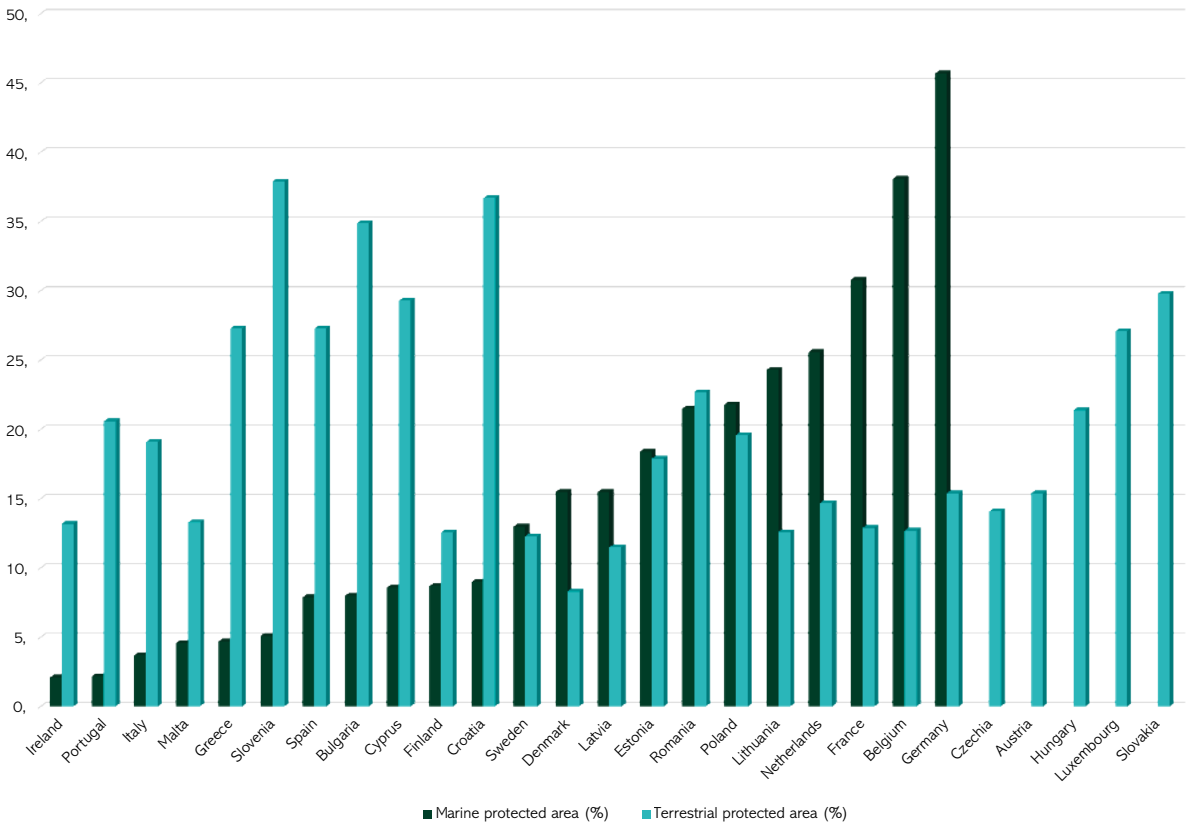
Some Member States protect a large proportion of their land as Natura 2000 (Figure 27). The highest shares of terrestrial protected areas (as Natura 2000) are in Slovenia (38%), Croatia (37%), Bulgaria (35%), Slovakia (30%),

Cyprus (29%), and Spain, Luxembourg and Greece (27% each). At the other end of the spectrum are Denmark (8%), Latvia and Sweden (both 12%), and six other Member States that have designated 13% of their land territory as Natura 2000 sites. It is important to note that, in general, biodiversity in Europe decreases from south to north (or from the Equator to the Pole) which partly explains the geographical pattern of designating protected areas. The largest network of terrestrial Natura 2000 areas in absolute terms is located in Spain with a coverage of 138,083 km^2 in 2020. This is almost twice the size of the next largest national Natura 2000 network in France (71,030 km^2), and it is larger than the country area of the 19 smallest EU Member States (Eurostat, 2023). Furthermore, when correlating population density (persons per square kilometres) with the size of terrestrial protected areas, Malta, the Netherlands and Switzerland have the highest share of terrestrial protected areas in relation to the population density. This largely indicates limited space for human activities in these countries.

5.7.2. Marine protected areas

This indicator represents country-level protected marine area coverage (km^2 and percentage of national marine waters area) under Natura 2000, without area only protected under national legislation. More than 450,000 km^2 of the EU's marine waters were protected as marine Natura 2000 areas in 2020. This represents 8% of EU marine waters. Germany protected the largest share of its marine waters as Natura 2000 (46%), followed by Belgium (38%) and France (36%). The smallest shares of protected marine waters were observed for Ireland (2%), Portugal (2%) and Italy (4%), followed by Greece and Slovenia (5% each) (Figure 27). These shares have been calculated using the area of marine waters reported for the 'Marine Strategy Framework Directive' as total. In absolute terms, the largest national network of marine Natura 2000 areas is located in coastal waters around France (132,688 km^2). Together with the second largest national network in Spain (84,405 km^2) these account for almost half (48%) of the total marine Natura 2000 area of the EU (Eurostat, 2023).

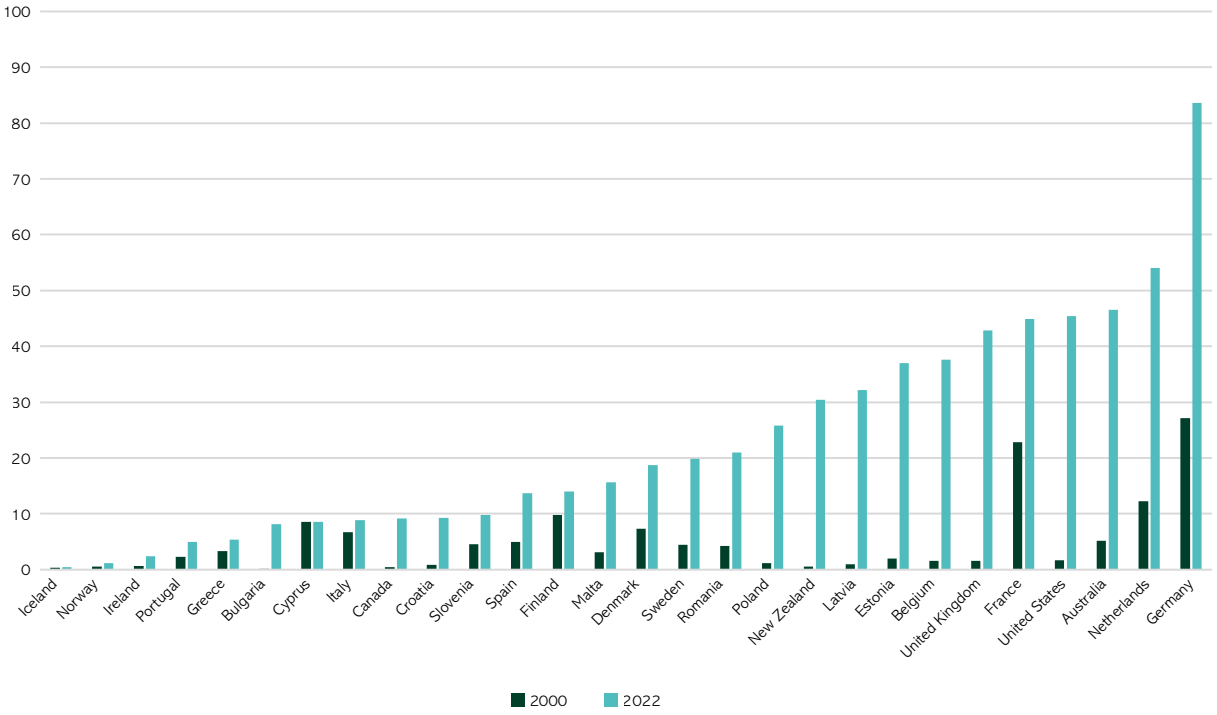
Figure 27: Share of protected land and marine waters (as Natura 2000), 2020



Source: Eurostat
Note: protected terrestrial area as % of marine and national territory, protected marine area as % of national marine water area as reported for the Marine Strategy Framework Directive. Marine protected area not applicable for Czechia, Luxembourg, Hungary, Austria and Slovakia

At the same time, the OECD proposes a different indicator to measure marine protected areas calculated from the World Database on Protected Areas (WDPA). It is measured as the percentage of Exclusive Economic Zones for marine protected areas. The Exclusive Economic Zone (EEZ) of a country extends 200 nautical miles from the coastline, or to the mid-point between coastlines where the EEZ of different countries would otherwise overlap. Figure 28 displays the marine protected areas as % of exclusive economic zones for 2000 and 2020 with Germany and Netherlands reporting the highest share of marine protected areas in 2020.

Figure 28: Marine protected areas (% of Exclusive Economic Zones)



Source: OECD

5.8. CITIZENS' PERCEPTIONS OF CLIMATE CHANGE AND ENVIRONMENTAL POLICY

Citizens' perceptions of climate change are closely tied to trust in governmental institutions and the effectiveness of environmental policies. Governments play a pivotal role in addressing climate change and environmental protection through investments and policies, often extending to future generations. However, securing public support for such intergenerational initiatives is challenging. Public trust is a crucial element, as it is both a determinant and a consequence of citizens' beliefs in the government's willingness and capability to address climate change.

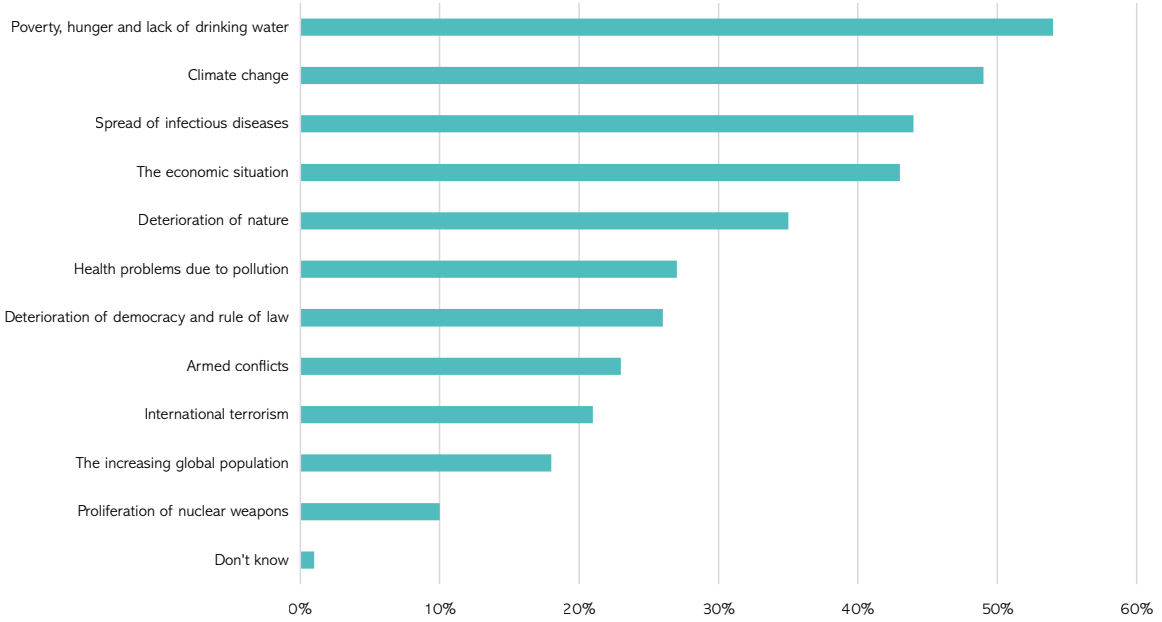
The design and implementation of policies via environmental governance significantly influence the credibility and trustworthiness of public institutions. However, when it comes to climate change, citizens are notably sceptical about the government's ability to make meaningful progress. This scepticism can be partly explained in view of the personal costs associated with climate policies. In general, citizens are often reluctant to make immediate and enduring choices that are necessary to tackle climate change, especially since the potential benefits often entail a long-term horizon.

To address climate change effectively, governmental institutions need to build and sustain public trust through credible commitments and to ensure that policies are perceived as effective. The efforts of balancing the short-term costs with long-term benefits, including the effective communication of these efforts to the public, are critical in ensuring support for environmental policies.

5.8.1. Citizens' perceptions of climate change and environmental protection

In every country included in this study, climate change and the deterioration of nature are perceived as key challenges of this century (Figure 29). According to the latest EIB Climate Survey (EIB, 2022), a significant share of respondents in the European Union, the United Kingdom, and the United States recognise the importance of climate change and its consequences. The sentiment is widespread among Europeans (81%), followed by the British (74%), and Americans (59%). Notably, in the European Union, United Kingdom, and United States, the younger generation displays a higher awareness of the climate crisis by contrast to their senior counterparts[5]. As such, the younger generation in almost all countries has a higher disposition to take action toward climate change.

Figure 29: EU-27 overview: Which of the following do you consider to be the single most serious problem facing the world as a whole? (Max. 4 answers, in % - EU27)



Source: Eurostat

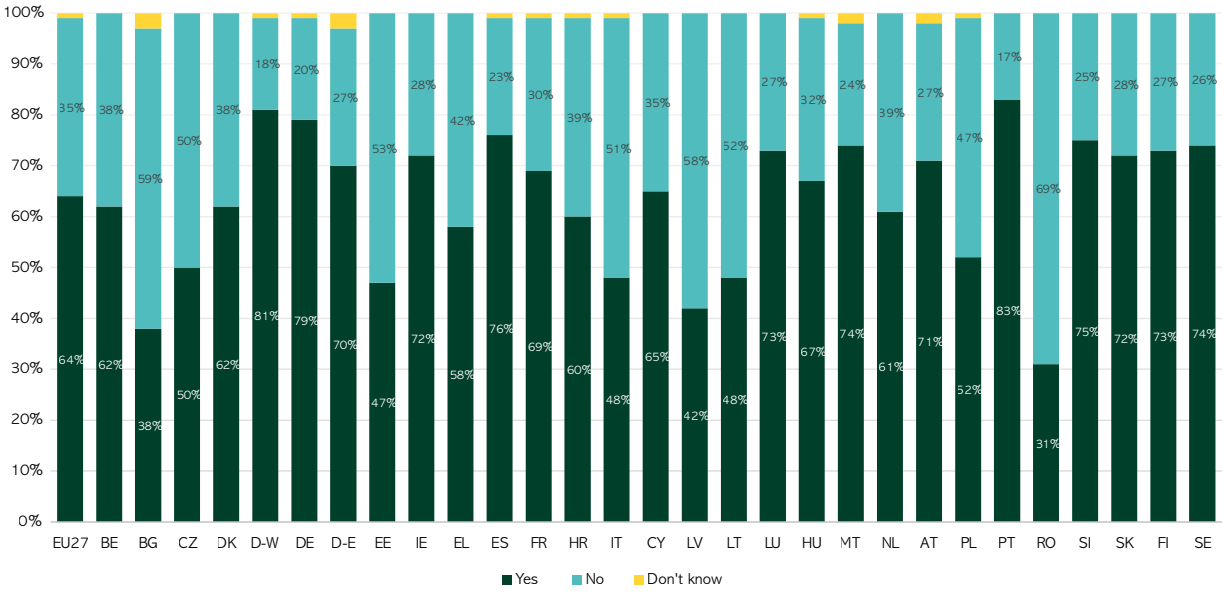
Delving into the specific actions undertaken to combat climate change, the European Commission's survey on Climate Change (EC, 2021) shows that an overwhelming majority of EU citizens (96%) undertook at least one action to combat climate change. Subsequently, roughly 75% of respondents made efforts to limit waste and separate it for recycling, whereas nearly 60% tried to reduce the use of disposable items. In 2021, the national overview indicates that over half of respondents in 20 EU countries personally took action to fight climate change over the past six months (Figure 30). Over 75% of respondents took action to fight climate change in Portugal (83%), Germany (79%) and Spain (76%). Around half of respondents in Poland (52%), Czech Republic (50%), Italy (48%), Lithuania (48%), and Estonia (47%) reported actions to fight climate change; smaller shares of respondents indicated such actions in Latvia (42%), Bulgaria (38%) and Romania (31%). However, it is important to note that since 2019, there has been a decline in some of these pro-environmental behaviours, such as the regular adoption of eco-friendly alternatives to personal vehicles, which registered a 7% decrease; this could potentially be attributed to the COVID-19 pandemic.

The majority of EU respondents perceive the actions to tackle climate change as a dual opportunity for the EU citizens and the economy. An astounding 90% concur that prioritising climate change mitigation could significantly contribute to public health. Additionally, over 60% of respondents believe that such a priority would lead to beneficial outcomes for EU citizens. Economically, there is a strong consensus (78%) that the EU's expertise in clean technologies could foster job creation and that climate action could enable EU companies to innovate and become more competitive. Roughly 70% of respondents believe that curbing fossil fuel imports could enhance the EU's energy security and prove beneficial to the European economy.

[5] *Trends confirmed by EIB Climate Survey (2022) and OECD report Building Trust to Reinforce Democracy (2021)*

There is also widespread agreement among respondents that public funding should be channelled towards a green transition, and that the costs of climate change impacts far outweigh the investments required for such a transition.

Figure 30: Breakdown per country EU-27, 2021: Have you personally taken any action to fight climate change over the past six months?



Source: Eurostat

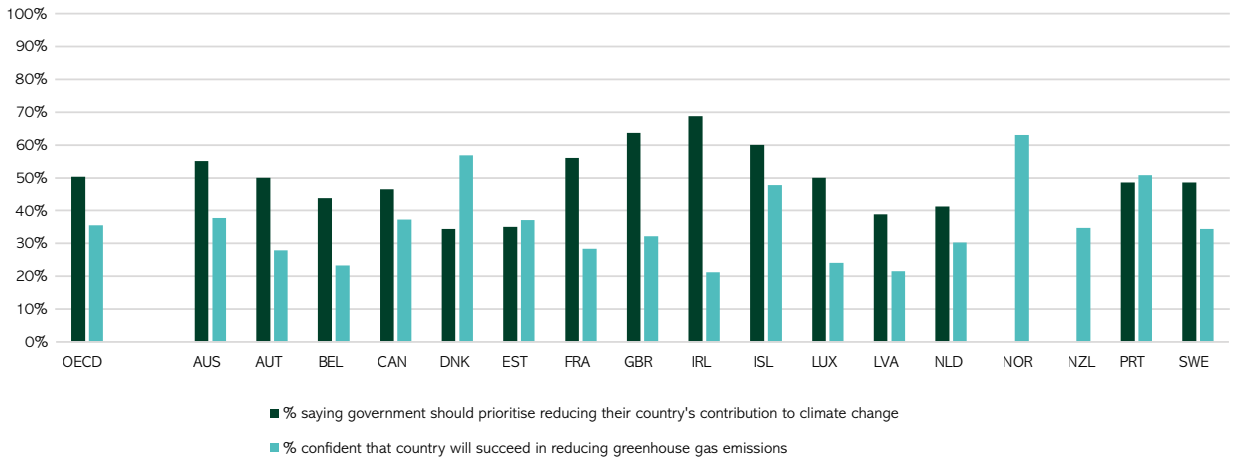
Concerning the energy debate and related solutions to combat global warming, respondents across all countries emphasised the importance of renewables. Almost two-thirds of EU (63%) and British citizens (59%) advocate for renewable energy, while half of the American respondents shared this sentiment. The American respondents showed a higher support for natural gas as a transition source (18%), compared to the United Kingdom (9%) and the EU (6%). Nuclear energy is a more appropriate option for the British (15%) and EU (12%), compared to American respondents (9%). Notably, a notable share of respondents, including American (17%), EU (17%), and British citizens (16%) indicate that energy savings should be prioritised.

When taking a broader view of socio-demographics, there is a telling trend in citizens' standpoints on climate change and their related perceptions. Those respondents who consider climate change to be the biggest challenge of this century for humanity are more inclined to endorse measures to mitigate its effects. This equally applies to those respondents who consider climate change an extremely pressing issue. However, the intergenerational divide in perceptions of climate change suggests the need for sustained education and communication strategies to engage all age groups. Furthermore, highlighting the potential societal and economic benefits can prove effective in fostering broader support for climate actions.

5.8.2. Citizens' perceptions of climate change and environmental protection policy

A significant share of EU (75%) and British citizens (69%) citizens believe they are more concerned about the climate crisis than their respective governments (EIB, 2022). More than half (59%) of American respondents also share this view (59%). About 51% of EU citizens, 49% of British, and 41% of Americans consider that the difficulty of solving the climate crisis is mainly due to the lack of proactive governmental engagement. Over half of the EU respondents indicate that national governments (63%), industries (58%), and the EU itself (57%) should be responsible for tackling climate change within Europe (EC, 2021). Since 2019, there has been a growing trend in the proportion of respondents attributing responsibility to these entities, with national governments and regional and local authorities being increasingly mentioned (+8% and +10% respectively).

Figure 31. Share of respondents who say the government should prioritise reducing the country's contribution to climate change and share of respondents who have confidence in their country's ability to reduce greenhouse gas emissions, 2021.



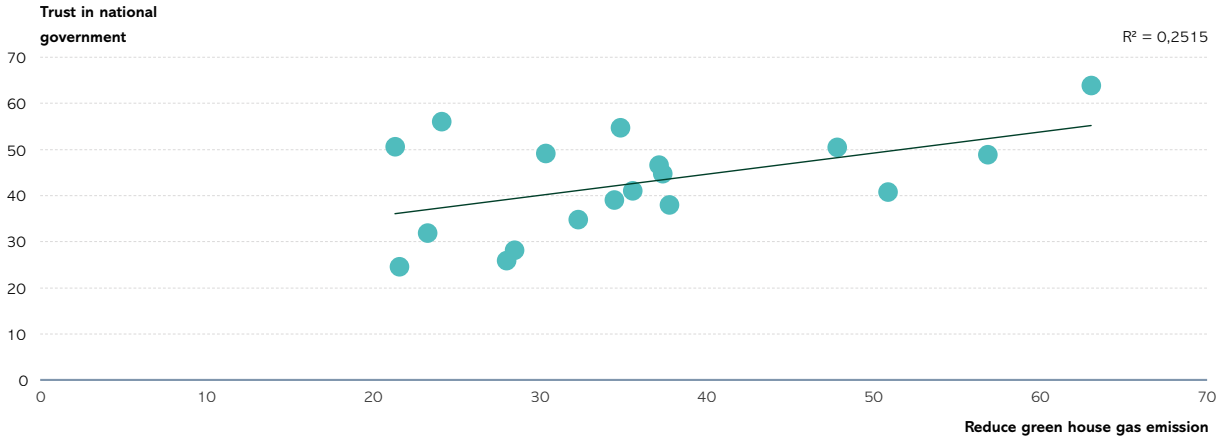
Source: OECD
Note: Half of respondents think their government should prioritise actions to reduce climate change, but only about one-third have confidence in their country's ability to reduce greenhouse gas emissions.

Generally, the public remains sceptical about the government's capacity to effectively tackle climate change. Approximately half (50.4%) of the respondents across OECD countries think that governments should make climate change a priority (OECD, 2022). When examining attitudes towards government commitment, subtle disparities emerge based on levels of trust in government. Across most policy areas, citizens who trust their national government are more inclined to advocate for government focus on forward-looking matters. This indicates that respondents' perceptions of government efficacy might be integrated into their long-term outlook on what governments can achieve.

A prevalent lack of trust in the ability of public institutions to competently and consistently implement effective policies for long-term benefits is evident. Notably, roughly one-third of respondents from OECD countries are optimistic about their nations successfully curbing their greenhouse gas emissions (Figure 31). In essence, while half of the respondents consider climate change a serious issue warranting government intervention, just over a third believe that nations will fulfil their objectives. Accordingly, the majority of EU (58%) and British (55%) respondents share the view that their countries will fail to substantially reduce carbon emissions, as pledged in the Paris Agreement.

Differences in attitudes are also influenced by age, as both the OECD Trust Survey and EIB Climate Change surveys reveal notable distinctions in issues with intergenerational implications. Young people in nearly all countries display a higher awareness of the climate crisis and the disposition to prioritise climate change action. Concurrently, younger generations display consistently lower levels of trust in their government and investment in policies that favour them

Figure 32. Share of respondents that are confident that their country will succeed in reducing greenhouse gas emissions over the next 10 years (x-axis) and the share who trust their national government (y-axis), 2021.



Source: OECD
Note: Countries that are seen as more competent in the fight against climate change also benefit from higher levels of trust in government.

The OECD Trust Survey's analysis reveals that people's confidence in a country's ability to reduce greenhouse gas emissions has a positive correlation with trust in the national government, and to a lesser extent, local government and civil service. Hence, investing in public governance toward effective climate change and environmental protection policies could further stimulate trust in the government. For instance, 75% of EU respondents believe that their national government's efforts against climate change are inadequate, while almost 90% consider that both national governments and the EU should establish more ambitious goals for energy efficiency and the share of renewable energy sources by 2030. The results of the latest EIB Climate Survey suggest that there is considerable support for stricter measures toward behavioural change to tackle the climate crisis, with 73% of British, 70% of EU, and 60% of American respondents indicating they would endorse such measures.

Certain challenges require more than just an accountable and adaptable national government. Rather, they demand sustained collaboration among various stakeholders. As the manifestation of climate change intensifies and the long-term benefits of climate action may seem rather distant, it is imperative for governments to enhance communication with the public regarding the merits of collective efforts to tackle these challenges.

CONCLUSIONS

The EIPA benchmarking study analysed the performance of 35 countries in ten policy areas. In this chapter, we examined the inputs, outputs and outcomes of policy areas of environmental protection and climate change. We first provided an overview of the inputs used by the countries for environmental protection purposes, such as environmental protection expenditure, environmental policy stringency index and environmental transfers. We then examined different indicators underlying the themes of air quality, water resources, waste management, energy, biodiversity and landscapes, as well as citizens' perception of climate change and environmental policy. In conclusion, this chapter identifies several trends and patterns which seem to suggest that the environmental protection and climate change sector is still facing significant challenges in terms of reaching different environmental targets. While the countries' expenditure on environmental protection remained relatively stable, ranging between 0.2% of GDP and 1.5% of GDP, their environmental policy stringency increased between 2000 and 2020 with France, Switzerland, Luxembourg and Finland having the most stringent environmental policies and the Netherlands having doubled its index.

In terms of air quality, considerable progress has been made between 2005 and 2020 in improving urban air quality and decreasing the emissions of most main air pollutants in Europe. A decrease in PM2.5 emissions was observed in all the examined countries. The emissions of methane (CH_4), ammonia (NH_3), sulphur dioxide (SO_2), nitrogen oxides (NO_X), black carbon (BC), carbon monoxide (CO) and non-methane volatile organic compounds (NMVOCs) also declined although at different rates. Finally, the GHG emissions declined considerably in most of the reporting countries between 1990 and 2020. One of the key contributors to these emissions reductions is the transition towards clean energy sources.

In terms of water resources, freshwater resources per inhabitant have been stable in most of the countries. Among the EU countries, Croatia recorded the highest renewable freshwater resources followed by Finland and Sweden. There are considerable differences in the amounts of water abstracted within the countries partially reflecting countries' size and resources available, but also abstraction practices, climate and the industrial and agricultural structure of each country. Regarding wastewater treatment, the share of the population connected to at least secondary wastewater treatment plants has been generally increasing over the past decades and is above 80% in most of the countries. The two countries with the highest share of population connected to a wastewater treatment plant by 2021, are the Netherlands and Luxembourg. Finally, the main sewage sludge treatment method varies within the EU: use as fertiliser for agriculture (e.g. Ireland), composting (e.g. Hungary), incineration (e.g. Netherlands) or landfill (e.g. Malta).

For waste management operations, the trends over time show a mixed picture between countries. Total waste generated per capita increased in 16 EU countries and decreased in the other EU countries. The best-performing countries in terms of either reducing or maintaining low levels of total waste generated per capita include Croatia, Cyprus, Denmark, Greece, Hungary, Ireland, Italy, Lithuania, Slovakia and Spain. Between 2010 and 2020, the landfilling of household and related waste declined by 57% (40.9 million tonnes), combustion waste by 30% (14.9 million tonnes), and other waste by 28% (9.3 million tonnes). However, the landfilling of sorting residues doubled to 17.6 million tonnes, indicating an expansion of the waste sorting sector and a shift from landfilling towards material recovery and increased recycling. Sweden, Belgium, Germany, Denmark, Switzerland, the Netherlands and Austria were among the countries that maintained the lowest municipal landfill rates. The countries that recorded substantial progress in reducing municipal waste landfill rates between 2010 and 2020 included Lithuania, Estonia, Slovenia, Finland, Ireland, Italy and Luxemburg. Concerning recycling, the countries that maintained higher recycling rates included Germany, Austria, the Netherlands, Luxembourg, Belgium and Switzerland. The countries that recorded significant improvements in recycling rates throughout the interval 2010-2020 included Lithuania, Slovenia, Slovakia, Latvia, Croatia, Czechia and Poland. When considering the figures for government expenditure on waste management, the best-performing countries with the lowest expenditure across all waste management operations include Austria, Germany, Lithuania and Switzerland. Since waste generation still tends to follow economic growth trends closely, substantial additional effort is required to achieve decoupling and realise a circular economy.

European countries importantly rely on energy imports, which calls for a re-evaluation of energy strategies and priorities. In 2020, over a quarter of the EU's greenhouse gas (GHG) emissions, inclusive of international aviation, were attributed to the energy supply. Over the past few decades, the EU has established ambitious climate and energy goals that target the broad adoption of renewable energy sources, as well as energy efficiency across sectors. In 2021, the EU countries that achieved substantial improvements in efficiency for primary energy consumption compared with the 2017-2019 average include Estonia, Portugal, Greece, Spain, Cyprus, Germany, Malta, Sweden, the Netherlands, Denmark, France, Luxemburg and Ireland. Among the non-EU countries, the United Kingdom and Canada had the most notable improvements in energy efficiency. When considering the share of energy from renewable sources, Sweden, Finland, Latvia, Estonia, Austria, Denmark and Portugal were among the EU countries that already achieved the EU target for the share of renewables for 2030, in 2021. The non-EU countries that recorded the highest shares of renewables included Iceland, Norway and New Zealand. While the variations among countries can be explained based on the differences in natural resource endowments, the current global developments call into question the long-term viability of fossil fuel infrastructure, adding to the imperative to accelerate the transition towards renewable energy sources that are both sustainable and economically viable.

Regarding biodiversity, all countries covered by this chapter have increased their share of terrestrial protected areas between 2000 and 2022 with the highest shares of terrestrial protected areas being recorded in Luxembourg, Bulgaria and Slovenia in relation to total land area, and Malta, Netherlands and Switzerland in relation to population density. At the same time, Germany, Belgium and France have the highest share of Natura 2000 marine protected areas, and Germany, Netherlands and Australia have the highest share of marine protected areas as a percentage of exclusive economic zones.

How environmental governance and policy are orchestrated significantly influences the credibility of public institutions. Concerning climate change and environmental protection policy, there is notable scepticism among citizens regarding the governments' capacity for significant action. This scepticism can be partly explained in view of the personal costs associated with climate policies. Citizens are generally hesitant to make immediate and lasting changes needed to address climate change, especially since the potential benefits often entail a long-term horizon. Across most policy areas, citizens who trust their national government are more inclined to advocate for government focus on forward-looking matters. This suggests that citizens' perceptions of current government effectiveness could influence their long-term expectations of governmental achievements. Differences in attitudes and perceptions are also influenced by age. Young individuals in almost all countries show greater awareness of and commitment to climate crisis solutions compared to older generations. Concurrently, these younger groups exhibit consistently lower levels of trust in their government and policies that would benefit them. To address climate change effectively, governments must foster and maintain public trust through genuine commitments that add to the perceptions of policy effectiveness. Balancing short-term costs with long-term benefits, and communicating these efforts effectively is key to securing public support for environmental policies.

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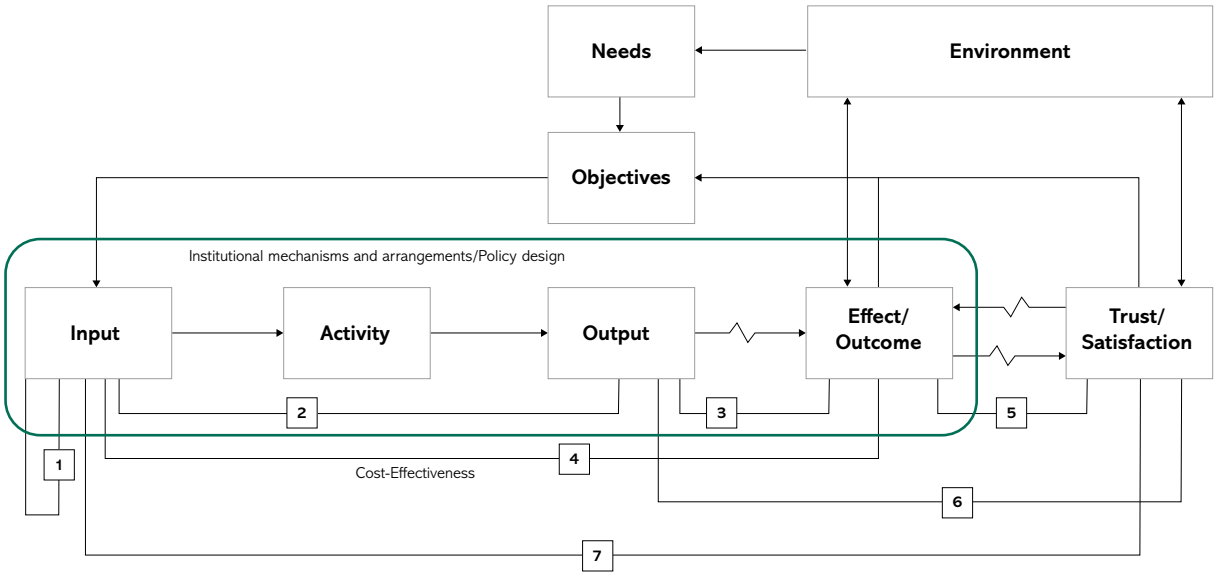
6. SYNTHESIS

The EIPA benchmarking study sets out to analyse the performance of public sectors in 35 countries in 10 policy areas. This report is the second of three sub-studies covering the areas of Economy, Infrastructure and Science, Technology and Innovation; Social Security, Employment, Income and Wealth; Environmental Protection and Climate Change.
In the respective chapters of this report, the results of the analysis in the three domains were reported in detail. In this concluding chapter, we synthesise these results intending to present an overview and to derive general conclusions.

The chapter is organised in line with the **conceptual framework**, which guided the analysis in the three policy areas (see Figure 1). The model distinguishes between output, outcome and impact, and includes the relationship between input and output, i.e. throughput and processes, and the efficiency of service delivery, as well as causal mechanisms to explain outcomes and the relationship between input and outcome related to cost-effectiveness.

Figure 1: Conceptual Framework



Source: Bouckaert and Halligan 2008:16 (modified)

Environment, needs and objectives

In general, the concept of environment can be seen as the social, economic and political context of a specific public service. Hence, each of the policy areas covered in the respective chapters is embedded in very different environments. However, despite these differences, some general observations can be made.

First, policy environments are essential for shaping the delivery of public services, and thus contribute to output and outcomes in the respective policy areas. While these environments partly explain differences in the countries' performances, they are also the factors which are least receptive to policy changes and interventions in the context of public sector management. Since policy environments provide political and societal demands, and thus shape the needs and objectives of a specific policy area, they can be seen as the most stable factors of public sector performance.

For instance, system characteristics of public administrations are deeply embedded in the wider context of political systems, shaped by deep-rooted beliefs about the desirability of state structures or electoral representation, to name just two. Likewise, the varying social security policies in the 35 countries are the result of long political processes. These processes reflect cultural trends about desirable social structures.

Second, the environments of the respective policy areas cannot be neatly separated. Arguably, public administration can be seen as the underlying foundation of service delivery in all policy areas, including the ones covered in this report. However, specific policy areas also affect each other. For instance, social security is at least to some extent, related to economic performance and is therefore embedded in variations of welfare systems.

Input and activities

Inputs consist of monetary and non-monetary resources that are necessary to carry out certain activities, resulting in outcomes related to service delivery. Their availability and allocation are closely related to exogenous factors in which governments have to operate, such as recessions, pandemics and inflationary pressures.

In general, the analysis of inputs in the three respective policy areas indicates that the role of governments in public service delivery is increasing, which supports the assumption of a 'return of the state'. The three chapters highlight that public expenditure has either remained stable or increased during the analysed timeframe.

For instance, social spending has substantially increased between 2007 and 2020, as a response to the financial crisis and the Covid 19 pandemic. That was a consequence of the loss of income and increase in unemployment caused by both events.

Expenditure on environmental protection and climate change have experienced little variation in the period of consideration at the national level. However, a substantial contribution has come from the EU budget, amounting to 20% of its total resources in the programming period 2014 -2020, and which increased to 30% in the current 2021 – 2027 financial perspective.

Government investments in R&D, transport infrastructure and public buildings increased or remained stable in most regions, although it declined in Southern Europe. The region was hit very heavily by the financial crisis and suffered as a consequence of the budget cuts that were implemented as a response.

Significant differences within countries in terms of non-monetary inputs are observed in the three policy areas. Social security policies such as employment protection regulation, pension schemes and protection against poverty vary substantially from country to country.

The stringency of environmental protection policies has increased overall across countries, but significant differences can be identified in its level. This underscores the challenges that still persist in countries' common effort against climate change.

Inputs in the domain of innovation, intended as political, educational and infrastructural factors contributing to the adoption of new technologies, have improved across countries over the last decade. However, important differences are observed between regional clusters.

These variations highlight that while countries face similar challenges, their starting points, environmental characteristics and thus opportunities for improvement differ significantly.

In light of such diversity, knowledge dissemination, sharing of best practices and mutual learning should be based on deriving lessons from examples with high levels of achievement and excellence. Yet, at the same time such lessons have to be implemented in diverse social, political and economic contexts. Hence, public sector management, i.e. interventions to improve the efficiency and effectiveness of government action to produce and deliver services should be tailor-made, fitting the specific needs and objectives of the respective country and policy area.

To facilitate such mutual learning, the respective chapters in this study relied on regional and conceptual categorisation to allow for comparisons between countries with similar system characteristics. While all countries face the twin challenges of green and digital transformation, the conditions in which such challenges are manifested affect choices regarding the type and scope of public sector intervention.

Output and outcome

Whereas outputs are the intermediate product of service delivery, outcomes refer to societal, economic and political results in a longer time frame. In the field of Economy, outputs were defined in this study as economic activity, measured by the Gross Domestic Product (GDP). In the field of Social Security, economic growth, its distribution and social transfers received, are key output indicators. In the domain of environmental protection, outputs vary according to the themes addressed in each section of the chapter. The long-term results of input, activity and output are specific to the societal, economic and political needs and objectives of each policy area.

The respective chapters provide an in-depth analysis of the development of these indicators including cross-country comparisons. By and large, results are mixed in all policy areas. In the field of Economy and Innovation, for instance, GDP per capita has remained relatively stable over time, albeit at different levels across countries, whereas the level of ICT infrastructure has increased across the board.

In the field of Environmental protection, it is encouraging to observe an improvement in terms of air quality, even though this happened at varying speeds. At the same time, the performance in the domain of waste management has been rather mixed, with some countries even increasing their waste production.

In the domain of Social Security, it emerged that while income and wealth inequality have generally remained stable, in most countries there has been an increase in poverty.

In general, the causal links between input, activities and output or outcomes are subject to uncertainty due to the complexity of public service delivery in a diverse set of countries and policy areas, with significant variation in terms of system characteristics in which such services are being delivered. For instance, the size of social expenditure is only slightly correlated with the level of social protection and poverty reduction. This could be possibly explained by the fact that social security policies mainly focus on the protection of pre-existing incomes, instead of the reduction of income inequality. Furthermore, the links between input and output or outcomes are essential indicators for the efficiency of service delivery.

In the domain of Economy, a positive correlation is observed between the growth rate of public and private investment and that of GDP; however, the effectiveness of investment varies considerably among regional clusters. The Covid-19 pandemic and rising energy prices have caused a decrease in investment and a weakening of the relationship between the two indicators.

Similarly, in the field of Environmental protection, while almost all countries decreased their use of landfills for municipal waste, sizeable differences between countries persist. Perhaps surprisingly, it emerged that several of the best-performing countries are actually among those spending less on waste management. To allow for a better understanding of these links, the respective chapters employed various methods to correlate specific input and activity factors with performance levels measures as output and outcome. As it was previously mentioned, facilitating mutual learning based on this understanding also relies on regional and conceptual categorisation as part of such analysis.

Satisfaction and trust

An essential element in the analysis of public sector performance is the satisfaction of citizens with the quality of service delivery. Satisfaction can be seen as an indicator of service quality, but it is also related to trust in government, which is essential for governance systems based on democratic principles.

The chapters produced interesting results in this domain. Inequality and poverty are negatively correlated with trust in government. Moreover, the comprehensiveness of social policy is positively correlated with trust, albeit less evidently.

Citizens' confidence in innovation and their propensity to adopt new technologies has generally increased, even though at very different levels between countries. An overall improvement in terms of satisfaction with transport systems has been recorded, although in a few cases there has been a deterioration.

The public is by and large sceptical of governments' ability to effectively tackle climate change. Citizens are also wary of the personal costs and sacrifices that climate policies entail. This hesitancy has been reinforced by the recent increase in inflation and by proposals to introduce new taxes to pay for the green transition. On a positive note, it has emerged that citizens are relatively less sceptical of environmental policies in countries where trust in government is higher. This underscores the importance of gaining the public's confidence before adopting the bold policy decisions required by the current climate crisis.

As mentioned above, there is significant variation across regions and countries as well as over time. Moreover, similar to outcome indicators, multidimensional concepts such as trust are contingent on various systemic and individual socio-economic factors. Since most satisfaction and trust indicators are based on citizens' perceptions there is also a methodological challenge of interpreting diverging results between objective and subjective indicators. Hence, in case such perceptions diverge from the actual quality of service delivery, results have to be interpreted carefully and public sector interventions should be designed to take into account possible measurement errors.

7. LIST OF AUTHORS

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Frans van Dongen is a programme manager on public performance at the Ministry of the Interior and Kingdom Relations in the Netherlands. In this position, he is responsible for the development, exploration and dissemination of empirical and practical knowledge about the performance of the public sector including drivers for success, efficiency, effectiveness, and innovation. He acts in close collaboration with various partners, both nationally and internationally. The purpose of these actions is to inspire and support government organizations to improve their performance. In addition, he is the representative of the Ministry of the interior and Kingdom Relations at EIPA's board of governors and the Dutch member of the steering committee for the European Public Sector Awards.

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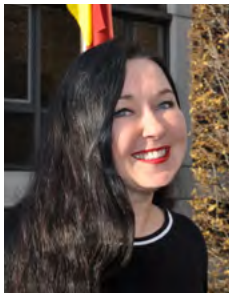

Iwona Karwot is the Project leader for the present Benchmarking Study, 2022-2025, working in close cooperation with the Ministry of the Interior and Kingdom Relations in the Netherlands. In particular, she oversaw the planning and preparation of the content and budgeting proposal of the project. She has conducted the negotiations of the subjects and the involvement of experts for the full length of the study. Iwona is a Senior Lecturer at EIPA, specialising in cohesion policy programming, implementation, audit anti-fraud measures. She is developing and running of seminars in close cooperation with the European Court of Auditors and the EU Commission. In 2021 she co-authored 'The Gender Gap in the EU's Public Employment and Leadership', for the European Parliament. Before joining EIPA in 2008, she worked as an Associate Senior Lecturer of Postgraduate Studies in European Union Funds at the University of Łódź and the Catholic University of Cardinal Stefan Wyszyński, as a lecturer for the Academy of Human and Economic Science in Zamość and the Centre for European Studies in Strasbourg. She holds an MA in Political Science and European Institutions, and a PhD in Regional Policy and International Relations.

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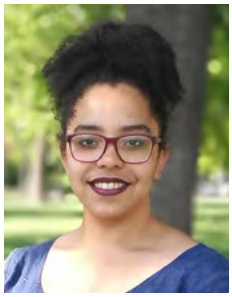
Paolo Giovanetti contributed to the drafting and supported the authors of the chapters in the use of data. He also contributed to the design and creation of the interactive Power BI dashboards visualising the data from each policy area. Paolo joined EIPA Maastricht in 2022 as a Research Assistant, working in the Effective Public Administration team. His interests lie at the intersection of politics and economics, with a particular focus on quantitative analysis and cross-country comparison. Before joining EIPA, Paolo studied at the London School of Economics where he obtained a Master of Science in Political Science and Political Economy. He also holds a Master of Arts in Political Economy from King's College London.

Miranda Lovell-Prescod



Miranda Lovell-Prescod contributed to the drafting and supported the authors of the chapters in the use of data. Additionally, she contributed to the design and creation of the interactive Power BI dashboards visualising the data from each policy area. Miranda joined EIPA Maastricht in 2021; she works as a Researcher in the field of Public Policy Evaluation and Impact assessment. Before joining EIPA she was working at Maastricht Graduate School of Governance (Maastricht University/ United Nations University-MERIT) as a Teaching Assistant providing quantitative and econometric assistance. In the past she has been interested in social protection, multi-dimensional poverty indices, conditional-cash transfer programmes, and the effects of corruption on human development. Miranda has a double-MSc in Public Policy degree from Maastricht University and UNU-MERIT and a MSc in Economics from the School of Business and Economics at Maastricht University.

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ECONOMY, INFRASTRUCTURE AND SCIENCE, TECHNOLOGY AND INNOVATION

Daniel Díaz-Fuentes

Daniel Díaz-Fuentes is Full Professor of Economics at the University of Cantabria, Spain and elected President of the World Economy Society. His research activity is focussed on Public Services Innovation, Privatisation, Public Enterprises, European Financial Institutions and Development and Investment Banks, and the mainstream is in the fields of Economics and Public Management. He has led and participated as principal researcher in several European Union and International research projects such as EU VIIFP COCOPS: Coordination for Cohesion in the Public Sector from 2011 to 2014, COST: The Emergence of Southern Multinational and their impact on Europe 2011-2014, EIB-EIBURS: The History of European Infrastructure Finance, 2011-2014, The Mario Einaudi - Cornell University: Comparing the finance of public infrastructure in Europe and the United States 2014-2015; H2020 CITADEL: Empowering Citizens to Transform Public Administrations 2016-2019, FEPS: The Rise of Promotional Banking in Europe 2018-2020. H2020 TOKEN: Transformativeimpact of distributive Technologies in Public Services 2020-2023, and Horizon Europe GREENPATHS: European Knowledge Hub for Just Transition Pathways 2023-2026. He has a long-term publication trajectory with more than100 articles in journals in various disciplines such as *Journal of Common Market Studies, Cambridge Journal of Regions, Economy and Society, Journal of European Public Policy Regional Studies, Economy and Society, Public Administration, Public Management Review and IEEE Access.* He served as an expert in the Council of Europe Development Bank in 2021-2023. He is an associate editor for 'Journal of Economic Policy Reform', and several other leading international academic journals. He spent academic and research visits at, among other universities at, Oxford (1993-1995), Cornell (2014-2015), European University Institute (2006-2007, Manchester-UMIST (1999), LSE (1996) and Michigan (1992).

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Judith Clifton is Full Professor in Economic and Public Policy at the Faculty of Business & Economic Sciences, University of Cantabria and Editor-in-Chief of Journal of Economic Policy Reform. She is currently Principal Investigator of Greenpaths, a HorizonEurope project on Just Transition, and FNR Intermobility-In Visiting Professor at the University of Luxembourg. In addition to serving as Editor-in-Chief of Journal of Economic Policy Reform she is Co-Editor of Cambridge Journal of Regions, Economy & Society and Cambridge Elements in Public Policy and serves on Policy & Society, Journal of Comparative Policy Analysis, Utilities Policy, Policy Design and Practice and Annals of Public and Cooperative Economics editorial boards. She has published widely in international peer reviewed journals and books on public services and public banks in Europe and Latin America. For more information please see https://www.judithclifton.com/

SOCIAL SECURITY, EMPLOYMENT, INCOME AND WEALTH

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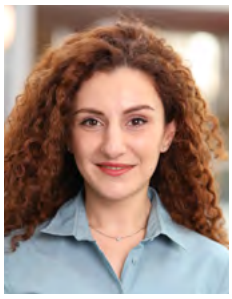
'Former director of the division for economic and social policy of the Friedrich Ebert Foundation

Michael studied mathematics, economics and development policy in Aachen, Paris and Berlin. He worked with the German Foundation for International Development and since 1980 for the Friedrich Ebert Foundation (FES) in its research institute in Lisbon, in the cooperation with Central and Eastern Europe and, from 2000 through 2006, as head of the International Policy Analysis Unit. From 2006 to 2013 he has been director of the Division for Economic and Social Policy of the FES. His research focuses on international political economy, European integration and Germany's economic policy. His publications can be found on his homepage www.dauderstaedt.de.

ENVIRONMENTAL PROTECTION AND CLIMATE CHANGE



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Emma Avoyan is an assistant professor of planning and environment at the Chair Group of Spatial Planning at Radboud University Nijmegen. Her research interests broadly concern collaborative modes of governance with a focus on socio-political and spatial aspects of sustainability and environmental governance. She studies the politics and management of water resources and has a growing interest in circular economy, performance management and co-innovation.

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Iulian Barba Lata is an assistant professor of Spatial Planning at Radboud University Nijmegen. He is mainly interested into how cities are governed, contested and transformed. This includes research on three topical lines of enquiry: (1) the future of public spaces, (2) emergent sustainability agendas and infrastructures, and (3) the rural-urban condition. His work draws inspiration from a diversity of critical, relational and participatory approaches in problematizing responsible forms of urbanization.

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