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Measuring sustainable and inclusive wellbeing: a multidimensional dashboard approach

Benczur, P., Boskovic, A., Giovannini, E., Pagano, A., Sandor, A.-M.

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Joint Research Centre

EUR 40166

Contact information:

Name: Peter Benczur

Email: peter.benczur@ec.europa.eu

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Contents

Abstract

Announced in the 2023 Strategic Foresight Report of the Commission, the sustainable and inclusive wellbeing initiative recognizes the usefulness of GDP but also the need for complimentary indicators to fully capture all aspects of the quality of life, inclusiveness, and sustainability.

One of its main objectives is to develop a multidimensional dashboard, which integrates existing tools and frameworks into a set of indicators that provide a holistic view of the wellbeing of people and the planet. This development involved a rigorous process in an inter-service working group, narrowing down over a thousand potential measures to a comprehensive dashboard of 140 and eventually 50 indicators.

Besides documenting the process, this report presents some preliminary analyses based on the dashboard of 50 indicators and the corresponding synthetic indices. The analysis shows that the state of wellbeing and its components in the European Union varies across Member States, presenting important examples of a decoupling of wellbeing from income. While there is a general correlation between economic prosperity and wellbeing, there are notable exceptions and trade-offs between different aspects of wellbeing.

In times of renewed discussions around the need to boost EU's competitiveness in a way that maintains the important achievements of the EU approach to prosperity, the SIWB dashboard can be a central monitoring tool to make sure that reigniting Europe's economic engine does not become an end in itself but rather a means for delivering wellbeing to all people of the current and future generations, and to the planet.

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All the remaining errors are ours.

Authors

Peter Benczur

Ana Boskovic

Enrico Giovannini

Andrea Pagano

Alina-Mihaela Sandor

Executive summary

The sustainable and inclusive wellbeing (SIWB) initiative emerges as a response to the growing awareness within the European Union and the world that social progress extends beyond economic growth, hence its measurement needs to go beyond economic indicators such as Gross Domestic Product (GDP) and its growth. SIWB reflects the EU's commitment to policies that promote the wellbeing of all Europeans as enshrined in the Treaty on European Union, adding value to previous policy support work that integrates economic, social, and sustainability aspects, by providing a new framework for measuring wellbeing, inclusiveness, and sustainability. It also comes at the right time to support Europe's positioning within the global discussion on 'beyond GDP' indicators as recently reinforced by the UN's Pact of the Future.

Announced in the 2023 Strategic Foresight Report, the SIWB initiative recognizes the usefulness of GDP but also the need for complimentary indicators to fully capture all aspects of the quality of life, inclusiveness, and sustainability. It also replies to the call in the 8th Environmental Action Programme, which calls for the development of a summary dashboard to measure economic, social, and environmental progress 'beyond GDP'. The JRC report published in June 2024 outlines the multidimensional SIWB framework agreed within the inter-service working group of the European Commission, guiding the development of 'beyond GDP' metrics: an SIWB dashboard of indicators and experimental augmented-GDP type metrics within the scope of complementing official statistics.

The SIWB multidimensional dashboard integrates existing tools and frameworks into a set of indicators that provide a holistic view of the wellbeing of people and the planet. In line with the SIWB framework, the dashboard structure comprises six components—*wellbeing today, social and economic resources for future wellbeing, resilience: societal challenges and sustainability transitions, nature and planetary boundaries, inclusiveness*, and *institutional capacity and quality.* The selection of indicators for the SIWB framework involved a rigorous process, narrowing down over a thousand potential measures to a comprehensive dashboard of 140 indicators. These indicators were chosen based on their relevance, data quality, and their ability to provide a holistic overview of inclusive and sustainable wellbeing.

Recognizing the need for a more streamlined tool for policymakers and public communication, the working group also developed a summary dashboard with 50 key indicators and created summary synthetic indices. In parallel, DG RTD commissioned a study "New Metrics for Sustainable Prosperity: Options for GDP+3", which in a related effort aims to identify three possible indicators from the social, environmental, and institutional domains to complement GDP. This set could correspond to the "top layer" of the two larger SIWB dashboards.

Besides documenting the process, this report presents some illustrative analyses based on the streamlined dashboard of 50 indicators (a shorter and less technical analysis is available as JRC141068). *Its core text is followed by an extensive set of Annexes, which document also the underlying indicator selection process. They aim only at the technically interested readers*.

To facilitate the interpretation and communication of the indicators, we present dashboards with relative values of the indicators and the corresponding summary synthetic measures. The dashboards show that the state of wellbeing and its components in the European Union varies across Member States. These differences can be attributed to a range of factors such as economic conditions, social policies, or healthcare systems.

Northern and Western EU Member States record the highest overall levels of sustainable and inclusive wellbeing, while Eastern and Southern Member States show a weaker situation. The countries with the highest overall wellbeing, including its different aspects and facets, are Sweden and Finland, while Denmark, Ireland, Netherlands, Luxembourg, and Austria are characterized by above-median situation in all areas except spillovers, where they place towards the bottom of the distribution, and nature, where they remain only around the middle of the distribution. While these countries have some of the highest GDP per capita among the Member States, Estonia and Slovakia stand out with their above-average overall wellbeing, contrasted by below-average GDP per capita, serving as an example of the potential decoupling of wellbeing from income. Over the last decade, sustainable and inclusive wellbeing in the European Union has shown a positive trend, with improvements in various aspects of life, including employment, education, healthcare, and environmental sustainability.

The SIWB framework reveals that while there is a general correlation between economic prosperity and wellbeing, there are notable exceptions and trade-offs between different aspects of wellbeing. The analysis highlights the importance of considering the social, economic, environmental, and institutional dimensions of prosperity in policymaking, rather than relying solely on economic indicators. The framework also underscores the need for targeted interventions to address existing vulnerabilities and to promote the wellbeing of current and future generations. Furthermore, the findings suggest that investing in institutional quality, social and economic resources for future wellbeing, and environmental sustainability can have positive impacts on overall wellbeing, and that a balanced approach to policymaking can help to mitigate tensions and trade-offs between different aspects of wellbeing.

The SIWB framework could serve to guide policy assessment and monitoring, enabling a deeper understanding of how various factors contribute to the overall wellbeing of EU citizens. It can support EU policies that aim to balance economic aspects of wellbeing with sustainability and social equity. At the same time, the frameworks and indicators underline trade-offs and synergies between the different aspect of wellbeing, but also between wellbeing today and tomorrow, which includes a potential entry point to apply a long-run lens to policy making to ensure intergenerational fairness.

In times of renewed discussions around the need to boost EU’s competitiveness, it is central that reigniting Europe’s economic engine does not become an end in itself but rather a means for delivering wellbeing to all people of the current and future generations, and to the planet. Therefore, the framework is not only a step towards a more nuanced understanding of the achievements of the EU approach to prosperity but also a guiding force for more comprehensive policymaking that aligns future economic policies with the EU's long-term objectives of peace, sustainability, and the wellbeing of its peoples.

1 Introduction

Wellbeing as an objective is enshrined in the Treaty on European Union[1], and there is a wide range of related activities across the Commission, reflecting the political attention given to the quality of life, social equity, intergenerational fairness and sustainability. For example, the UN Sustainable Development Goals and the European Pillar of Social Rights are now reflected in the European Semester's competitive sustainability framework[2] (European Commission 2023a, addressing fairness and environmental sustainability aspects in social and economic policy coordination). In addition, there are a number of national and international initiatives focusing on wellbeing beyond traditional economic metrics, pioneered by the OECD's Wellbeing Framework and reinforced at a multinational level with the UN's "Our Common Agenda" (United Nations, 2021) and the "2024 Summit of the Future"[3].

Despite the growing interest in wellbeing and moving beyond growth, GDP and its growth remain the most important economic indicators that serve as a gauge of the overall state of an economy with policymakers relying heavily on this indicator to form economic policy decisions across the whole policy cycle. While GDP remains important in these processes, the need to fully capture all aspects of the quality of life and sustainability is growing. Environmental and social aspects are already reflected in many public and private sector decisions, but they need to be further mainstreamed. Economic prosperity needs to be pursued together with the European social and sustainability goals. In wake of the renewed focus on reinvigorating European productivity, it is important to ensure that economic growth does not come at the expense of these goals but supports their achievement. This was recognized also by Mario Draghi in his work of setting direction for the future of European competitiveness: "Productivity growth is not only related to living standards. It has to do with being able to deliver on our values, of prosperity, equity, security, and independence[4]."

To progressively complement the use of GDP with wellbeing indicators in EU policymaking, the 2023 Strategic Foresight Report (SFR)[5] has announced the launch of Commission work on developing sustainable and inclusive wellbeing (SIWB) metrics. This work also can be seen as a response to the call of 8th Environmental Action Programme for "developing a summary dashboard and indicator set measuring 'beyond GDP', based on, inter alia, a targeted consultation with all relevant stakeholders as well as a report which identifies the interlinkages between existing indicator sets, monitoring frameworks and processes at Union level measuring social, economic and environmental progress and which proposes action on how existing dashboards and indicator sets can be streamlined" (article 3E of European Parliament and the Council, 2022).

In response to these calls, Commission services and the European Environment Agency reflected internally in an inter-service working group (ISWG) on an integrated approach to wellbeing and its measurement. They adopted an approach for going beyond GDP, by assessing "the wellbeing of all people of current and future generations, and of the planet". This has led to the development of a

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1 Article 3(1) TEU says: "The Union's aim is to promote peace, its values and the wellbeing of its people".

2 The four dimensions of competitive sustainability include macroeconomic stability, environmental sustainability, productivity and fairness, see European Commission, 2023a.

3 Summit of the Future 2024 - United Nations | United Nations

4 See the transcript of a conversation with Mario Draghi at Bruegel in September 2024, https://www.bruegel.org/event/future-european-competitiveness-conversation-mario-draghi#tab-video, minutes 5-6.

5 European Commission (2023b)

prototype sustainable and inclusive wellbeing framework, which later guided the development of a multidimensional indicator dashboard and experimental augmented-GDP type metrics[6]. The dashboard work also includes a version with a limited number of indicators, more suitable for broad communication purposes.

The SIWB framework provides a comprehensive approach to understand and measure wellbeing, considering the interplay of social, economic, and environmental factors, as well as the importance of resilience, nature, and governance. It acknowledges the rapid changes in our societies and economies and emphasizes the need to sustain and enhance the unique European quality of life.

Furthermore, the SIWB framework is designed to support decisions that respect planetary boundaries and advocate for intergenerational fairness, ensuring that decisions taken today do not harm future generations and that there is increased solidarity and engagement between people of different ages. It may be an entry point to strengthen cross-sectoral collaborations, moving out of silos, in both EU decision making as well as when partnering with external stakeholders.

By integrating these various dimensions, the SIWB framework offers a holistic and inclusive perspective on wellbeing and sustainability, ensuring that the prosperity we build today is equitable and enduring. It underlines the need for concerted efforts to deliver a society that is not only prosperous but also cohesive, just, and mindful of the legacy we leave for the years to come. The proposed framework and the current selection of indicators for the SIWB comprehensive and streamlined dashboards have been selected based on scientific and subject-specific expertise, statistical analysis and ISWG stakeholder discussions[7]. It is consistent with the "New Metrics for Sustainable Prosperity: Options for GDP+3" study commissioned by DG RTD (Charveriat et al, 2024), that complements this work by identifying three possible indicators from the social, environmental, and institutional domains to complement GDP. In addition, lessons from leading wellbeing frameworks (e.g. OECD) have been used to perform crosschecks. The final allocation of indicators into the two, different sized dashboards, and discussions on their practical use are still an ongoing process. This will build on continuous exchanges with Commission services and other stakeholders. Adopting a Commission-wide approach is essential, as it plays a pivotal role in advancing the core values and principles of the European Union.

Finally, this work closely aligns with the UN Secretary-General's Our Common Agenda initiative and the recently adopted "Pact of the Future" (United Nations, 2024), with 'beyond GDP' as one of its focal points, the envisaged update of the System of National Accounts, and the ongoing review of the System of Environmental and Economic Accounts. All these may be combined to feed into the development of an overarching UN framework for inclusive and sustainable wellbeing (United Nations Network of Economic Statisticians, 2024). This overarching framework could be further reinforced by the creation of a system of population and social accounts (SPSA).

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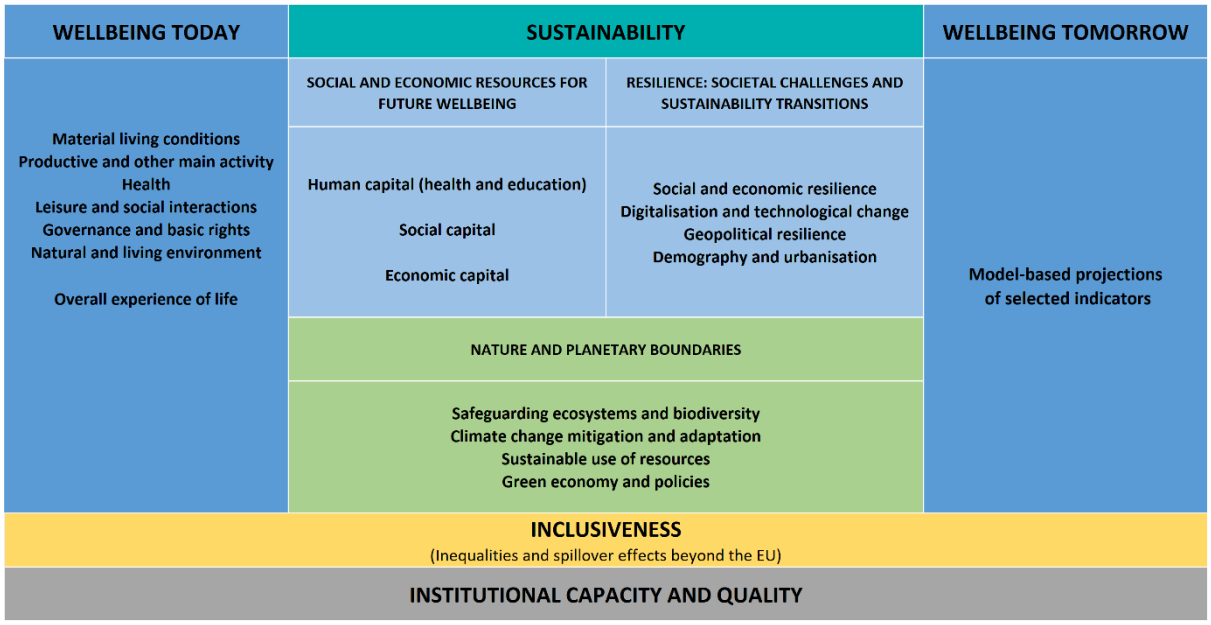
6 For an example of augmented-GDP case, see Benczur, Kvedaras and Preziosi (2023).

7 While unofficial consultations with the set of Commission services started a year before, the official launch of the inter-service working group (ISWG) was in March 2023. The ISWG met eight times until the summer of 2024, when the choice of the indicators for both dashboards have been finalized.

2 The structure of the framework

This section is a brief review of the detailed structure of the framework elaborated in the previous report "Sustainable and inclusive wellbeing, the road forward" (Benczur et al, 2024). To move towards monitoring SIWB, the framework is translated into a detailed structure, which is presented in Figure 1. It depicts the various components and dimensions of SIWB and serves as the organisational basis for the selection of the indicators. Relative to the original version, there are two notable changes. First, the two components of nature (status and endowment for the future versus resilience and planetary boundaries) have been merged into a single component due to many potential overlaps and commonalities among respective subcomponents and the relatively low number of indicators in each. Second, the dimensions (and the underlying subdimensions) have been streamlined to reflect data availability and a better balance across the dimensions (in terms of the number of indicators they may contain).

Figure 1. Main components and their dimensions of the SIWB framework (revised)



Source: by the authors, from Benczur et al. (2024).

The **components** refer to the **major elements of the framework**[8]:

1. **Wellbeing today**, that refers to all the relevant aspects of the quality of life, including how different population groups and territories experience and perceive it.
2. **Social and economic aspects of sustainability**, which includes **social and economic resources for future wellbeing** and aspects of **resilience** with respect to **societal challenges and sustainability transitions.**
3. **Nature and planetary boundaries, which includes all environmental aspects of sustainability in a unified fashion,** including the status and condition of nature **(as an endowment, a source of contributions to people, and a resource for the future),**

[8] See Annex 1 for more information on each component.

aspects of **resilience** with respect to **nature-related challenges, and the planetary boundaries**.

4. **Wellbeing tomorrow**, which would contain model-based projections of selected indicators of wellbeing and inclusiveness. Though added here only as 'placeholders', explicit measures of future wellbeing could reveal ongoing trends and emerging challenges better than statistical measures of capitals and resilience. At the same time, they would need to rely on modelling choices and assumptions.
5. **Inclusiveness**, which collects the key fairness and distributional aspects of wellbeing across all the other components and subcomponents. It also includes **international spillovers**, capturing far-reaching environmental and social impacts to other countries.
6. **Institutional capacity and quality**, which points to fundamental characteristics that institutions and governance need in order to ensure the delivery of current and future wellbeing in a fair distribution, intergenerational justice, and the capacity to face challenges and navigate transitions (resilience).

3 From the pooled indicators to the SIWB dashboard

The SIWB framework is grounded on several selected existing Commission monitoring tools[9]. Together with several international existing frameworks, they provided the initial foundation for a comprehensive review of all available indicators, leading to the subsequent prioritization among them. Indicators from these tools were regrouped, streamlined and subsequently allocated to contribute to different components and dimensions of SIWB, highlighting synergies and complementarities and avoiding the overlaps. The linkages among the SIWB framework and the EU SDG indicator set require particular attention, as the latter represents one of the most prominent holistic frameworks adopted by the Commission. Major identified gaps were addressed by searching for other sources, or by providing recommendations for future data collection.

A first stock-taking of such tools has been developed and the indicators were mapped into the structure of the SIWB framework (as summarised in Table 1), to analyse their links with the proposed SIWB framework and to shed light on the similarities, complementarities and gaps between them. In addition, this mapped list of indicators is the natural starting point to fill the framework.

Table 1. Mapping of monitoring tools to SIWB components: coverage by components based on a sub-dimension-level analysis

		EC									non-EC	
LEGEND Score describing the coverage considering both the number of subdimensions covered and the number of indicators in each subdimension: ● over 0.67 ● 0.33 to 0.67 ● 0 to 0.33 ○ 0		EU SDGs 2022	Quality of Life	Social scoreboard	Resilience Dashboards	TPI	EU Regional SPI	8th EAP	Statistics for EGD	Circular Economy	**ES Country Reports**	OECD	The Doughnut
	Wellbeing today	●	●	●	●	●	●	○	●	○	●	●	●
Sustainability	Social and economic resources for future wellbeing	●	●	●	●	●	●	○	●	○	●	●	●
Sustainability	Resilience: societal challenges and sustainability transitions	●	●	●	●	●	●	○	●	●	●	●	●
Sustainability	Nature and planetary boundaries	●	○	○	●	●	●	●	●	●	●	●	●
	Inclusiveness	●	●	●	●	●	●	○	○	○	●	●	●
	Institutional capacity and quality	●	○	○	○	●	●	○	○	○	●	●	●
	Total number of (mapped) indicators	**100**	**103**	**39**	**119**	**27**	**55**	**24**	**25**	**22**	**155**	**79**	**28**

Notes: The 'coverage score' of each cell is constructed as follows. At the sub-dimension level, a 0 is assigned if there were no corresponding indicators (no coverage), 0.5 if there was one corresponding indicator (some coverage) and 1 if there were at least two corresponding indicators (good coverage). The component score is the average of all the sub-dimension scores.
Source: by the authors, from Benczur et al. (2024).

The results of the mapping exercise show that many of the existing tools are sectorial and thus depict only specific aspects of SIWB (the mapping of a selected subset of the frameworks will be adjusted to reflect the revised structure of SIWB). This points towards a lack of an overarching, or

[9] The list of selected monitoring tools and frameworks can be found in Annex 4 of Benczur et al. (2024). These are a subset of all Commission monitoring tools, covering aspects linked to SIWB. The selection was done during the exploratory discussions before the 2023 SFR.

holistic, EC monitoring tool a gap which the SIWB might fill. Some important elements of SIWB are not consistently covered across different frameworks, such as social and natural capital/endowment, or resilience related to digital, demographic, and geopolitical challenges. There are also gaps in relation to inclusiveness, particularly when it comes to spillover effects beyond the EU ('wellbeing elsewhere', for example, the carbon content or environmental footprint of EU imports). The definition and indicators of SIWB should be tailored to the EU needs and key political objectives, related for instance to the ongoing sustainability transitions and intergenerational solidarity (i.e., wellbeing needs to be maintained over time for future generations).

We have started from pooling all the (mapped) indicators, a total of 1116, of the relevant frameworks and methodically progressed towards refining these into a final, curated set of 140 indicators, which now constitute the comprehensive dashboard. Throughout each phase, a set of selection criteria[10] was systematically applied to inform our decision-making process, ensuring that we struck a balance between the relevance and availability of alternative indicators.

The process of reducing the number of indicators involved a multi-step approach, consisting of the following stages:

- Identifying and eliminating the complete or near-complete overlaps[11] among these indicators has led to 466 indicators. They were the starting point for the further indicator prioritization exercise in the ISWG.
- The prioritization exercise consisted of consulting the relevant Commission services on the relative importance of each indicator based on the specific expertise in each policy area. The outcome of the two rounds of prioritization exercise led to 155 indicators.
- In the next stage, the 153 indicators were assessed in terms of their data availability and quality. After eliminating indicators with insufficient data quality, correcting the imbalances among the different dimensions and subdimensions, and consulting members of the ISWG, the resulting list contained 140 indicators.
- **These 140 indicators provide a thorough overview of (almost) all relevant aspects of SIWB and form the comprehensive dashboard.**

A detailed account of the various phases and the indicator selection process undertaken in Phases 1-3 can be found in Annex 3. In addition to reviewing existing indicators, we also solicited suggestions for new indicators or concepts not currently included in the monitoring frameworks under consideration. While some of these suggestions were incorporated, others were set aside due to the unavailability of suitable indicators or insufficient data. The gaps in indicator coverage identified during this process are documented in Annex 6.

The 140-indicator dashboard is important for the comprehensive assessment and monitoring of different aspects of wellbeing over time. In today's complex and interconnected world, policies and interventions have far-reaching and often long-run effects on various aspects of wellbeing. By establishing a comprehensive monitoring framework, there is the potential to streamline and simplify monitoring processes by consolidating various tools and approaches into a single framework, maximizing positive outcomes across a wide range of policy domains.

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[10] Annex 2 provides more details of the criteria used in this process.

[11] By overlaps we considered identical indicators from different sources, or indicators that are conceptually measuring the same phenomenon by have minor methodological differences.

Table 2. Summary of the selection criteria through phases

Phase	Criteria	Indicators
Phase 0: **COLLECTION OF RELEVANT INDICATORS** **ELIMINATING DUPLICATES**	Relevance Accuracy Easy monitoring Use in key EC monitoring frameworks	1116/466
Phase 1: **FIRST PRIORITIZATION**	Policy relevance Accuracy Credibility Metadata	231
Phase 2: **SECOND PRIORITISATION** **ASSESSMENT OF INDICATORS**	Policy relevance Data availability and properties Timeliness Frequency	153
Phase 3: **CONSULTATIONS**	Policy relevance Balancing subdimensions	140

4 The summary dashboard and synthetic indices

There is a wide range of ways in which indicators and evidence, in broad terms, can shape policy: from influencing public debate on strategic priorities and emergent issues, to being used in studies commissioned by government agencies to evaluate the impact of specific policy programmes. While the comprehensive dashboard may be suitable for the detailed monitoring and evaluation of wellbeing aspects, there is also a need for a smaller dashboard, with a limited number of indicators. These indicators are not considered superior to other indicators from the comprehensive dashboard but aim to provide a summary of the overall situation or status of the key dimensions being measured. This can facilitate the communication between policy makers and the general public, and agenda setting.

To work towards the choice of indicators for the summary dashboard, we have conducted further analyses of the 140 indicators from the comprehensive dashboard[12]:

- The statistical analysis was based on the correlation between the indicators[13] within the same dimension, or subdimension when the dimension was too large and heterogeneous, and principal component analysis. We have identified the indicators that capture the most variation from the underlying set and looked at correlations among indicators to avoid redundancies.
- In cases where the statistical analysis did not result in a clear guidance for the choice of indicators, we have relied on additional criteria: policy importance (as stated in the prioritization exercise) as well as data quality and coverage. Therefore, if the choice had to be made between two indicators from the same dimension and the analysis was not enough to make a choice, the one that got more support in the ISWG prioritization exercise and/or has better data coverage (timeliness, variation, or availability for global comparison or regional disaggregation) was considered[14].
- We aimed to keep at least one representative per subdimension (with exceptions). This process has resulted in a list of 67 indicators that were subsequently discussed in the inter-service working group. The discussions and further exchanges have resulted in a candidate list of 50 indicators across the six SIWB components (see Figure 2 for their distribution across components, and Annex 4 for their full list). With these indicators, we cover 41 out of the 58 sub-dimensions from the comprehensive dashboard.

Given the multidimensionality of the SIWB framework and the phenomenon itself, it is not surprising that it proved to be difficult to arrive at a list of just a handful of indicators. Selecting fewer than 50 indicators would risk overlooking critical aspects of wellbeing and would fail to capture the full complexity and interconnectedness of the various dimensions and policy areas involved. To overcome this challenge and facilitate high-level political communication, we propose **synthetic measures (composite indices)** that allow for the simplification of complex data sets by combining multiple inter-related indicators into a single measure. Furthermore, various aspects of wellbeing, societal resilience, natural environment, social inequality, etc., often require to be considered together in order to best capture the phenomenon. This can make it easier for decision-

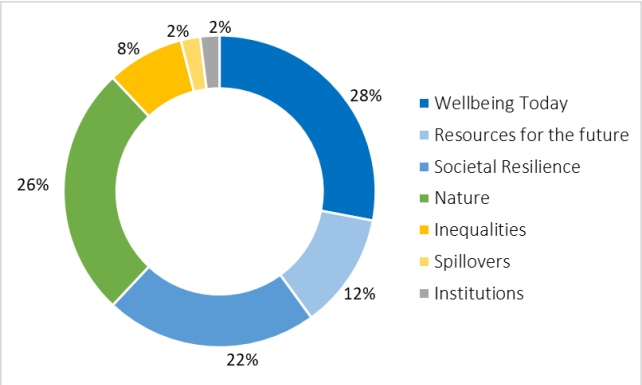
[12] The complete list of 140 indicators is shown in Annex 5.

[13] Annex 7 provides the detailed correlation analysis, with the correlation matrices for the components and dimensions.

[14] It is important to note that statistics cannot provide a silver bullet for the choice of a small number of optimal indicators and the process needs to be complemented by theoretical and practical considerations of researchers and policy makers. This represents one of the possible caveats of the selection process.

makers to understand and interpret the data. We focus the analysis based on the synthetic measures on the set of 50 indicators, as including too many indicators can make the index difficult to interpret and use, and eventually provide little extra value added to the analysis.

Figure 2. Distribution of indicators per component of SIWB in the streamlined dashboard



Source: authors' calculation.

This paper uses the synthetic indices for a high-level assessment of the situation when it comes to the main components of wellbeing, which can be then "opened up", for a more in-depth understanding of what factors (indicators) drive overall wellbeing or its components. While other methodologies are being explored, here we adopt the methodology applied to compute the synthetic indices for the Resilience Dashboards[15], which has important advantages[16].

To facilitate the interpretation and communication of the indicators, we present dashboards with a colour scheme for the underlying indicators and the corresponding summary synthetic measures. For each indicator, a scale of five colours indicates each country's situation in a given year (2022 or the latest available) within a reference distribution, which is composed by the collection of values of that indicator for all Member States and all years in the reference period 2011-2022 (see Figure 3).

Figure 3. Colour scheme of the proposed methodology

Bottom 12.5%	12.5% - 37.5%	37.5% - 62.5%	62.5% - 87.5%	Top 12.5%

An important feature of this approach is that it allows the assessment of a country's situation over time and relative to all other EU countries, rather than providing information only within a given year. For reasons of consistency and time analysis, missing values have been imputed so that every country has values for all indicators and all years, therefore having a balanced composition of the synthetic indices at all times[17].

[15] Annex 8 describes the detailed methodology adopted and also touches on the drawbacks of using synthetic indices.

[16] First, a multi-year reference period (instead of a single-year one) enables a comparison of the index values over time: a higher value indicates a better situation. Second, for the same reason, it is possible to construct indices both for a "proper calendar year" (e.g. 2022 data) or for the "latest available year" (mix from various years). Third, the fixed reference period (instead of a 'rolling period', e.g. the past 10 years) implies that the current index will only change in the future if backward data revisions occur within the reference period. See European Commission (2021).

[17] For three indicators, this mean to use only their latest (2022 or 2021-22) values: "at least basic digital skills" (there was a methodological change in 2021), "projected old-age dependency ratio" and the International Spillover Index.

Box 1: The dashboard methodology.

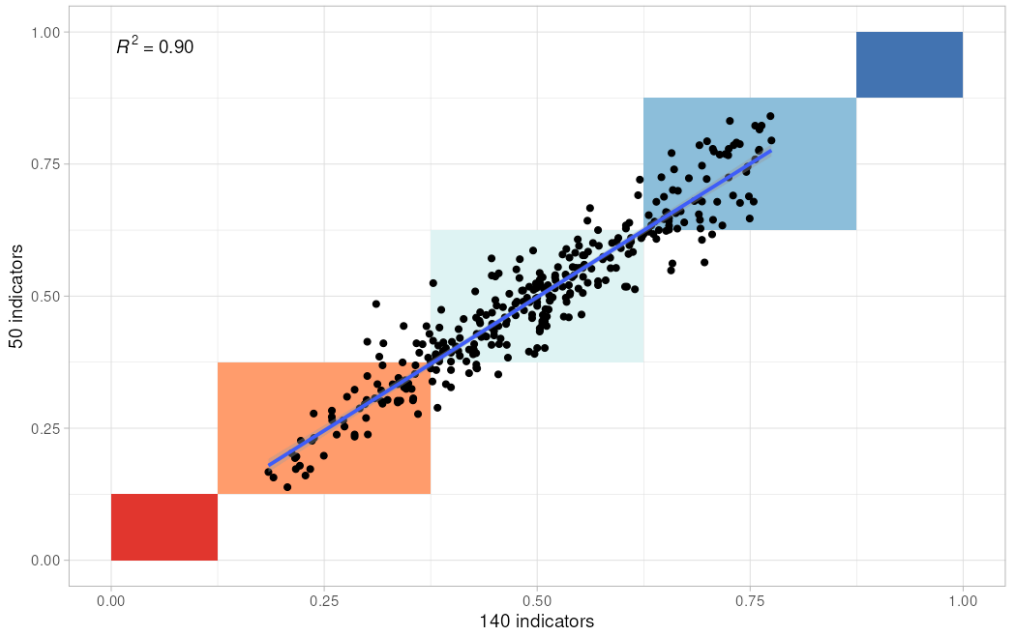
The country rankings are relative and based on a scale of five colours. The colours represent a country's position within the overall distribution of indicator values across all EU Member States and years (2011-2022). To interpret the colours, think of it like a percentile ranking. Dark blue indicates a country's situation is in the top 12.5% of the overall distribution, while dark orange indicates it's in the bottom 12.5%. Blue and orange represent the next 25% on either side, and light blue indicates a middle-of-the-pack situation (37.5^{th} to 62.5^{th} percentile).

A country's position in a given year is assessed against the entire distribution of values across 2011-2022. This means that a (dark) blue colour indicates both that a country's situation compares relatively well to other countries in a given year and that it has improved over time; and vice versa for (dark) orange cells.

The component-level and overall synthetic indices are defined as the median value of these percentile positions among all of the indicator values of a given country and year. For comparability, we have introduced similar percentile versions of GDP per capita.

To further motivate the use of a limited set of representative indicators in the summary version of the dashboard, Figure 4 plots all the component level synthetic measures based on the 50 versus 140 indicators. The two versions are strongly correlated (see Annex 9 for more details), indicating that the smaller subset conveys an overall picture similar to the one by the full set. The comprehensive set of indicators remains still important for a more detailed assessment and analysis.

Figure 4. Relationship between the SIWB synthetic indices based on all indicators (140) and the selected 50 indicators, all Member States and all years



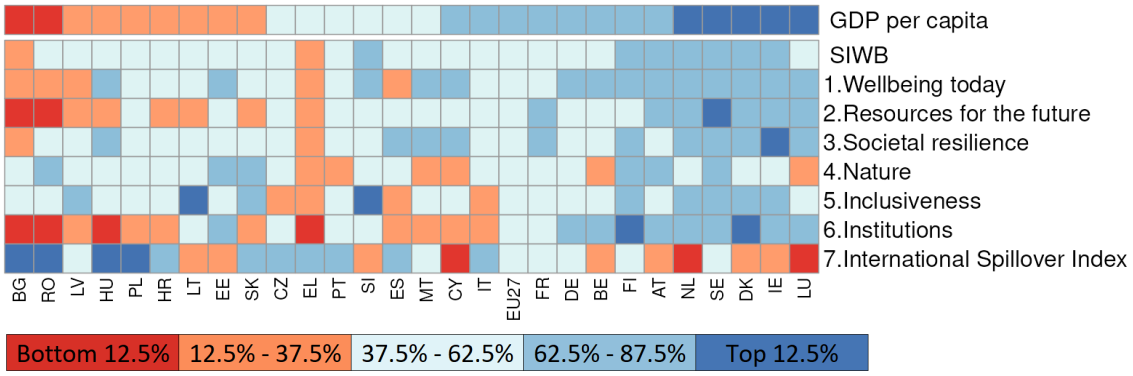
Note: The graph depicts the relationship between the SIWB synthetic indices based on all indicators (140) and their counterparts calculated on the basis of selected 50 indicators. Each point refers to a specific Members State-year pair. *Source*: authors' calculation.

5 The state of sustainable and inclusive wellbeing across EU Member States in 2022

To illustrate the application of the proposed methodology and the power of the assembled indicator dashboard, we report overview and some specific visualisations, together with first pass readings from the indicator patterns. The analysis includes synthetic indices and indicators based on the streamlined dashboard of 50 indicators. The interpretations are preliminary and illustrative. Still, these results aim to already indicate the information content of the indicator set and synthetic measures.

The first dashboard (Figure 5) presents the colour-coded situation (based on the percentile position in the underlying reference distribution) for the overall SIWB synthetic indicator (SIWB), the component-level subsets, and GDP per capita[18].

Figure 5. Total and component level synthetic indices across Member States in 2022



Note: The dashboard shows the overall SIWB and component-level synthetic indices, and the GDP per capita percentile positions in the 2011-22 reference distribution (see Box 1 for their definition). The countries are ordered by GDP per capita.
Source: authors' calculation.

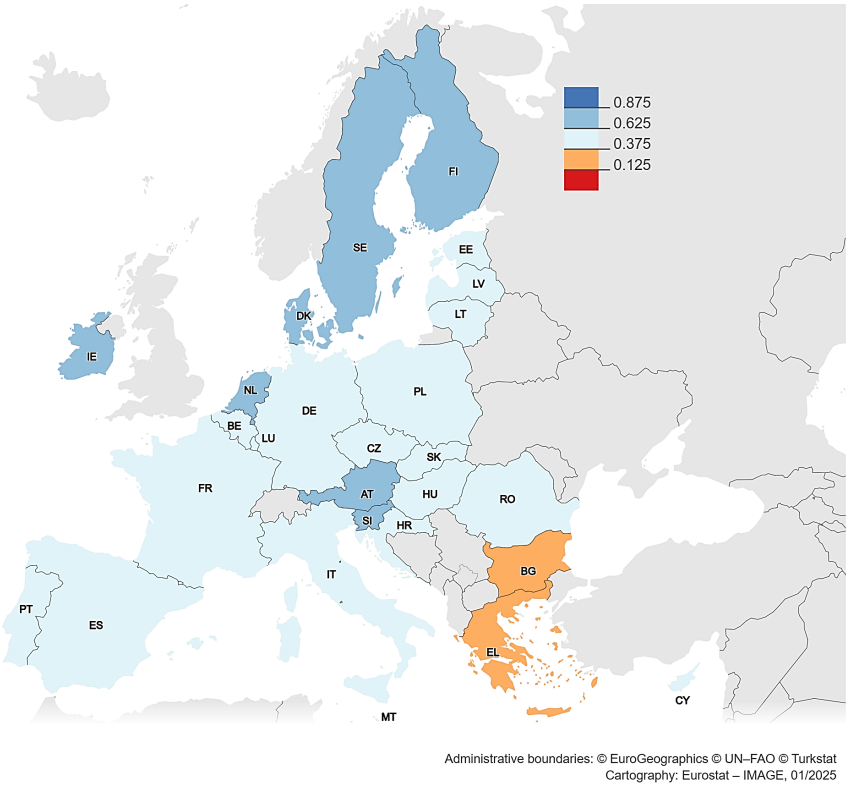
The state of wellbeing and its components in the European Union varies across Member States which can be attributed to a range of factors such as economic conditions, social policies, healthcare systems, and cultural norms. Additionally, disparities in wellbeing exist between different regions and socioeconomic groups, highlighting the need for targeted interventions to enhance cohesion and address inequalities.

The countries with the highest overall wellbeing (shown more clearly on Figure 7), including its different aspects and facets, are Sweden and Finland, while Denmark, Ireland, the Netherlands, and Austria are characterized by above average situation in all areas except *spillovers*, where their situation is near the bottom of the distribution, and in some components (*nature*, *inclusiveness and societal resilience*, varying by country) where they remain in the middle of the distribution. At the same time, these are the countries with the highest GDP per capita. We deliberately include values of GDP per capita in the dashboard (in its percentile version, see Box 1 for its definition) to see how sustainable and inclusive wellbeing and its components relate to economic prosperity. As visible in Figures 5, 6 and 7, the two seem to correlate with each other, but there are notable exceptions. Estonia, for instance, strongly stands out, with its above average overall wellbeing, contrasted by

[18] Real GDP expressed in chain linked volumes (2010), euro per capita.

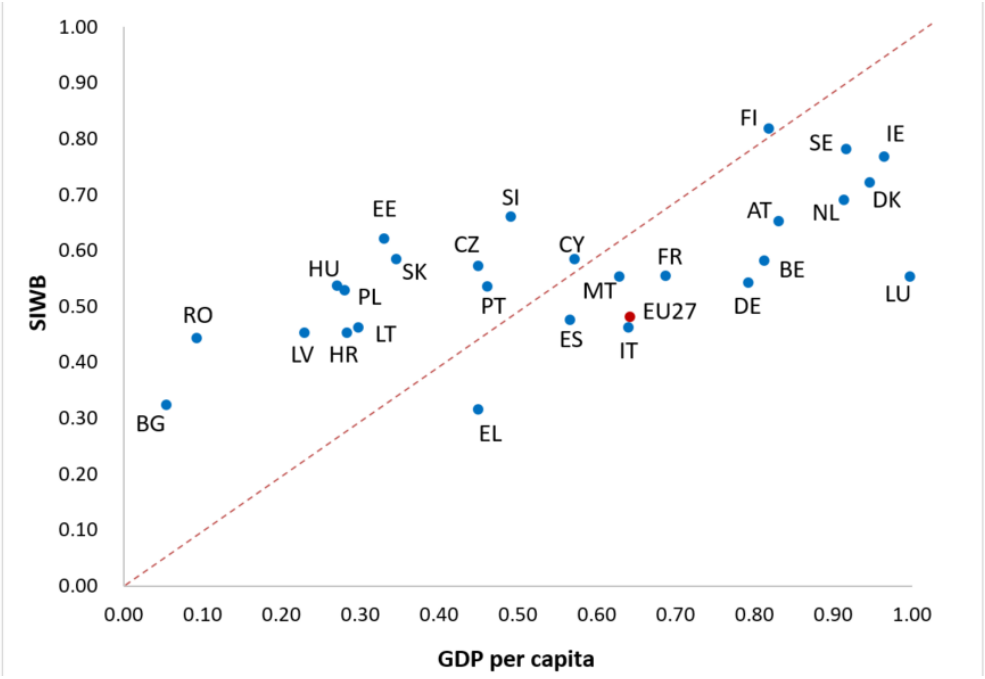
below average GDP per capita, as one example of the decoupling of the two phenomena. Romania, Bulgaria, Hungary, Poland, and Slovakia also have a substantially higher SIWB index than its GDP per capita percentile position.

Figure 6. The sustainable and inclusive wellbeing synthetic index across EU countries in 2022



Source: authors' calculation.

Figure 7. Relationship between the overall SIWB synthetic index and GDP per capita (2022)



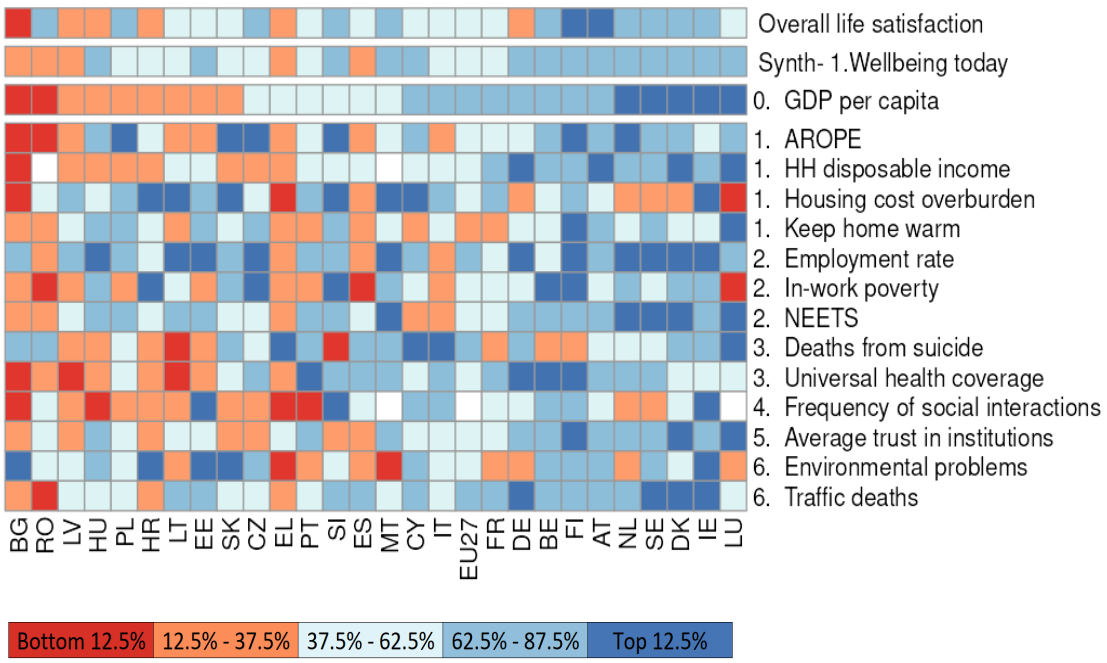
Source: authors' calculations.

Figure 5 further reveals that countries with a weaker economic situation, measured by GDP per capita, often have a below-average level of *resources for the future* and *institutional quality* (BG, RO, LV, HU, HR, LT, SK). For some of these countries, the level of wellbeing today is nevertheless around the median (PL, HR, LT, SK) or even above the median level (HU, EE). Southern and Eastern countries (EL, ES, BG, RO) show a weaker situation in this area compared to the distribution. Bulgaria and Greece stand out as the weakest overall and across most components.

5.1 Wellbeing today

The *wellbeing today* synthetic index sets out to capture different aspects of current wellbeing (objective and self-reported) covering e.g. living conditions, employment and health in a single figure. *Average life satisfaction* is not included in the composite index due to its overlap with the whole component and its subjective nature[19], but shown separately for the comparison. Approximately half of Member States (14 out of 27) report a relatively strong situation (blue category), nine Member States score around the EU27 average, and five have a weak overall situation (BG, RO, LV, EL, ES).

Figure 8. Wellbeing today index and indicators across Member States in 2022



Note: The dashboard shows the percentile position of each Member State in the reference distribution (2011-2022) for wellbeing today. The numbers before the indicators refer to the underlying dimensions: 1. material living conditions and economic security, 2. productive and other main activity, 3. health, 4. leisure and social interactions, 5. governance and basic rights, 6. natural and living environment, and 7. overall experience of life. The last one, represented by the indicator 'overall life satisfaction' is not included in the synthetic index as it overlaps with the rest of the component. The countries are ordered by GDP per capita.
Source: authors' calculation.

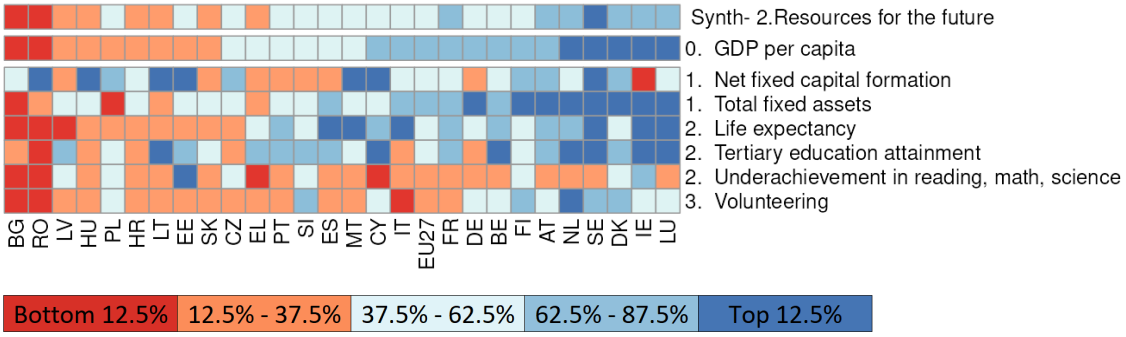
[19] The subjective indicators can be divided in three categories: subjective indicators of objective concepts, subjective indicators based on assessment and subjective indicators based on affect. Most of the subjective indicators in this dashboard measure objective concepts. The indicator excluded measures rather affect.

The *wellbeing today* component holds information from 13 indicators representing seven dimensions. The total index is influenced by the situation of the underlying dimensions and their indicators. The indicator with the strongest score (dark blue) for most countries is the *employment rate* (11 out of 27). This points to improvements over the period of time (2011-2022) visible also in the blue value for the EU. Similar is true for *universal health coverage* and number of *deaths from suicide*, but these indicators reveal much more heterogeneity across countries, with LT, LV, EE, HU and HR show a lower situation than the average in both areas of physical and mental health. Looking at individual countries, the highest values across *wellbeing today* indicators are recorded in Finland and Austria, which coincides with the highest values of *average life satisfaction* stated by the citizens of these countries. The lowest situation across most dimensions is recorded in BG, RO, LV, EL and ES.

5.2 Social and economic resources for future wellbeing

Social and economic resources for future wellbeing capture economic, human (health and education) and social capital. The indicators with the lowest situation across countries are *underachievement in math, reading, science* and the rate of *formal and informal volunteering*, that are below the 2011-2022 distribution medium range for (over) half of the EU countries. Indeed, the latest PISA results have shown that the underachievement rate has increased significantly in mathematics and reading, and more moderately in science, in most countries compared to the previous PISA 2018, in line with an overall declining performance of students, as also attested to by the orange colouring of EU27 value in the dashboard that signals a decrease overtime.

Figure 9. Social and economic resources for future wellbeing: synthetic index and indicators in 2022



Note: The dashboard shows the percentile position of each Member State in the reference distribution (2011-2022) for social and economic resources for future wellbeing. The numbers before the indicators refer to the underlying dimensions: 1. economic capital, 2. human capital, and 3. social capital. The countries are ordered by GDP per capita.
Source: authors' calculation.

Countries may have different levels of *social and economic resources for future wellbeing* across the different dimensions (Figure 9). While the situation in countries like Bulgaria and Romania is below the middle of the distribution in almost all aspects, except *net fixed capital formation*, some countries show more heterogeneity than others in this component[20]. Sweden, Luxembourg and the Netherlands have the strongest overall situation across the entire component, in particular the human capital indicators, with the exception of increasing student *underachievement in reading, math and science*. Recognizing variations within and across countries is essential for strategic

[20] The very low value of Ireland's net fixed capital formation is driven by a constantly increasing consumption of fixed capital and a volatile gross capital formation variable, due to the behaviour of a small number of large multinational corporations.

resource allocation to promote a balanced societal development and ensuring the future wellbeing through strengthening all its pillars across all European societies.

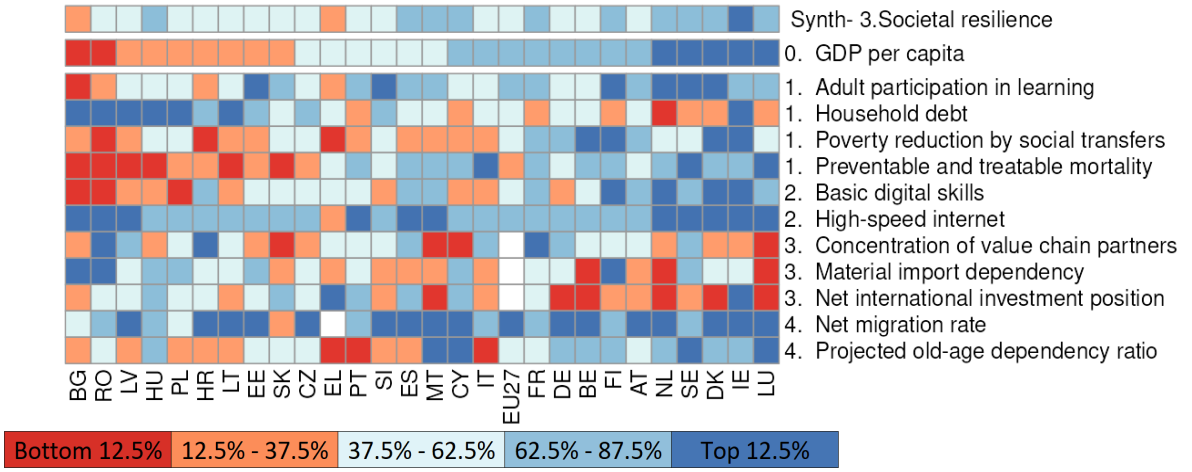
Resources for the future correlate highly with GDP per capita (85%), though one may need to look deeper as this component includes both stock- and flow-type indicators. From a convergence perspective, one may expect higher flows in countries with low GDP per capita. On the other hand, stock measures correlate strongly with income levels, and even investment in education and health may be linked to the level of national income through the amount of funds available for public spending. Resources for the future also correlate highly with current wellbeing, partly due to the similarity of indicators in the health and social connections dimensions, where it is often difficult to distinguish between factors pertaining only to current or only to resources for future wellbeing.

5.3 Resilience: societal challenges and sustainability transitions

The component of *Resilience: Societal challenges and sustainability transitions* encapsulates the social and economic, digital, geopolitical, and demographic dimensions. It is a highly heterogeneous component, with countries having strong and weak points simultaneously. This shows up in the low dispersion of the synthetic measures across countries.

As one of the most heterogeneous areas, the societal resilience dashboard paints a mixed picture (Figure 10). Ireland has the best overall situation, and in most of the indicators captured. With countries such as DK, SE and FI showing a strong situation in this component, countries such as BG and EL may struggle to catch up, especially in the socio-economic dimension.

Figure 10. Societal resilience index and indicators across Member States in 2022



Note: The dashboard shows the percentile position of each Member State in the reference distribution (2011-2022) for resilience: societal challenges and sustainability transitions. The numbers before the indicators refer to the underlying dimensions: 1. social and economic resilience, 2. digitalisation and technological change, 3. geopolitical resilience, and 4. demography and urbanisation. The countries are ordered by GDP per capita.
Source: authors' calculation.

In the dimension of social and economic resilience, one indicator that stands out by the number of countries that place below the middle of the distribution is *preventable and standardized treatable mortality*, which points to heterogeneity in the effectiveness of the healthcare system in many Member States, but also to a deterioration in this indicator caused by the Covid-19 pandemic. Poverty reduction by social transfers also shows a high level of heterogeneity, with countries with lower GDP per capital usually exhibit a worse situation, but there are examples of higher-income

countries where the situation is below the middle of the distribution, such as IT, CY, PT, MT, ES, EL. When it comes to preparedness for the digital transition, most countries have achieved a high level of *high-speed internet coverage* but have notable disparities in terms of *basic digital skills*.

Next, around half of the EU countries have warning signs in the geopolitical dimension, with unfavourable *net international investment positions* and a relatively high *material import dependency*[21]. While this is especially the case for smaller countries such as Malta and Luxembourg, as well as western European countries (NL, BE, DE, DK), Eastern European countries record a less troublesome picture in geopolitical aspects.

Finally, when it comes to the demography dimension, in the context of an aging European society, the *projected old age dependency ratio* varies significantly across Member States, with countries like Italy, Portugal and Greece most affected by the aging of the population. This is important because the demographic shifts in aging societies will have profound implications for various sectors including healthcare, labour force participation, and social welfare systems, requiring proactive policies and strategies to address the challenges posed by an increasingly elderly population, as well as implications for future generations

Ultimately, it is evident that different Member States, and at times entire blocs, face very different societal challenges and have varying levels of capacities to confront future shocks and transitions that could impact the welfare of their populations. This underscores the complex and multifaceted nature of societal resilience wherein different countries face diverse challenges and strengths across various dimensions. It highlights the need for targeted and tailored strategies to bolster resilience in the face of geopolitical, economic, and social pressures, recognizing that one-size-fits-all approaches are insufficient in addressing the diverse needs and circumstances of EU member states.

5.4 Nature and planetary boundaries

The *Nature and planetary boundaries* component (shown on Figure 11) aims to capture four broad dimensions crucial to planetary sustainability: ecosystems and biodiversity, climate change, adaptation and sustainable use of resources, and green economy and policies.

When it comes to safeguarding ecosystems, countries such as Finland, Sweden, and Slovakia do particularly well with a few exceptions, while countries like Malta, the Netherlands, and Portugal show the most weaknesses in this area.

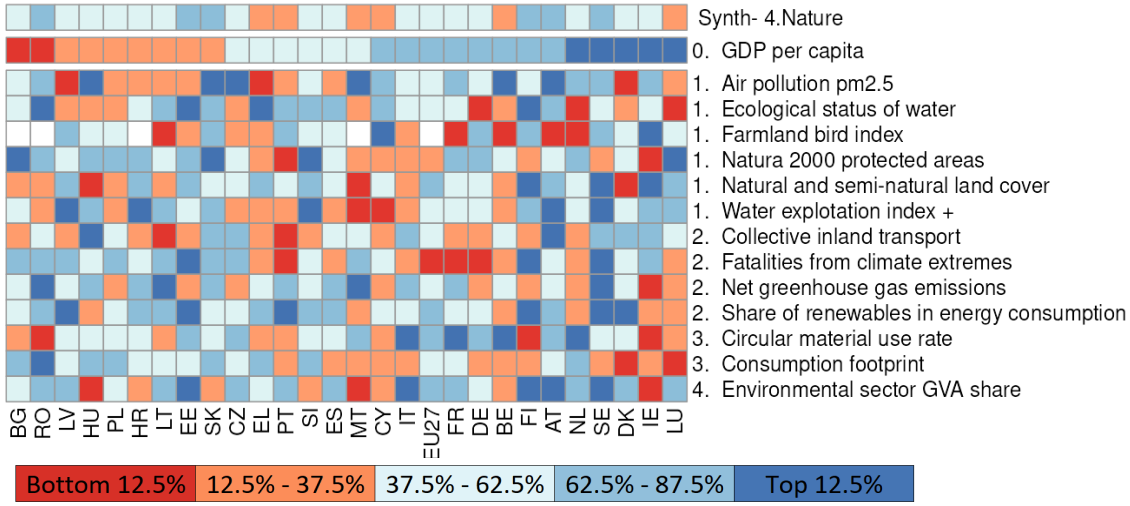
When it comes to climate change and adaptation, there is an increasing *share of renewables in energy consumption* in most countries, reflected also in the above distribution median value for the EU27, and *net greenhouse gas emissions* also have an improving trend. *Fatalities from climate extremes* are the highest in Portugal, Germany, France, followed by Belgium and southern countries (IT, EL, ES) that are ever more frequently hit by heatwaves, floods and other adverse climate events. Central and Northern European countries are less affected.

In the dimension of sustainable use of resources, countries show a diverse picture in terms of the two indicators captured. The consumption footprint in most cases correlates negatively with GDP per capita, while for the circular material use the picture is mixed for both higher and lower income

[21] Please note that the EU value would mask intra-EU dependencies as it would show only import dependency to non-EU countries. While we are investigating whether the country level indicators should and could reflect only extra-EU dependencies, we are marking this indicator for the EU as not available. For similar reasons, the concentration of value chain partners and the net international investment position are also left blank for the EU.

countries. While some countries may have a higher an average *circular use of resources,* the overall *consumption footprint* may still be towards the distribution bottom, such as in the case of Denmark, Italy and Belgium.

Figure 11. Nature synthetic index and indicators across Member States in 2022



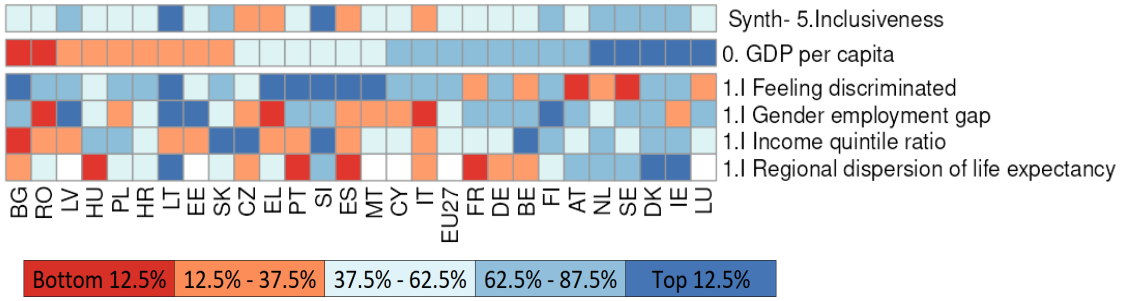
Note: The dashboard shows the percentile position of each Member State in the reference distribution (2011-2022) for nature. The numbers before the indicators refer to the underlying dimensions: 1. safeguarding ecosystems and biodiversity, 2. climate change mitigation and adaptation, 3. sustainable use of resources, and 4. green economy and policies. The countries are ordered by GDP per capita.
Source: authors' calculation.

5.5 Inclusiveness

The component of *inclusiveness* looks at inequalities (vertical, horizontal and regional) and spillovers. Figure 12 shows the synthetic indictor for *inequalities* while Figure 13 shows the position of Member States for the *international spillovers* (i.e. international spillover score). The reason for showing these two dimensions separately is the very different nature of the underlying indicators (in particular, of the international spillover score).

When it comes to vertical inequalities, namely *inequalities in the level of income*, many Southern and Eastern countries tend to exhibit the worst situation, while the situation in Belgium, Czechia, Slovenia and Slovakia is among the best of all Member States. Many Southern countries record significant regional disparities in life expectancy. On the other hand, citizens of Southern and Eastern countries feel being discriminated less than those of Western Europe.

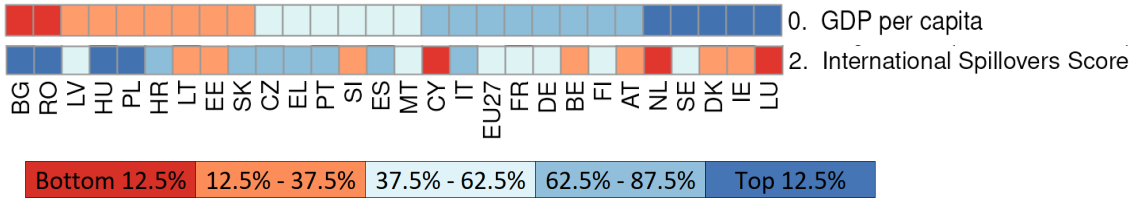
Figure 12. Inequality indicators across Member States in 2022



Note: The dashboard shows the percentile position of each Member State in the reference distribution (2011-2022) for inequality (the inclusiveness component without spillovers). The countries are ordered by GDP per capita.
Source: authors' calculation.

When it comes to international spillovers, the Spillover Index[22] looks at three aspects: environmental and social impacts embodied into trade, economy and finance, and security. Cyprus, Luxembourg and the Netherlands seem to have the highest overall spillover index, while Bulgaria, Romania, Hungary and Poland have the lowest. Countries like Slovenia and Ireland have a good situation in terms of within country inequalities but have higher international spillovers.

Figure 13. International spillovers across Member States in 2022



Note: The dashboard shows the percentile position of each Member State in the reference distribution (2011-2022) for international spillovers. The countries are ordered by GDP per capita.
Source: authors' calculation.

It is important to consider these spillovers because actions taken by one country can have far-reaching effects on other nations and the global community as a whole. For example, economic policies in one country can impact trade and financial markets globally, while environmental policies can have transboundary effects on air and water quality. Understanding and addressing international spillovers is crucial for promoting global stability, cooperation, and sustainable development, as well as for mitigating potential negative impacts on other countries and the international community. Failure to consider international spillovers can lead to unintended consequences and hinder efforts to address global challenges effectively.

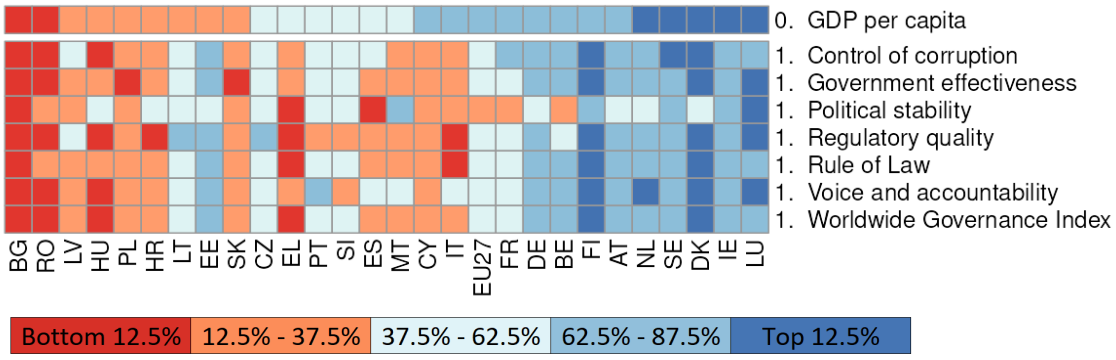
5.6 Institutional quality

For measuring the level of *institutional quality*, we consider the World Bank's Worldwide Governance Indicators (WGI) and create a Worldwide Governance Index as the average of the six components of the original framework. It considers the process by which governments are selected, monitored, and replaced (voice and accountability, political stability, and absence of violence/terrorism), the capacity

[22] While not yet available, we plan to consider also the environmental footprint of EU imports indicator for the spillover dimension.

of the government to effectively formulate and implement sound policies (government effectiveness, regulatory quality), and the respect of citizens and the state for the institutions that govern economic and social interactions among them (rule of law, control of corruption). Figure 14 also shows the percentile positions of the six underlying sub-indicators of the Worldwide Governance Indicators. The indicators are in most cases highly correlated, this is why we kept only their average in the set of 50 indicators.

Figure 14. Institutional quality indicators across Member States in 2022



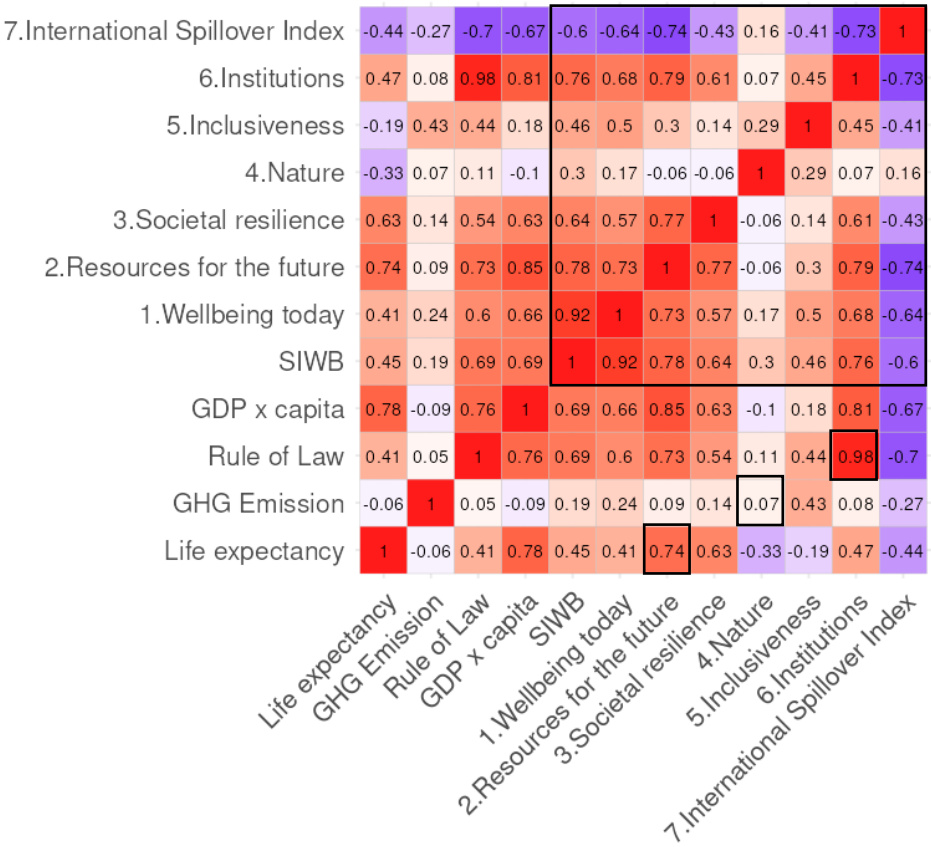
Note: The dashboard shows the percentile position of each Member State in the reference distribution (2011-2022) for the average of the six indicators in the Worldwide Governance Indicators dataset. It also shows the percentile positions of the six underlying indicators. The countries are ordered by GDP per capita.
Source: authors' calculation.

The countries doing the best in terms of *institutional quality* are Denmark and Finland, followed by Luxembourg, Sweden, the Netherlands, and Ireland, while those whose situation is below the distribution average include countries in Southern and Eastern Europe. There seems to be a strong association between institutional quality and economic development, proxied by GDP per capita (a correlation of 0.81). The two starkest exceptions are Italy and Cyprus that, despite their higher-than-average income, show weaknesses in most or all aspects of institutional quality. Though the analysis of this relationship has a long-standing and complex literature, this insight points to the widely held view that countries with well-functioning institutions are more likely to experience higher levels of economic development and overall societal wellbeing.

6 Relationship among the components and links to GDP plus 3

The complex and interconnected nature of the components of SIWB necessitates a holistic approach that considers the ways in which they relate to each other. By exploring the interplay between various elements of wellbeing, policymakers and stakeholders can better address the trade-offs, synergies, and potential conflicts that arise, leading to more balanced and sustainable strategies for enhancing overall societal welfare.

Figure 15. Correlations among the components, GDP per capita and GDP+3 indicators in 2022, scenario "Better Life"



Source: authors' calculation.

As visible from Figure 15, and previously noted, wellbeing today, resources for the future, societal resilience, and GDP per capita correlate positively with each other. This is not a surprise given the presence of several economic (or related) indicators in these dimensions, and the fact that the level of economic development does affect many aspects of wellbeing and the ability to invest in resources for the future. At the same time, we have tested and ensured that these relationships hold over time, and that the trend of these components is also common.

The status of, i.e. pressures on, nature correlates negatively but insignificantly with GDP per capita. Inclusiveness doesn't correlate much with GDP per capita, and only modestly with some of the other dimensions, showing that higher income levels do not necessarily mean a more equal society. Institutional quality, however, correlates very strongly with GDP per capita, current wellbeing, and social and economic resources for the future.

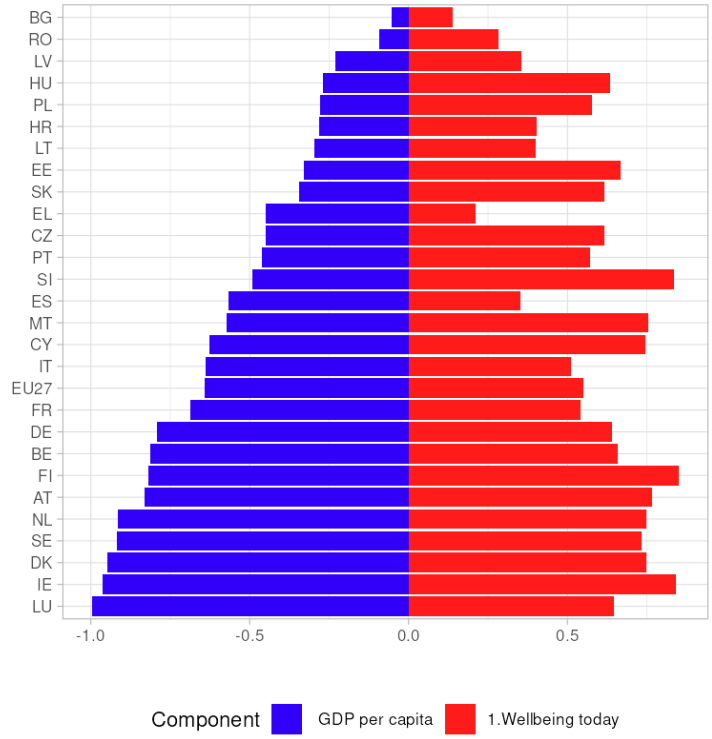
To ensure consistency, we compared the component level synthetic indices with the indicators chose by the DG RTD-funded study (Charveriat et al., 2024), that aims to identify three possible indicators from the social, environmental, and institutional domains to complement GDP. We compare SIWB areas to the indicators specified in one of the three scenarios from the study "Better Life" that proposes the following three indicators*: rule of law, GHG emissions,* and *life expectancy*[23]. We find that their institutional indicator correlates 97% with our synthetic measure for institutional quality, which is expected given that our institutional measure captures several aspects including *rule of law,* and that these aspects are highly correlated with each other. The chosen indicator for the environment (*GHG emissions*) correlates only 26% with our nature component. This is not very high, and is not surprising given that the nature component includes 13 indicators across four very heterogeneous dimensions. As Annex 10 reveals, the other GDP+3 candidate for the environment (*material footprint*) correlates even less with our nature component. It illustrates the difficulty to capture the status of the environment and planetary boundaries with a small number of indicators. Finally, the chosen social indicator (*life expectancy*) correlates 74% with the dimension societal and economic resources for the future that in the SIWB framework captures this aspect. It is also correlated with, though to a smaller degree, the overall SIWB index, wellbeing today, societal resilience, and institutions.

[23] For comparison with the other two scenarios "Leaving no one behind" and "Make poverty history", see Annex 10.

7 Tensions and trade-offs: selected comparisons across components

While economic development can contribute to improved living standards and access to resources, it is well understood that it does not guarantee overall wellbeing for all members of society. The pursuit of economic goals can often come at the expense of environmental sustainability and social equity, as it does not take into account the negative externalities of production, such as pollution and resource depletion, nor the non-material or distributional aspects of wellbeing. Figure 16 indicates that, while there is correlation between *GDP per capita* and *wellbeing today*, there are notable exceptions. Countries like Cyprus, Malta, Slovenia, Czechia, Slovakia, Estonia, and Hungary stand out with higher-than-average current wellbeing, compared to significantly lower levels of *GDP per capita*. Greece and Spain, on the other hand, stand out with very low levels of *wellbeing today*, despite being in the middle of the GDP per capita distribution. This attests to the fact that a broader range of social, cultural, and policy factors may significantly influence the overall wellbeing of a society, transcending purely economic measures.

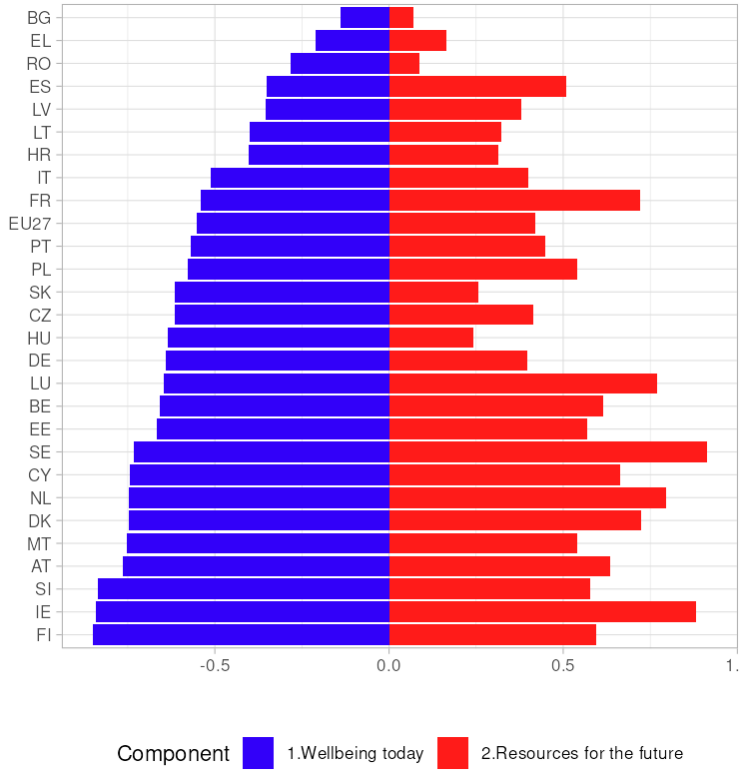
Figure 16. Comparison of GDP per capita and Wellbeing today in 2022



Source: authors' calculation.

Tensions can arise among the various categories of sustainable and inclusive wellbeing due to competing priorities and trade-offs. For instance, there may be tensions between addressing immediate needs for current wellbeing, such as poverty alleviation and healthcare, and investing in certain types of societal resources for future wellbeing, such as infrastructure, and research and development. Investing in education, healthcare or community strength may have long-term benefits for economic growth, resilience and social cohesion, but can be subject to severe short-term budget constraints. Balancing short-term needs with long-term investments can be thus a challenge. As seen from Figure 17, many countries have lower levels of societal resources for future wellbeing in comparison to their current wellbeing, which may jeopardize the wellbeing of their future generations.

Figure 17. Comparison of wellbeing today and societal resources for the future in 2022

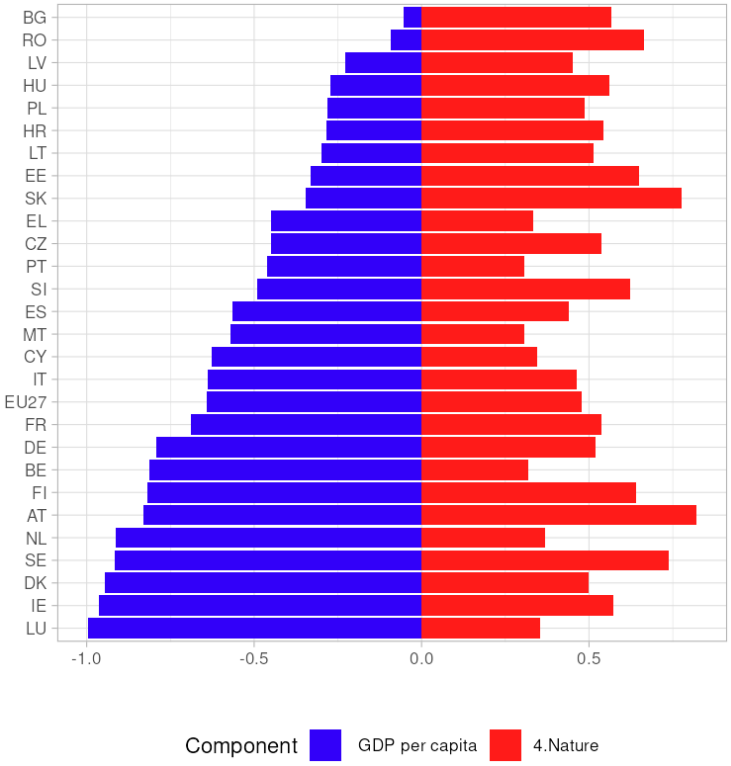


Source: authors' calculation.

When it comes to nature, there can be trade-offs with the level of economic activity, if production is based on an unsustainable, pollutant and linear economic model. Economically advanced countries often rely on a linear economy and high energy consumption, leading to increased pollution, habitat destruction, and resource depletion. This puts a strain on natural ecosystems, leading to biodiversity loss, climate change, an unhealthy population, and environmental degradation. These effects often do not stop at the borders, or may even have a bigger effect on other countries.

As shown on Figure 18, the state of nature can be vastly different from the level of GDP per capita. There are nevertheless countries with a high level of per capita GDP and a high nature index, like Sweden, Austria and Finland, showing that a competitive economy and nature can go hand in hand.

Figure 18. Comparison of Nature and GDP per capita in 2022



Source: authors' calculation.

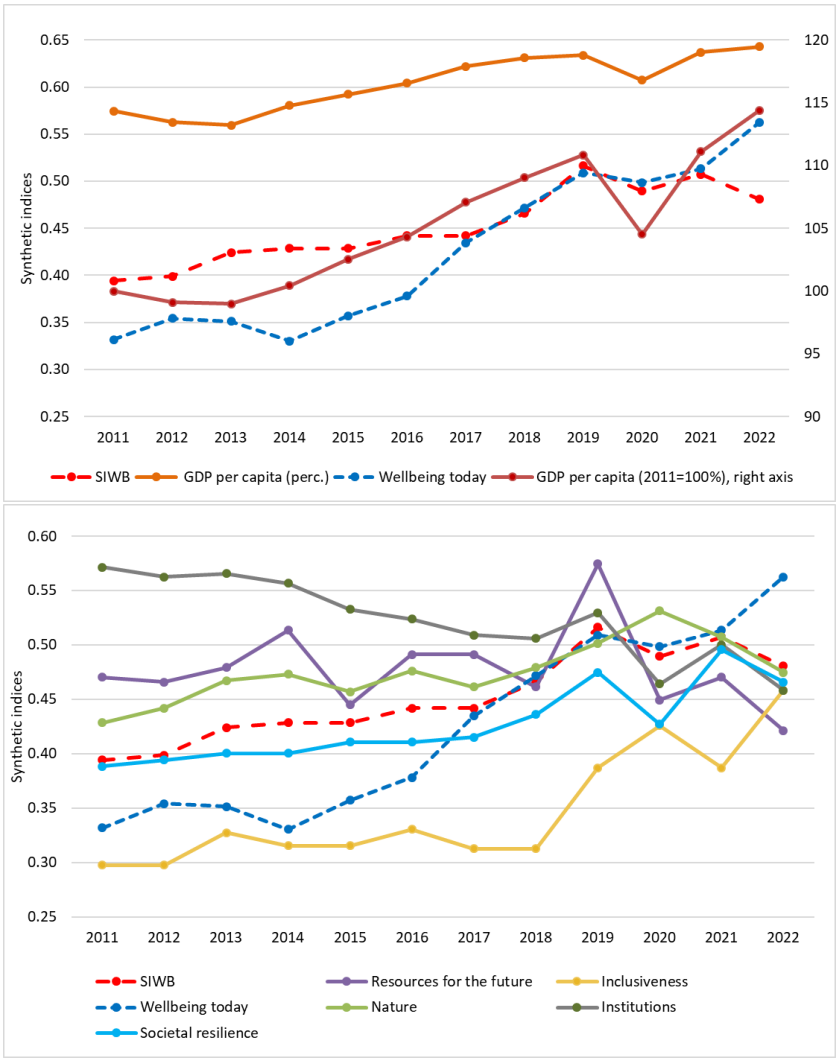
The potential tensions and trade-offs are not limited to those mentioned and can manifest in many different ways. By recognizing and addressing these tensions, the SIWB dashboard can help policymakers and stakeholders to strive towards a balanced and sustainable approach that promotes the overall wellbeing of society, both in the present and for future generations.

8 Evolution of wellbeing and its components over time

An important feature of the methodology for the synthetic indices is that the values are directly comparable across countries and over time. For example, a better percentile value of an indicator (or synthetic index) in a given country and year than in any other country in any other year indicates a better situation. This section thus presents a first analysis of the evolution of the EU's synthetic indices over time. As explained in Section 4 and Box 1 in more details, the component-level and overall synthetic indices are defined as the median value of the percentile positions among all of the corresponding indicator values of a given country and year.

Overall, all facets of sustainable and inclusive wellbeing recorded an upward trend since 2011. Figure 19 shows the trends of SIWB, each of its components and the GDP per capita over the observed period. For easier access, the top panel shows only the overall SIWB index, the wellbeing today index, the percentile positions of the EU's GDP per capita, and a 'raw' version of GDP per capita as well (normalised as 2011=100%).

Figure 19. Evolution of the SIWB index and its components over time, EU 27, 2011-2022

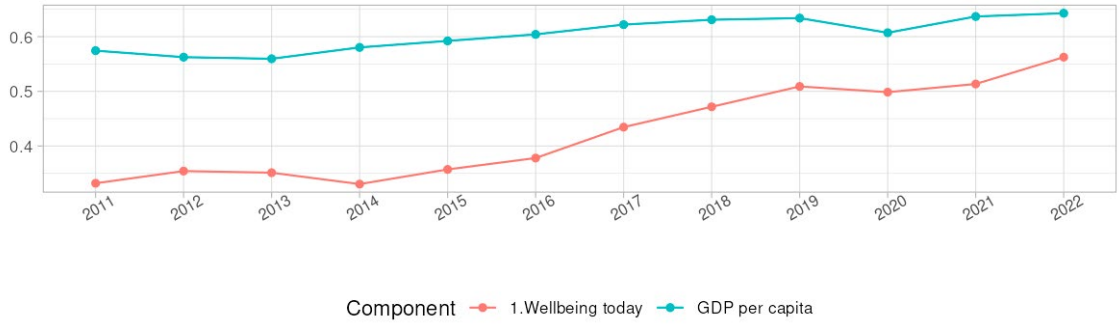


Source: authors' calculation. Spillovers are not shown as the indicator has data only for the latest year.

The positive trend is reflected in all the components of SIWB, except institutional quality. It is however noticeable that *wellbeing today* and *inclusiveness* recorded a significant increase between

2011 and 2019, flattening out in 2020, and picking up again in 2022. The following analysis of each component will reveal more on the underlying details of these particular trends. The trend patterns of all the individual underlying indicators are available in Annex 11.

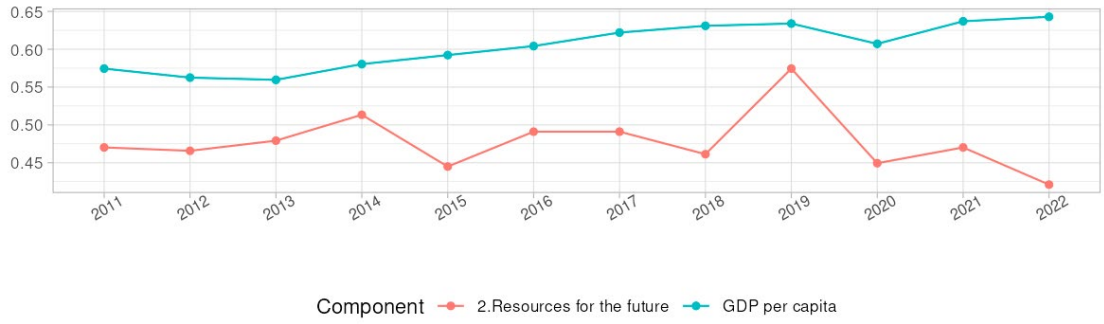
Figure 20. Evolution of the wellbeing today synthetic index over time, EU 27, 2011-2022



Source: authors' calculation.

Since 2011, current wellbeing in the EU has been steadily increasing, while its trend started to flatten in 2020 and 2021, picking up again in 2022 (Figure 20). It follows a similar trend to the one of GDP per capita, with both record a drop in 2020, which in the case of *wellbeing today* indeed seems to be linked to the economic aspects, driven primarily by a drop in the employment rate and increase of NEETS. This drop was gradually offset by 2022 when we see the upwards trajectory of the composite continued. It is also notable that *wellbeing today* in Europe has improved more in percentile terms than GDP and continues to improve even when GDP per capita continues to drag. The current wellbeing of European people may be thus linked to rising living standards, but it has a strong potential to grow beyond the economic factors that only represent one of the several aspects of current wellbeing.

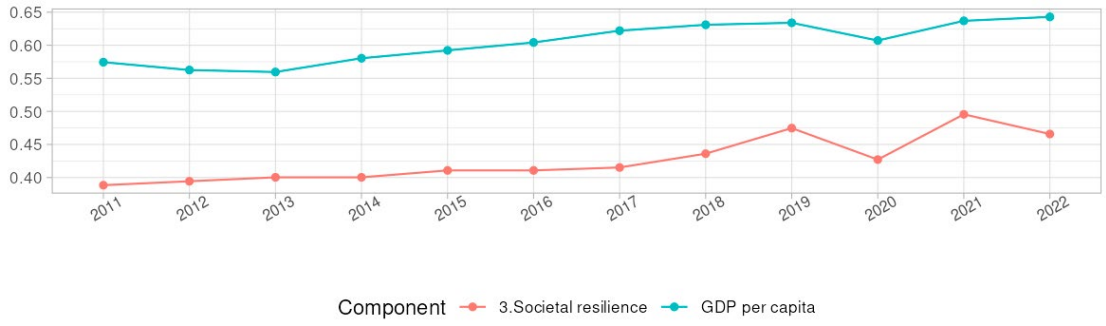
Figure 21. Evolution of the *resources for the future* synthetic index over time, EU 27, 2011-2022



Source: authors' calculation.

As visible from Figure 21, societal resources for the future recorded an upward trend until 2014 when there was a decline, mostly driven by the high *underachievement rate in reading, math, and science* in the 2015 PISA test, which was further exacerbated in 2022. After a spike in 2019 driven by improvements in *net capital formation and life expectancy*, from 2020 both recorded a decline. In 2022 a decline of *formal and informal volunteering* rate caused a further drop, and a decoupling of societal resources from the GDP per capita trend. While *total fixed assets* and *tertiary education* were improving over the entire period, these did not offset the previously mentioned developments.

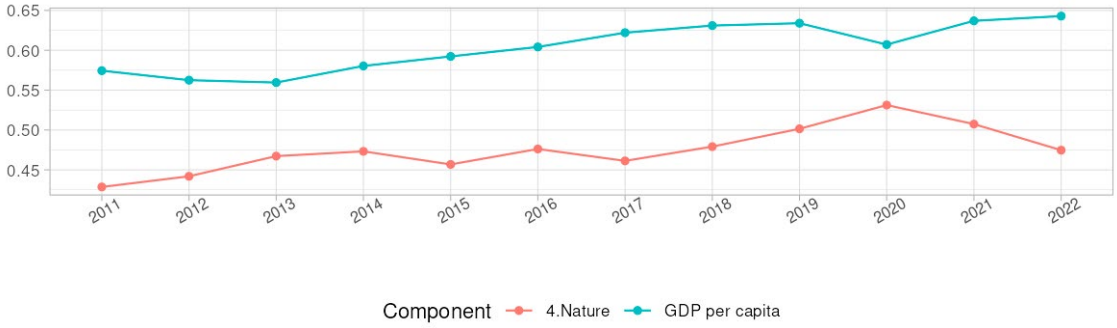
Figure 22. Evolution of the *societal resilience* synthetic index over time, EU 27, 2011-2022



Source: authors' calculation.

Societal resilience has had a slightly increasing trend until 2019. The somewhat more visible increase in 2019 was driven by an increase in the uptake of *high-speed internet access* across Europe (Figure 22). The drop in 2020 is due to a deterioration of *preventable and treatable mortality,* accompanied by further declines in *household debt* and *adult participation in learning.* The latter indicator recovered right away, and together with an improvement in the *impact of social transfers on poverty reduction*, this pushed the index up in 2011. The *impact of social transfers* indicator, however, has worsened in 2022, causing the drop in the index.

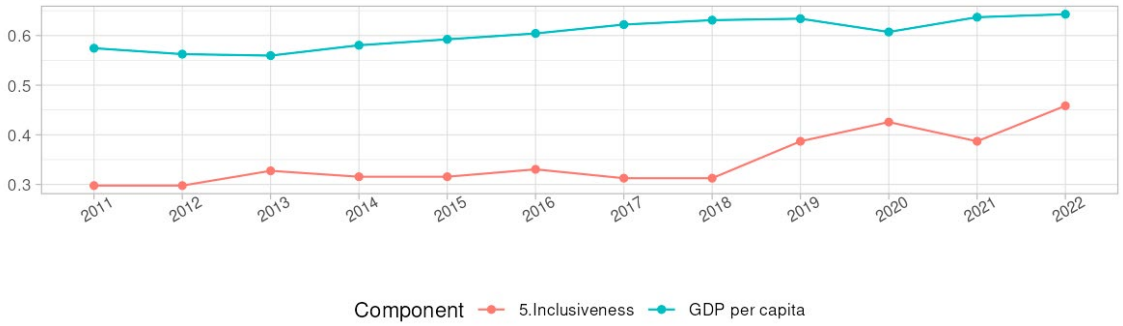
Figure 23. Evolution of the nature and planetary boundaries synthetic index over time, EU 27, 2011-2022



Source: authors' calculation.

The component of *nature and planetary boundaries* has seen a consistent though small improvement until 2020 (Figure 23), with improvements in the situation of the s*hare of renewables in energy consumption*, *gross environmental value added, net GHG emissions, and air pollution* (only in 2018-20). In 2017, there was a deterioration of *air pollution* and the *water exploitation index* that drove the index slightly down. In 2020, at the onset of COVID pandemic and the restrictions of movement and economic activities, *consumption footprint, net GHG emissions* and *air pollution* saw an improvement, coupled with an uptake of green economy, measured by the increase of *environmental gross value added*. 2021 and 2022 then brought a decline, mostly due to a worsening of the *consumption footprint* indicator.

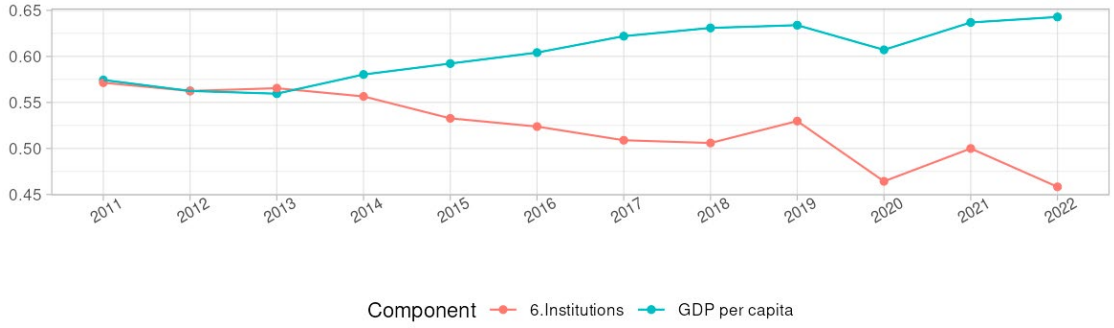
Figure 24. Evolution of the inclusiveness synthetic index over time, EU 27, 2011-2022



Source: authors' calculation.

Figure 24 shows the trend of the *inclusiveness* component over the observed period. Given that the index is based only on three indicators for the EU (at the country level, there is a fourth indicator, the regional dispersion of life expectancy) and one of them has only two observations over time, Caution is warranted when one wants to draw strong conclusions from this figure. The visible improvement after 2018 is driven mostly by the indicator measuring the percentage of citizens who feel discriminated based on various grounds, including religion, disability, political views, socioeconomic situation, etc. Income inequality and the gender gap in employment have seen small movements over the years, with some drops but an overall improvement over time.

Figure 25. Evolution of institutional quality synthetic index over time, EU 27, 2011-2022



Source: authors' calculation.

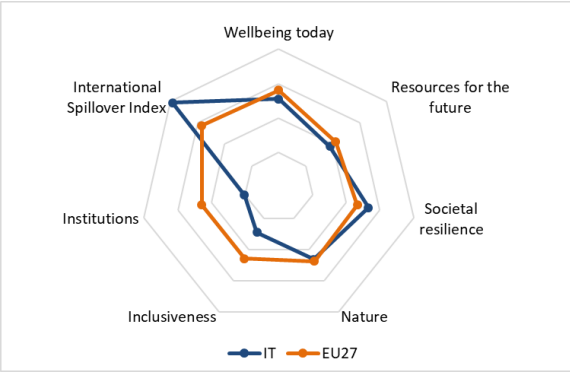
Figure 25 shows that institutional quality at the level of the EU has been declining over the last decade. Though this is a single indicator and not a synthetic index, Annex 11 nevertheless plots also the behaviour of the percentile positions of its six underlying areas. The deterioration is driven mainly by a decline in government effectiveness, the rule of law, and voice and accountability, though the latter saw a rebound in 2021. Political stability declined until 2018, improved in 2019-21, but then saw another significant drop in 2022.

9 Country case: Italy

This chapter illustrates the application of the SIWB dashboard to analyse the state of sustainable and inclusive wellbeing in individual EU Member States. By focusing on Italy as a specific example, this case study highlights the dashboard's ability to provide a nuanced and context-specific understanding of a country's wellbeing challenges and opportunities.

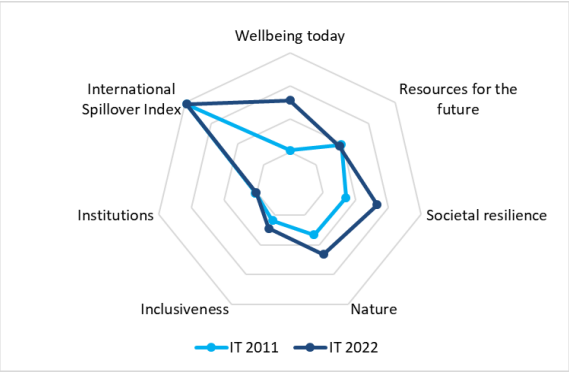
Figure 26a shows that the values of *wellbeing today* and *resources for the future* stand very close to but slightly below the EU level, the value for *resilience* is a bit above, while that for *nature* is practically the same as the EU level. Italy stands significantly below the EU average in the areas of *inclusiveness* and *institutional quality*. The underlying discrepancy in equality indicators is driven by a much worse situation in terms of the *gender employment gap* and *income inequality* as compared to the EU27. When it comes to the *institutional quality*, Italy scores at the bottom of the distribution in terms of *rule of law* and *regulatory quality*.

Figure 26a. Comparison of the SIWB and component indices for Italy and EU27, 2022



Source: authors' calculation.

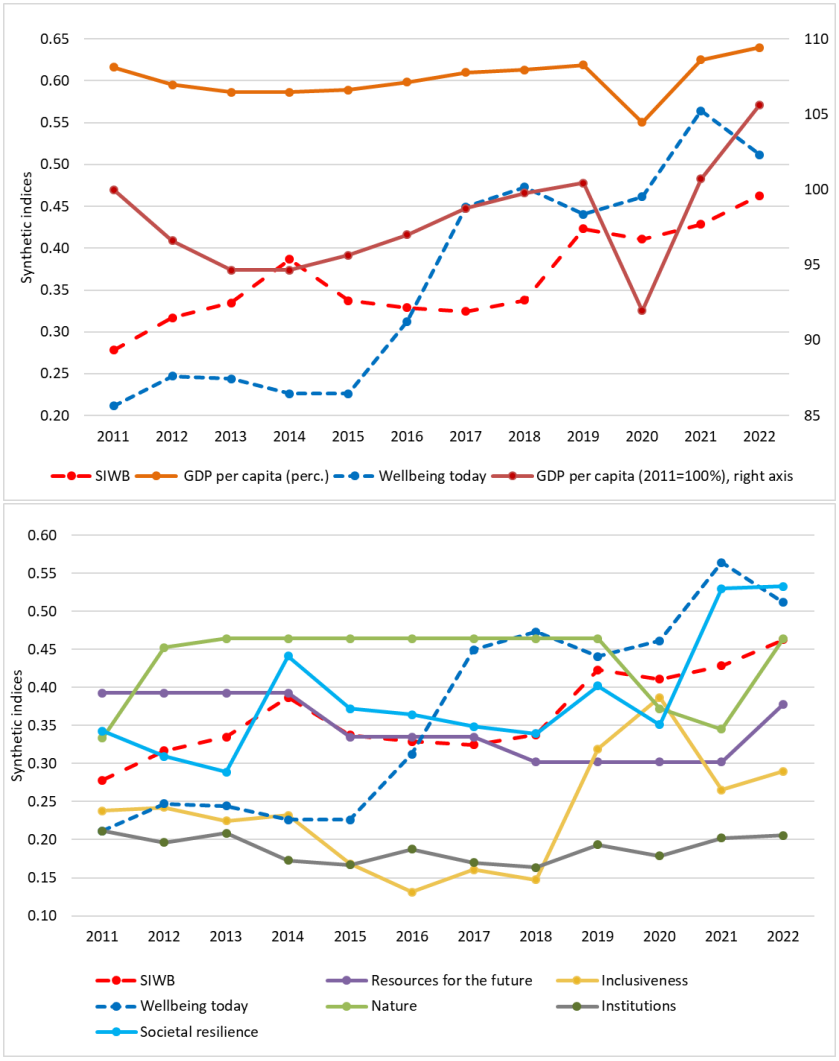
Figure 26b. Comparison of the SIWB and component indices for Italy in 2011 and 2022



Source: authors' calculation.

Figure 26b shows the comparison of Italy's situation in the respective components of SIWB between 2011 and 2022. Over the past decade, Italy has significantly increased the level of *wellbeing today*. As further revealed in Figure 27, *wellbeing today* recorded a prominent increase from 2015 onwards, with most of the indicators in this component recording an upward trend, most prominently *trust in national institutions* and *frequency of contact with friends and family*. *Resources for the future* slightly declined, reaching again the 2011 level in 2022. While the *institutions* and *inclusiveness* synthetic indices have remained relatively steady over the observed period, *societal resilience* and *nature* have notably improved. Looking into the year by year dynamics, the nature index shows important ups and downs, and there is also a remarkable improvement in societal resilience right after the 2020 pandemic year.

Figure 27. Evolution of SIWB index and its components over time, IT, 2011-2022



Source: authors' calculation.

10 Conclusions

The sustainable and inclusive wellbeing dashboard provides a comprehensive approach to measuring wellbeing and sustainability in the European Union. Its six components - *wellbeing today, social and economic resources for future wellbeing, resilience: societal challenges and sustainability transitions, nature and planetary boundaries, inclusiveness*, and *institutional capacity and quality* capture the complex interdependencies that affect the wellbeing of all people and the planet, today and tomorrow.

The dashboard's indicators and synthetic measures provide a nuanced understanding of the state of wellbeing in the EU and its Member States, highlighting areas of strengths and weaknesses, and identifying areas where targeted interventions are needed to address existing vulnerabilities and to improve the wellbeing of current and future generations.

The report highlights the need for a more integrated approach to policymaking, one that takes into account the social, economic, environmental, and intergenerational dimensions of wellbeing. The SIWB framework and dashboard offer support to EU policies that aim to balance economic prosperity with sustainability and social equity. At the same time, the dashboard and its indicators do not only allow to bring out trade-offs and synergies between different aspects of sustainable and inclusive wellbeing, but also between wellbeing today and tomorrow. This represents an important entry point for applying a long-run lens to intergenerational fairness policies. Therefore, the dashboard is not only a step towards a more nuanced understanding of wellbeing but also a guiding force for policymaking that aligns with the EU's long-term objectives of peace, sustainability, and the wellbeing of its peoples.

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Annexes

Annex 1. Detailed description of the SIWB framework dimensions

The **dimensions spell out** the more detailed **aspects of the main components** (such as education or health under wellbeing today, or land, soil and forests, under nature and planetary boundaries). The broad description of the components and their dimensions is as follows.

Wellbeing today refers to the range of aspects that influence the quality of living also beyond the material side and living standards. Coherent with (but slightly adjusted from[24]) the Quality of Life framework (Eurostat, 2017), it includes the dimensions of m*aterial living conditions* (including housing), p*roductive and other main activity*, *health*, *leisure and social interactions*, *governance and basic rights*, *natural and living environment* (including safety), and *overall experience of life*.

Sustainability refers to the assessment of wellbeing over time in its *social, economic, and environmental* aspects (following Stiglitz, Sen and Fitoussi, 2009). Measuring sustainability requires an assessment of whether the current level of wellbeing can be maintained for future generations; or in other words, there is intergenerational fairness and solidarity. One factor to take into account is resources for future wellbeing, and another important aspect of sustainability is resilience. This latter reflects both a shock- and a (sustainability) transition perspective, and has been gaining an increasingly important role in policy frameworks[25].

Social and economic aspects of sustainability

- The component s*ocial and economic resources for future wellbeing* refers to a broad compendium of assets (typically stocks and flows/changes in stocks) that support wellbeing over time. They include h*uman capital (health and education)*, *social capital*, and *economic capital*.
- The component *resilience: societal challenges and sustainability transitions* points to vulnerabilities and capacities in making progress amidst present and future societal challenges, and in relation to the management of sustainability transitions. It connects to the drivers of change and ongoing megatrends[26] and is organized in four dimensions[27]: s*ocial and economic resilience*, *digitalisation and technological change*, g*eopolitical resilience*, and *demography and urbanisation*.

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[24] Based on the comments received during the first exploratory consultations, the proposal differs from the QoL in the following: i) housing, given its importance, is taken out from the material living conditions, ii) economic security, due to the inherent similarities, is put together with material living conditions.

[25] Initiated in the 2020 Strategic Foresight Report (European Commission, 2020), the Commission has published its Resilience Dashboards in 2021. Starting in 2023, the dashboards are incorporated in the country reports of the Spring package of the European Semester. The 2024 Council document on the Economic Governance Review (European Council, 2024) emphasises that reforms and investments should be "growth and resilience-enhancing" (p11). For a recent overview, see Benczur et al. (2023).

[26] https://knowledge4policy.ec.europa.eu/foresight/tool/megatrends-hub_en

[27] These four dimensions are closely related to the three non-environmental dimensions of the Resilience Dashboards, with two differences. One is to broaden the digital dimension to incorporate other aspects of technological change. The other is to create a separate demography and urbanisation challenge, which were previously covered partly by the geopolitical and partly by the social and economic dimension. This slight adjustment allows a more balanced alignment with the 14 Megatrends.

Environmental aspects of sustainability

Originally, this component had two separate but interconnected subcomponents.

- *Natural capital/endowment* refers to the status and condition of the biotic and abiotic natural systems and their contributions to people[28]. Its dimensions include *biodiversity*, *land, soil and forests*, and *air and water*. These are broadly aligned with various existing definitions of natural capital[29] and the System of Environmental Economic Accounting (SEEA) classification of environmental assets (United Nations, 1997).
- *Resilience: nature and planetary boundaries* are designed to reflect pressures from human activities to nature and planetary boundaries (e.g. greenhouse gas emissions)[30], vulnerabilities to challenges that the environment may pose to human wellbeing (e.g. fatalities from climate extremes), and capacities to mitigate and cope with these pressures and vulnerabilities (e.g. technological development)[31]. Its dimensions include *safeguarding ecosystems and biodiversity, zero pollution and toxic free environment, climate change mitigation and adaptation, sustainable use of resources*[32]*, and green economy and policies*.

When populating these dimensions with indicators and streamlining the emerging indicator selection, it became clear that the distinction between similar parts of the subcomponents is often difficult. For this reason, and also to facilitate the simplification and streamlining of the selection, these subcomponents were merged into a common component.

- The component *nature and planetary boundaries* includes all environmental aspects of sustainability in a unified fashion, including the status and condition of nature (as an endowment, a source of contributions to people, and a resource for the future), aspects of resilience with respect to nature-related challenges, and the planetary boundaries. Its dimensions are *safeguarding ecosystems and biodiversity*, *climate change mitigation and adaptation*, *sustainable use of resources*, and *green economy and policies*.

Inclusiveness refers to the ability of the society to achieve distributional fairness and equity, and leave no one and no place behind. It is considered as an analytical lens through which the other dimensions in the framework are observed, by looking at vertical (at-risk of poverty, wealth and

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28 The dimension *Natural and living environment* in the component *Wellbeing today* also includes elements that directly affect people's surroundings and quality of life (e.g. access to green areas or exposure to grime, pollution and other environmental problems).

29 See OECD (2008) and United Nations (2014).

30 Although the violation of planetary boundaries is not always possible to quantify (especially at the Member State level), it is foreseen that the framework will incorporate several indicators that point to the pressure and impact of societal activities on the planetary boundaries.

31 Nature's own vulnerabilities and capacities are included in the natural capital/endowment component, as they are difficult to be distinguished from the current status of nature.

32 This component of SIWB is strongly linked to the 8th EAP (European Parliament and the Council, 2022) and is aligned with it the following way. *Climate change mitigation and adaptation* are present in both, as well as *Zero pollution and toxic free environment*. The areas that the 8th EAP labels as *regenerative circular economy*, *environmental and climate pressures related to EU production and consumption*, and *enabling conditions*) broadly correspond to the dimension *Sustainable use of resources* in the SIWB proposed structure. SIWB dimension of *Safeguarding ecosystems and biodiversity* includes the area in 8th EAP called *biodiversity and ecosystems* and elements of *living well within planetary boundaries*. See Annex 3 for more details on the definition of the dimensions.

income inequalities) and horizontal inequalities[33] (i.e. health[34], environmental and climate impacts or education disaggregated by, for example, income quintiles, age, sex, race and/or ethnic origin, disability status, territories, or showing urban-rural gaps). There is also a dimension on the inequality of opportunity, including intergenerational mobility. Furthermore, this component includes spillover effects beyond the EU, i.e. the impact of the EU lifestyle beyond the EU borders (for example, the carbon content of EU imports). Although their measurement might pose challenges, it is important to reflect the principle that wellbeing in the EU should not come at the expense of wellbeing of people *elsewhere* (spatial fairness and equity)[35].

Institutional capacity and quality refers to those characteristics of institutions[36] (formal and informal) and governance that can enable all citizens to be actively involved and to shape the country's development path, its capacity to deliver wellbeing and to deal with challenges. Typical aspects are voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption[37].

[33] Vertical inequality refers to inequality among individuals or households within a given socioeconomic group, while horizontal inequality is defined as inequality among specific groups (typically by age, gender, education). One particular aspect of horizontal inequality is regional inequality. Another approach to inequality is the inequality of opportunity and intergenerational mobility.

[34] A specific type of health inequalities is cancer inequality (see https://cancer-inequalities.jrc.ec.europa.eu/ for the EU).

[35] For instance, spillovers (intended as wellbeing "elsewhere") are considered in the wellbeing approaches of Belgium and the Netherlands. At the EU level, different footprint indicators were published in recent years, measuring the environmental and climate spillovers of EU production and consumption. The footprint of imported consumption can be considered as a direct spillover measure, while the overall footprint is only a related but not a direct measure.

[36] Institutions here have a broad definition as "the rules of the game in a society or, more formally, the humanly devised constraints that shape human interaction" (North, 1990).

[37] As in the European Quality of Government Index, and the Worldwide Governance Indicators.

Annex 2. Criteria for choosing indicators (across different phases)

Criteria	Definition
RELEVANCE	Concept of the indicator matches the SIWB framework dimensions and components
ACCURACY	The indicator accurately measured the concept under investigation and is accepted by staff and stakeholders within the area of expertise
CREDIBILITY	The indicator is unambiguous and has a clear direction (e.g. high value better outcome), is easy to interpret and can be understood by non-experts.
EASY MONITORING	Indicator part of an ongoing series already systematically updated within EU data infrastructure, low cost with acceptable administrative burden.
DATA AVAILABILITY AND PROPERTIES	Indicator easily/readily available and of good quality and harmonised country coverage for 23 Member stages.
TIMELINES AND FREQUENCY	Indicator should be updated at least every 3 years (5 years for Nature), should include at least 5 observations over time, latest available year 2020[38].
METADATA	Indicators definition should come with the unit of measurement, the source of the data, frequency of data collection and any other relevant information to facilitate data sharing, use and reuse, and aggregation.
BALANCING SUBDIMENSIONS	Ensuring a balanced set of indicators across components.

[38] With the exception of indicators where these criteria would not allow for inclusion of any indicators, thus leaving important gaps by excluding the whole subdimension, such as the case of *Participation in any cultural or sport activities in the last 12 months* for 6.1. Leisure and *Frequency of contacts with family and relatives* that are available from EU-SILC only in 2015 for 6.2. Social interactions. For more information refer to the next Annex.

Annex 3. From the pooled indicators to the comprehensive dashboard

Table A3.1 shows the evolution of the number of indicators per component across the various phases of the construction of the dashboard.

Table A3.1. The number of indicators per component across the consecutive phases

Component	**Phase 0** Initial exploration		**Phase 1** Outcome of the first exercise				**Phase 2** Outcome of the second exercise and data availability						**Phase 3**
	All tools pooled	List for first exercise	Main list	Reserve list	New proposals	Total	From second exercise main list	From second exercise reserve list	From second exercise new proposal	New proposal	Reinserted from first exercise	**Total**	**Total**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	**(12)**	**(14)**
Wellbeing today	354	**140**	37	16	13	**66**	25	4	6	1	4	**40**	**35**
Social and economic resources for future wellbeing	130	**48**	18	7	1	**26**	15	1	1	1	1	**19**	**18**
Resilience: societal challenges and sustainability transitions	256	**134**	30	22	2	**54**	27	7	3	1	3	**41**	**37**
Natural capital/endowment	44	**25**	7	4	0	**11**	24	12	0	1	4	**41**	**39**
Resilience: nature and planetary boundaries[39]	250	**73**	21	18	2	**41**							
Inclusiveness	54	**33**	7	9	4	**20**	5	1	4	1	0	**11**	**10**
Institutional capacity and quality	28	**13**	13	0	0	**13**	1	0	0	0	0	**1**	**1**
Total	**1116**	**466**	**133**	**76**	**22**	**231**	**97**	**25**	**14**	**5**	**12**	**153**	**140**
Total without institutions	1088	453	120	76	22	218	96	25	14	5	12	152	139

[39] Merged as nature and planetary boundaries during the evaluation of phase 2.

Phase 0

We have started from pooling all the (mapped) indicators of the agreed frameworks, except some, which were deemed not to relate to SIWB (mostly very detailed indicators from the European Semester, and some others). The number of indicators (by component) is shown in column 1. The next step was to identify the complete or near-complete overlaps among these overlaps, which led to column 2. This corresponds to the list of indicators that were considered in the first (prioritisation) exercise.

Phase 1

In the first phase we have launched the first prioritization exercise within the Commission's Inter-service working group (ISWG), asking the members to assign the level of priority of each of the listed indicator across dimensions, considering its importance and relevance in their policy work. Based on the prioritisation votes and proposed additional indicators, we have created the list for the second exercise, aimed at selecting the starting set of indicators for the detailed statistical analysis (column 6). For this exercise we have already included the data links in the tools as well, so that it became possible to assess the data availability situation. This exercise had a main list (indicators with strong support; column 3), a reserve list (indicators with some support, but which may turn out to be important for comprehensiveness or balance across to components and dimensions; column 4), and included some new proposals (which were not included in the first exercise; column 5).

Phase 2

We have conducted the second prioritization exercise based on the list of 231 indicators shortlisted in the previous phase. At this stage we combined the outcome of the second exercise with data availability checks (availability criteria were: at least 5 points available; latest year at least 2020; country coverage at least 23 MS; frequency of availability at least every 3 years). In some cases we made exceptions and included indicators with imperfect availability, due to their uniqueness to represent important areas of wellbeing. It was very likely that these indicators will be dropped in the consecutive phase, but we wanted to keep the list still rather comprehensive. The list of indicators that were dropped due to data availability issues (or kept despite an imperfect record) are reported in Annex A3.1.

Most of the selected indicators were from the "second exercise main list" (column 7), a smaller number from the "second exercise reserve list" (column 8), and some from the indicators that were proposed as new in the second exercise (column 9). In case of closely related indicators, we replaced them by their averages (column 10)[40]. Finally, we have added back some earlier indicators in case certain subdimensions were under covered (column 11). This led to the final total of 153 indicators (column 12).

By looking at the indicators in each dimension and subdimension, it became clear that the subcomponent "natural capital/endowment" had many potential overlaps and commonalities with the "safeguarding ecosystems and biodiversity dimension" of the "resilience: nature and planetary boundaries" subcomponent. Taking into account also the relatively low number of indicators per subdimension here, and many previous proposals to simplify the structure of the nature part, these

[40] We created the indicator on average trust in the European Parliament, European Commission and the European Central Bank; concentration of extra-EU trade partners: exports and imports -- created and added back from the previous round, formal and informal voluntary activities; contacts with family and relatives and contact with friends; underachievement in reading, maths and science as the average of the underlying three indicators; designated protected areas as the average of marine and terrestrial.

two components were unified into the single component “nature and planetary boundaries”. Its dimension “safeguarding ecosystems and biodiversity” contains 6 subdimensions: biodiversity status and preservation, land, soil, forest, air, and water.

At the same time, there was only a single indicator that remained in the “zero pollution and toxic-free environment” dimension (premature death due to PM 2.5). All the others had missing data, were not supported, or were classified elsewhere (in biodiversity, most frequently). We thus moved this indicator into health, and removed the dimension from the streamlined structure. Similarly, the indicators in the education dimension of the current wellbeing component were placed in the knowledge, skills and competences subdimension of human capital.

To further simplify the structure, we have merged the housing dimension as a subdimension into the material living conditions and economic security dimension. Similarly, we moved the safety dimension into the natural and living environment dimension as a new subdimension. Table A3.2 reports the corresponding structure.

Given that the list of indicators for institutional quality is rather limited, and there are a handful of leading candidates for the corresponding selection, we have chosen to make an index of the 6 dimensions of the World Bank’s World Governance Indicators[41].

Phase 3

The next step was to correct (to some degree) the imbalance among the different dimensions and subdimensions. Having a target of 2 indicators per subdimension on average (which would yield a total of approximately 150 indicators). Looking at the indicators subdimension by subdimension, their data availability was reassessed, and checked whether there were some indicators very similar to each other. Annex A3.2 documents the details of this exercise. A list of indicators and their main properties were circulated, following the structure shown in Table A3.2, to the ISWG and feedback was collected. Finally, upon consultation in the ISWG, we have reconsidered a number of indicators that were deemed as important to be included in the medium-sized dashboard, reaching a total number of 140.

[41] Home | Worldwide Governance Indicators (worldbank.org)

Table A3.2. Streamlined structure after phase 3

1. Wellbeing today
1.1. Material living conditions and economic security
1.1.1. Economic and financial security
1.1.2. Income
1.1.3. Material deprivation
1.1.4. Poverty
1.1.5.Housing
1.2. Productive and other main activity
1.2.1. Employment quality
1.2.2. Employment quantity
1.2.3. Unpaid work and inactive
1.3. Health
1.3.1. Access to healthcare
1.3.2. Physical and mental health status
1.4. Leisure and social interactions
1.4.1. Leisure
1.4.2. Social interactions
1.5. Governance and basic rights
1.5.1. Active citizenship - political participation
1.5.2. Trust in institutions
1.6. Natural and living environment
1.6.1. Living environment
1.6.2. Natural environment
1.6.3. Safety
1.7. Overall experience of life

2. Social and economic resources for future wellbeing
2.1. Economic capital
2.1.1. Financial capital
2.1.2. Knowledge capital
2.1.3. Produced capital
2.2. Human capital
2.2.1. Health Determinants
2.2.2. Knowledge, skills and competencies
2.2.3. Physical and mental health
2.3. Social capital
2.3.1. Active citizenship - volunteering
2.3.2. Trust in others
3. Resilience: societal challenges and sustainability transitions
3.1. Social and economic resilience
3.1.1. Economic and financial resilience
3.1.2. Education and health resilience
3.1.3. Policies to facilitate transitions and decrease the vulnerabilities
3.1.4. Social impact of transitions
3.2. Digitalisation and technological change
3.2.1. Cybersecurity
3.2.2. Digital economy
3.2.3. Digital public services
3.2.4. Digital skills
3.3. Geopolitical resilience
3.3.1. Financial globalization
3.3.2. Raw materials and energy supply
3.3.3. Value chains and trade
3.4. Demography and urbanisation
3.4.1. Migrant integration
3.4.2. Migration flows
3.4.3. Population dynamics
3.4.4. Urbanisation

4. Nature and planetary boundaries
4.1. Safeguarding ecosystems and biodiversity
4.1.1. Biodiversity status and preservation
4.1.2. Land
4.1.3. Soil
4.1.4. Fores
4.1.5. Air
4.1.6. Water
4.2. Climate change mitigation and adaptation
4.2.1. Drivers: Energy
4.2.2. Drivers: Transport
4.2.3. Emissions
4.2.4. Pressures and policies
4.3. Sustainable use of resources
4.3.1. Circular material use and waste
4.3.2. Material efficiency and footprint
4.4. Green economy and policies
4.4.1. Green economy and finance
4.4.2. Green policies
5. Inclusiveness
5.1. Inequalities
5.2. Spillovers
6. Institutional capacity and quality
6.1. Control of corruption
6.2. Government effectiveness
6.3. Political stability
6.4. Regulatory quality
6.5. Rule of law
6.6. Voice and accountability

Annex 3.2. Selection process from 231 indicators to 153 indicators

Current wellbeing (out of the 66)

Excluded due to data availability issues (-17)

- Leisure and social interaction indicators (a total of 2) can be created from raw SILC microdata, but they require a sizable effort. We put this into our “immediate next steps” list.
- Loneliness so far is a single year measure.
- Noise from transport is a single year measure and we decided to keep the proxy existent in EU-SILC (Noise from neighbours or from the street)
- Could not locate sufficient data for the congestion indicator from the Semester
- Trust in the legal system and Trust in the polices were only available for few years
- Brain-Drain indicators was an aspect considered in a broader index and we considered the index as too broad to capture in a meaningful way the concept proposed
- Share of underachievement in reading, mathematics and science (combined) among disadvantaged students is a one-time calculated indicator in a JRC report
- Frequency of participation in cultural activities in the last 12 months, Frequency of participation in sport activities in the last 12 months, Frequency of contacts with family and relatives, Persons who have someone to ask for help, Safety at night, Access to green space, Frequency of being happy in the last 4 weeks, Percentage of the population rating their satisfaction as high

All of these in the latter bullet had major statistical lags (latest year 2019 for the first one, 2018 for the last two, 2015 for most of the others), and only a low number of years with data.

Indicators kept despite an imperfect data availability record (3)

- Persons reporting exposure to risk factors that can adversely affect mental wellbeing
- Persons reporting exposure to risk factors that can adversely affect physical health
- Active citizenship

Indicators excluded due to them being part of or proxies of other kept indicators (-9)

- Severe material deprivation rate
- Total population living in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames or floor
- Population having neither a bath, nor a shower, nor indoor flushing toilet in their household
- Insufficient food/Inability to afford a meal with meat, chicken, fish (or vegetarian equivalent) every second day
- Household wealth
- Earnings
- Housing affordability
- Voter turnout
- Exposure to air pollution by particulate matter: the data appears to be discontinued since 2019 and now the preferred concept is **premature deaths due to pm2.5**. which we have in another component

New indicators from either making an average or splitting an indicator (+2)

- Average trust in EU institution (EC, ECB, EP)
- Frequency of contacts with family/relatives and friends

Reinserted from Phase 1 due to considerations of their relevance raised up in the exercise (+4)

- Long working hours in main job
- Persons reporting exposure to risk factors that can adversely affect mental wellbeing
- Persons reporting exposure to risk factors that can adversely affect physical health
- Noise from neighbours or from the street

Indicators excluded here as they also appear in other components (the feedback received suggested to avoid overlaps in indicators across components) (-6)

- Smoking prevalence
- Healthy life years at age 65, Healthy life years at birth
- Obesity rate by body mass index
- Lower-secondary completion only
- PISA score at the top and bottom

Social and economic resources for future wellbeing (out of the 26)

Excluded due to data availability issues (-2)

- Daily consumption of fruit and vegetables
- Time spent on health-enhancing (non-work-related) aerobic physical activity

Both were from the Quality of Life, based on the EHIS survey. We could not locate data since 2019, neither the predecessor prior to 2014 (there was a first wave in 2006-9 for 17 EU MS only, but the data is not reported in the ESTAT browser).

Indicators kept despite an imperfect data availability record and also were divided into formal and informal (+1)

- Formal voluntary activities
- Informal voluntary activities

New indicators from either making an average or splitting an indicator (-2):

- Average underachievement in reading, math, science

In the Economic Capital dimensions we were suggested to keep the stocks and to balance between the produced, knowledge and financial capital therefore we dropped (-3)

- Net private investments
- Produced fixed assets
- Intellectual property assets
- Gross fixed capital formation (GFCF) was replaced by the net fixed capital formation

Indicators excluded due to them being part of or proxies of other kept indicators (-1)

- Public share of health expenditure

Resilience: Societal challenges and sustainability transitions (out of the 54)

Indicators were added here from other components (+2)

- PISA score at the top and bottom
- Premature deaths due to exposure to PM2.5

Indicators excluded due to the need to make this component smaller (-19)

- Financial net worth of government, Non-performing loans, Private sector debt, consolidated (% of GDP), Active labour market policies per person wanting to work, Labour market insecurity
- ICT sector R&D intensity, Internet access, E-health, Female ICT specialists
- Financial integration, Inward FDI partner concentration, Value added share of foreign enterprises, Concentration in selected raw materials, EU self-sufficiency for raw materials, Extra-EU export partner concentration, Extra-EU import partner concentration, Trade Partner Concentration Index (HHI)
- Asylum applications by state of procedure, Built-up areas

New indicators from either making an average or splitting an indicator (+1)

- Extra-EU partner concentration (average of the imports and exports)

Reinserted from Phase 1 due to considerations of their relevance raised up in the exercise (+3)

- Banking sector total capital ratio
- Insurance sector solvency capital ratio
- SMEs with at least a basic level of digital intensity

Nature and planetary boundaries (out of the 52)

Indicators excluded here as they also appear in other components (the feedback received suggested to avoid overlaps in indicators across components) (-1)

- Premature deaths due to exposure to PM2.5

Excluded due to data availability issue (-8)

- Share of electrified rail
- Gross nutrient balance in agricultural land – nitrogen, Gross nutrient balance in agricultural land – phosphorus
- Nitrate in groundwater
- Designated terrestrial protected areas, Designated marine protected areas
- Harmonised risk indicator 1 for pesticides
- Excise duties on fuels

Indicators kept despite an imperfect data availability record

- Farmland bird index, Share of forest area
- Soil sealing index, GHG emissions from land use, land use change and forestry, fatalities from climate extremes, green bonds

Indicators excluded due to them being part of or proxies of other kept indicators (-7)

- Share in energy mix (solid fossil fuels, peat and oil shale, oil, gas, nuclear, renewable)
- Year of life lost due to PM 2.5
- Climate protection gap
- Atmospheric carbon dioxide concentration
- Marine waters affected by eutrophication
- GHG emissions intensity
- Environmental technology patents per capita

Reinserted from Phase 1 or added due to considerations of their relevance raised up in the exercise (+5)

- Land take (km2 per year)

- Forest connectivity (0-100 %)
- GHG emissions intensity of employment
- Generation of waste excluding major mineral wastes by hazardousness
- Natura 2000 protected areas (to replace Designated protected areas)

Inclusiveness (out of the 20)

Excluded due to data availability issue (-5)

- Consumption footprint of imports currently not available/under revision
- Carbon footprint of imports
- Material footprint of imports
- Social footprint
- Gender pay gap in unadjusted form

Indicators kept despite an imperfect data availability record

- Spillover index score (SDSN study)

Indicators excluded due to them being part of or proxies of other kept indicators (-4)

- Physical and sexual violence to women
- Income share of the bottom 40 % of the population
- Gini coefficient disposable income post taxes and transfers
- Employment gap (EU versus non-EU nationals)

Indicators excluded due to their merge into one (-2)

- Ex-ante inequality of opportunity in having problems to make ends meet
- Ex-ante inequality of opportunity in tertiary education attainment

New indicators from either making an average or splitting an indicator (+2)

- Ex-ante inequality of opportunity index
- Feeling discriminated

Institutional capacity and quality (out of the 13)

We have chosen to make **an index** of the 6 dimensions of the World Bank's World Governance Indicators:

1. Control of corruption
2. Government effectiveness
3. Political stability
4. Regulatory quality
5. Rule of Law

6. Voice and accountability

Selection process: from 153 indicators to 140 indicators

Current wellbeing (out of the 40)

Poverty (-2)

- we eliminated the AROP and AROP for children indicators, and kept the corresponding AROPE versions

Quality of employment (-3)

- we reversed the decision to keep the indicators on Persons reporting exposure to risk factors that can adversely affect mental wellbeing and Persons reporting exposure to risk factors that can adversely affect physical health, which have a low frequency (and hence number of available years)
- from the two similar indicators of Involuntary temporary employment and Involuntary part-time employment, we kept only the former which had a higher support in the selection exercise

Social interactions (-1)

- we made an average of the Frequency of contacts with family and relatives and Frequency of contacts with friends

Housing (+1)

- population unable to keep home adequately warm was reinserted due to considerations of their relevance raised up in the exercise

Social and economic resources for future wellbeing (out of the 19)

Knowledge, skills and competencies and Physical and mental health (-2)

- we created a single indicator for government expenditure by function: education, health, and social protection, and moved to Policies to facilitate transitions and decrease the vulnerabilities

Physical and mental health (-1)

- we select only one of the healthy life years at birth or at 65 indicators, the one at birth

Produced capital (+1)

- produced fixed assets was reinserted due to considerations of their relevance raised up in the exercise

Knowledge, skills and competencies (+1)

- early childhood education (children aged 3 and over) was reinserted due to considerations of their relevance raised up in the exercise

Resilience: Societal challenges and sustainability transitions (out of the 41)

Policies to facilitate transitions and decrease the vulnerabilities (-1)

- we dropped the Aggregate replacement ratio for pensions (excluding other social benefits) as it was deemed too specific
- we replaced General government expenditure by function: Social Protection with the sum for education, health and social protection (only a substitution)

Education and health resilience (-1)

- we dropped the PISA score at the top and bottom as it was very similar with the concept present in the Variation in performance explained by students' socio-economic status

Digital public services (-1)

- we kept digital public services for businesses, and for citizens, but dropped the similar indicator on e-government users

Raw materials and energy supply (-1)

- we dropped the indicator Energy import dependency as the Material import dependency was already covering "energy"

Reinserted due to considerations of their relevance raised up in the exercise (+2)

- Net lending/borrowing
- Difference in GINI coefficient before and after taxes and social transfers (pensions excluded from social transfers)

We averaged the indicators (-2)

- Supplier concentration in base metals and Supplier concentration in energy carriers
- Trade openness extra-EU and intra-EU

Nature and planetary boundaries (out of the 41)

Drivers: Energy (-1)

- Earmarked to choose one from primary versus final energy consumption and we chose the primary

Emissions (-2)

- We keep the carbon footprint but not GHG emissions per capita, keep the GHG emissions intensity of the economy but not of employment

Circular material use and waste (-1)

- We keep Generation of waste excluding major mineral wastes by hazardousness and drop the Generation of municipal waste per capita

Reinserted or added due to considerations of their relevance raised up in the exercise (+2)

- Nitrate in groundwater
- Added a new indicator on Ecological status of water

Inclusiveness (out of the 11)

- keep the gender employment gap and not the Gender Equality Index (-1)

Annex 4. Detailed description of the indicators in the list of 50

Indicator name	Dimension	Subdimension	Definition	Source
1. Wellbeing today				
Real gross disposable income of households per capita	1. Material living conditions and economic security	1.2. Income	Gross disposable income of households and Non-Profit Institutions Serving Households (NPISH) adjusted by Harmonized Index of Consumer Prices (HICP), by the total resident population.	Eurostat
At risk of poverty or social exclusion rate (AROPE)	1. Material living conditions and economic security	1.4. Poverty	Share of people who are at risk of poverty, and/or severely materially and socially deprived and/or lives in a household with very low work intensity.	Eurostat
Inability to keep home adequately warm	1. Material living conditions and economic security	1.4. Poverty	Share of the population that cannot afford to keep the home adequately warm.	Eurostat
Housing cost overburden rate	1. Material living conditions and economic security	1.5. Housing	Share of population living in households that spend 40 % or more of the household disposable income on housing ('net' of housing allowances). Housing costs include rental or mortgage interest payments and cost of utilities (water, electricity, gas or heating).	Eurostat
In-work at-risk-of-poverty rate	2. Productive and other main activity	2.1. Employment quality	Share of persons who are employed and have an equivalised disposable income below the risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income (after social transfers).	Eurostat
Employment rate	2. Productive and other main activity	2.2. Employment quantity	Share of the population aged 20 to 64 that is employed.	Eurostat
Young people neither in employment nor in education and training (NEETS)	2. Productive and other main activity	2.3. Unpaid work and inactive	Share of people aged 15-29 meeting the following two conditions: (a) are unemployed or outside the labour force according to the ILO definition and (b) have not received any education or training (i.e. neither formal nor non-formal) in the four weeks preceding the LFS.	Eurostat

UHC service coverage index	3. Health	3.1. Access to healthcare	Service Coverage Index (SCI) for essential health services (based on tracer interventions that include reproductive, maternal, newborn and child health, infectious diseases, no communicable diseases and service capacity and access). It is presented on a scale of 0 to 100.	WHO
Deaths from suicide	3. Health	3.2. Physical and mental health status	Death rate of the population due to suicide and intentional self-harm adjusted to a standard age distribution.	Eurostat
Frequency of contacts with family and friends	4. Leisure and social interactions	4.2. Social interactions	Percentage of people meeting socially with friends, relatives or work colleagues once a week.	European Social Survey
Average trust in national government and parliament	5. Governance and basic rights	5.2. Trust in institutions	Percentage of people stating that they trust national government and parliament.	Eurobarometer
Pollution, noise, grime or other environmental problems	6. Natural and living environment	6.1. Natural environment	Share of the population reporting exposure to pollution, grime, noise or other environmental problems	Eurostat
Traffic deaths	6. Natural and living environment	6.3. Safety	Number of fatalities caused by road accidents, including drivers and passengers of motorised vehicles and pedal cycles as well as pedestrians.	Eurostat
Average rating of life satisfaction overall	7. Overall experience of life	7.1. Satisfaction with life overall	Average score reported by people when asked to rate their satisfaction with life from 0 (very dissatisfied) to 10 (very satisfied)	Eurostat
2. Social and economic resources for future wellbeing				
Net fixed capital formation (NFCF)	1. Economic capital	1.3. Produced capital	Net fixed capital formation consists of gross fixed capital formation less consumption of fixed capital.	AMECO
Total fixed assets	1. Economic capital	1.3. Produced capital	Fixed assets consist of a subset of produced assets (mostly machinery, equipment, buildings or other structures) that are	Eurostat

			used repeatedly or continuously in production over periods of time of more than one year.	
Life expectancy	2. Human capital	2.2. Physical and mental health	Life expectancy at certain ages represents the mean number of years still to be lived by a person who has reached a certain exact age, if subjected throughout the rest of his or her life to the current mortality conditions (age-specific probabilities of dying).	Eurostat
Tertiary education attainment	2. Human capital	2.3. Knowledge, skills and competencies	Share of the population aged 25-34 who have successfully completed tertiary studies (e.g. at university or a higher technical institution).	Eurostat
Underachievement in reading, math, science	2. Human capital	2.3. Knowledge, skills and competencies	Share of 15-year-old students failing to reach level 2 ('basic skills level') on the PISA scale for the three core school subjects of reading, mathematics and science.	Eurostat
Participation in voluntary activities	3. Social capital	3.1. Active citizenship - volunteering	Percentage of people who claimed they participated in voluntary activities (formal or informal) in the last twelve months. Formal volunteering relates to any unpaid non-compulsory work for or through an organisation, a formal group or a club. Informal voluntary activities can include helping other people, animals, cleaning a beach or a forest for example.	Eurostat
3. Resilience: societal challenges and sustainability transitions				
Household debt (% of net disposable income)	1. Social and economic resilience	1.1. Economic and financial resilience	Total outstanding debt of households (including non-profit institutions serving households), which includes loans (primarily mortgage loans and consumer credit) and other accounts payable.	Eurostat
Adult participation in learning	1. Social and economic resilience	1.2. Education and health resilience	Share of people aged 25 to 64 who stated that they received formal or non-formal education and training in the last 4 weeks preceding the survey. Adult learning covers both general and vocational formal and non-formal learning activities. Adult learning usually refers to learning activities after the end of initial education.	Eurostat

Standardised preventable and treatable mortality (low rate)	1. Social and economic resilience	1.2. Education and health resilience	Preventable mortality refers to mortality that can mainly be avoided through effective public health and primary prevention interventions (i.e. before the onset of diseases/injuries, to reduce incidence). Treatable mortality can mainly be avoided through timely and effective health care interventions, including secondary prevention and treatment (after the onset of diseases to reduce case-fatality).	Eurostat
Impact of social transfers (excluding pensions) on poverty reduction	1. Social and economic resilience	1.3. Policies to facilitate transitions and decrease the vulnerabilities	Reduction in percentage of the risk of poverty rate, due to social transfers	Eurostat
High-speed internet coverage	2. Digitalisation and technological change	2.2. Digital economy	Share of households with fixed very high capacity network (VHCN) connection.	Eurostat
At least basic digital skills	2. Digitalisation and technological change	2.4. Digital skills	Share of people aged 16 to 74 who have at least basic digital skills. It is a composite indicator based on selected activities performed on the internet in specific areas: information and data literacy, communication and collaboration, digital content creation, safety and problem solving.	Eurostat
Net International Investment Position	3. Geopolitical resilience	3.1. Financial globalization	Difference between an economy's external financial assets and liabilities, calculated as percentage of GDP, multiplied by minus one (so that the higher the more vulnerable).	Eurostat
Material import dependency	3. Geopolitical resilience	3.2. Raw materials and energy supply	Ratio of imports (IMP) to direct material inputs (DMI) in percentage, indicating reliance on imports for meeting material needs, ranging from 0% to 100%.	Eurostat
Concentration of value chain partners	3. Geopolitical resilience	3.3. Value chains and trade	Average of the concentration (Herfindahl) index of each Member States' extra-EU partners for imported and re-exported content. The importing concentration is calculated as the squared sum of imports by source country as share of the importing country's GDP. The re-exporting concentration is calculated as the squared sum of re-exports by destination country as share of the re-	Figaro

			exporting country's GDP. The resulting index has been multiplied by 1000.	
Net migration rate	4. Demography and urbanisation	4.1. Migration flows	Net migration rate measured as the difference between immigration and emigration to non-EU-27 countries relative to the host country's population.	Eurostat
Projected old-age dependency ratio	4. Demography and urbanisation	4.2. Population dynamics	Estimated ratio of persons aged 65 and over to persons aged 15-64 in 2050, considering future fertility rates, probabilities of dying, and net migration. Projections based on data up to 2023.	Eurostat
4. Nature and planetary boundaries				
Farmland bird index	1. Safeguarding ecosystems and biodiversity	1.1. Biodiversity status and preservation	Average population trend of bird species in farmland habitats.	Eurostat
Natura 2000 protected areas	1. Safeguarding ecosystems and biodiversity	1.1. Biodiversity status and preservation	The indicator comprises nationally designated protected areas and Natura 2000 sites. A nationally designated area is an area protected by national legislation. Marine and terrestrial combined.	Eurostat
Natural and semi-natural vegetated land	1. Safeguarding ecosystems and biodiversity	1.2. Land	Percentage of total land area composed of tree cover, grassland, wetland, shrubland and sparse vegetation.	OECD
Air pollution pm2.5	1. Safeguarding ecosystems and biodiversity	1.5. Air	Population weighted average of annual average concentration of particle matter of size 2.5 micrometers (small particles) in $\mu g/m^3$, interpolated at 1 km^2 grid cell level and combined with GEOSTAT 1 km^2 grid population data (for NUTS2 in SPI).	Eurostat
Ecological status of water	1. Safeguarding ecosystems and biodiversity	1.6. Water	Ecological status is an assessment of the quality of the structure and functioning of surface water ecosystems. It shows the influence of pressures (e.g. pollution and habitat degradation) on the identified quality elements	EEA

Water exploitation index plus (WEI+)	1. Safeguarding ecosystems and biodiversity	1.6. Water	The WEI+ measures total water consumption as a percentage of renewable freshwater resources. It quantifies water abstraction, return, and consumption for a given territory, considering river basins and economic sector discharges.	Eurostat
Share of renewable energy in gross final energy consumption	2. Climate change mitigation and adaptation	2.1. Drivers: Energy	Share of renewable energy in gross final energy consumption (defined as gross electricity production from all energy sources plus total imports of electricity minus total exports of electricity).	Eurostat
Share of buses and trains in inland passenger transport	2. Climate change mitigation and adaptation	2.2. Drivers: Transport	Share of collective transport modes in total inland passenger transport performance, expressed in passenger-kilometres (pkm). Collective transport modes refer to buses, including coaches and trolley-buses, and trains. Total inland transport includes transport by passenger cars, buses and coaches, and trains.	Eurostat
Net greenhouse gas emissions	2. Climate change mitigation and adaptation	2.3. Emissions	Man-made greenhouse gas (GHG) emissions and removals of the 'Kyoto basket' (CO2, CH4, N2O, and F-gases), expressed in CO2 equivalents with consideration for each gas's global warming potential (GWP). Net GHG emissions encompass international aviation and GHG removals from LULUCF.	Eurostat
Fatalities from climate extremes	2. Climate change mitigation and adaptation	2.4. Pressures and policies	Number of fatalities to weather or climate-related extreme events over the periods 1980-2019 and 1980- 2020, per 1 million population	EEA
Circular material use rate	3. Sustainable use of resources	3.1. Circular material use and waste	Proportion of recycled material contributing to overall material use. Overall material use combines domestic material consumption (DMC) with circular material use (M = DMC + U). Circular use approximates recycled waste in domestic recovery plants (RCV_R), subtracting imported waste for recycling (IMPw) and adding exported waste for recycling abroad (EXPw).	Eurostat
Consumption footprint per capita	3. Sustainable use of resources	3.2. Material efficiency and footprint	The consumption footprint quantifies the environmental impacts resulting from the consumption, including the embodied and indirect impacts. It accounts for domestic production in the EU and trade with other world regions.	Eurostat

Gross added value of environmental goods and services sector	4. Green economy and policies	4.1. Green economy and finance	The environmental goods and services sector (EGSS) is defined as that part of a country's economy that is engaged in producing goods and services that are used in environmental protection and resource management activities either domestically or abroad.	Eurostat
5. Inclusiveness				
Income quintile share ratio (S80/S20)	1. Inequalities	1. Inequalities	Ratio of total income received by the 20 % of the population with the highest income (the top quintile) to that received by the 20 % of the population with the lowest income (the bottom quintile).	Eurostat
Regional dispersion of life expectancy at birth	1. Inequalities	1. Inequalities	Gap between minimum and maximum life expectancy at the NUTS2 level in a country	Eurostat
Feeling discriminated	1. Inequalities	1. Inequalities	Share of people having felt discriminated for any reason;- including religion, disability, political views, socioeconomic situation, etc., in the past 12 months	Eurobarometer
Gender employment gap	1. Inequalities	1. Inequalities	Difference between the employment rates of men and women aged 20 to 64.	Eurostat
Spillover Index Score	2. Spillovers	2. Spillovers	The Spillover Index assesses such spillovers along three dimensions: environmental & social impacts embodied into trade, economy & finance, and security. A higher score means that a country causes more positive and fewer negative spillover effects.	SDG Transformation Center
6. Institutional capacity and quality				
Worldwide Governance Index	Institutions	Institutions	The WGI feature six aggregate governance indicators for over 200 countries and territories over the period 1996–2022: Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption.	World Governance Indicators

Annex 5. List of the 140 indicators in the comprehensive dashboard

Boldface indicates that an indicator has data availability issues.

Indicator name	**Dimension**	**Subdimension**
Wellbeing today		
Inability to make ends meet	1. Material living conditions and economic security	1.1. Economic and financial security
Real gross disposable income of households per capita	1. Material living conditions and economic security	1.2. Income
Severe material and social deprivation rate	1. Material living conditions and economic security	1.3. Material deprivation
Severe material and social deprivation rate of children, 0-17, %	1. Material living conditions and economic security	1.3. Material deprivation
AROPE for children, 0-17, %	1. Material living conditions and economic security	1.4. Poverty
At risk of poverty or social exclusion rate (AROPE)	1. Material living conditions and economic security	1.4. Poverty
Inability to keep home adequately warm	1. Material living conditions and economic security	1.4. Poverty
Housing cost overburden rate	1. Material living conditions and economic security	1.5. Housing
Severe housing deprivation rate	1. Material living conditions and economic security	1.5. Housing
In-work at-risk-of-poverty rate	2. Productive and other main activity	2.1. Employment quality
Long working hours in main job	2. Productive and other main activity	2.1. Employment quality
People killed in accidents at work	2. Productive and other main activity	2.1. Employment quality
Size of the shadow economy	2. Productive and other main activity	2.1. Employment quality

Employment rate	2. Productive and other main activity	2.2. Employment quantity
Involuntary temporary employment	2. Productive and other main activity	2.2. Employment quantity
Long-term unemployment rate	2. Productive and other main activity	2.2. Employment quantity
Unemployment rate	2. Productive and other main activity	2.2. Employment quantity
Inactive population due to caring responsibilities by sex	2. Productive and other main activity	2.3. Unpaid work and inactive
Young people neither in employment nor in education and training (NEETS)	2. Productive and other main activity	2.3. Unpaid work and inactive
Out-of-pocket expenditure on healthcare	3. Health	3.1. Access to healthcare
Self-reported unmet need for medical care	3. Health	3.1. Access to healthcare
UHC service coverage index	3. Health	3.1. Access to healthcare
Deaths from suicide	3. Health	3.2. Physical and mental health status
Share of people with good or very good perceived health	3. Health	3.2. Physical and mental health status
Participation in any cultural or sport activities in the last 12 months	4. Leisure and social interactions	4.1. Leisure
Frequency of contacts with family and friends	4. Leisure and social interactions	4.2. Social interactions
Active citizenship	5. Governance and basic rights	5.1. Active citizenship - political participation
Average trust in EU institutions	5. Governance and basic rights	5.2. Trust in institutions

Average trust legal system, national government, national parliament	5. Governance and basic rights	5.2. Trust in institutions
Pollution, grime or other environmental problems	6. Natural and living environment	6.1. Natural environment
Crime, violence or vandalism in the area	6. Natural and living environment	6.2. Living environment
Noise from neighbours or from the street	6. Natural and living environment	6.2. Living environment
Standardised death rate due to homicide	6. Natural and living environment	6.3. Safety
Traffic deaths	6. Natural and living environment	6.3. Safety
Average rating of life satisfaction overall	7. Overall experience of life	7.1. Satisfaction with life overall
2. Social and economic resources for future wellbeing		
Financial net worth of the total economy	1. Economic capital	1.1. Financial capital
Gross domestic expenditure on R&D	1. Economic capital	1.2. Knowledge capital
Patent applications to the European Patent Office	1. Economic capital	1.2. Knowledge capital
Net fixed capital formation (NFCF)	1. Economic capital	1.3. Produced capital
Total fixed assets	1. Economic capital	1.3. Produced capital
Obesity rate by body mass index	2. Human capital	2.1. Health Determinants
Smoking prevalence	2. Human capital	2.1. Health Determinants
Spending on prevention	2. Human capital	2.1. Health Determinants

Healthy life years at age 65	2. Human capital	2.2. Physical and mental health
Life expectancy	2. Human capital	2.2. Physical and mental health
Children aged less than 3 years in formal childcare	2. Human capital	2.3. Knowledge, skills and competencies
Early childhood education	2. Human capital	2.3. Knowledge, skills and competencies
Early leavers from education and training	2. Human capital	2.3. Knowledge, skills and competencies
Lower-secondary completion only	2. Human capital	2.3. Knowledge, skills and competencies
Tertiary education attainment	2. Human capital	2.3. Knowledge, skills and competencies
Underachievement in reading, math, science	2. Human capital	2.3. Knowledge, skills and competencies
Participation in voluntary activities	3. Social capital	3.1. Active citizenship - volunteering
Average rating of trust in others	3. Social capital	3.2. Trust in others
3. Resilience: societal challenges and sustainability transitions		
Banking sector total capital ratio	1. Social and economic resilience	1.1. Economic and financial resilience
Degree of specialisation of the economy	1. Social and economic resilience	1.1. Economic and financial resilience
Employment in innovative enterprises	1. Social and economic resilience	1.1. Economic and financial resilience

Government debt	1. Social and economic resilience	1.1. Economic and financial resilience
Household debt (% of net disposable income)	1. Social and economic resilience	1.1. Economic and financial resilience
Insurance sector solvency capital ratio	1. Social and economic resilience	1.1. Economic and financial resilience
Adult participation in learning	1. Social and economic resilience	1.2. Education and health resilience
Antimicrobial resistance	1. Social and economic resilience	1.2. Education and health resilience
Premature deaths due to exposure to PM2.5	1. Social and economic resilience	1.2. Education and health resilience
Standardised preventable and treatable mortality (low rate)	1. Social and economic resilience	1.2. Education and health resilience
Variation in performance explained by students' socio-economic status	1. Social and economic resilience	1.2. Education and health resilience
Difference in GINI coefficient before and after taxes and social transfers (pensions excluded from social transfers)	1. Social and economic resilience	1.3. Policies to facilitate transitions and decrease the vulnerabilities
Government spending on health, education, social protection	1. Social and economic resilience	1.3. Policies to facilitate transitions and decrease the vulnerabilities
Impact of social transfers (excluding pensions) on poverty reduction	1. Social and economic resilience	1.3. Policies to facilitate transitions and decrease the vulnerabilities
Income stabilisation coefficient	1. Social and economic resilience	1.3. Policies to facilitate transitions and decrease the vulnerabilities
Employment in energy-intensive sectors	1. Social and economic resilience	1.4. Social impact of transitions
Employment in manufacturing with high automation risk	1. Social and economic resilience	1.4. Social impact of transitions
Global Cybersecurity Index	2. Digitalisation and technological change	2.1. Cybersecurity

High-speed internet coverage	2. Digitalisation and technological change	2.2. Digital economy
SMEs with at least a basic level of digital intensity	2. Digitalisation and technological change	2.2. Digital economy
Lack of Digital public services for businesses	2. Digitalisation and technological change	2.3. Digital public services
Lack of Digital public services for citizens	2. Digitalisation and technological change	2.3. Digital public services
At least basic digital skills	2. Digitalisation and technological change	2.4. Digital skills
ICT graduates	2. Digitalisation and technological change	2.4. Digital skills
Net International Investment Position	3. Geopolitical resilience	3.1. Financial globalization
Net lending/borrowing	3. Geopolitical resilience	3.1. Financial globalization
Material import dependency	3. Geopolitical resilience	3.2. Raw materials and energy supply
Supplier concentration in base metals and energy carriers	3. Geopolitical resilience	3.2. Raw materials and energy supply
Concentration of value chain partners	3. Geopolitical resilience	3.3. Value chains and trade
Extra-EU trade partner concentration	3. Geopolitical resilience	3.3. Value chains and trade
Trade openness	3. Geopolitical resilience	3.3. Value chains and trade
Intra-EU migration	4. Demography and urbanisation	4.1. Migration flows
Net migration rate	4. Demography and urbanisation	4.1. Migration flows
Population change	4. Demography and urbanisation	4.2. Population dynamics

Projected old-age dependency ratio	4. Demography and urbanisation	4.2. Population dynamics
Total fertility rate (difference from replacement-level)	4. Demography and urbanisation	4.2. Population dynamics
Settlement area per capita	4. Demography and urbanisation	4.3. Urbanisation
4. Nature and planetary boundaries		
Area under organic farming	1. Safeguarding ecosystems and biodiversity	1.1. Biodiversity status and preservation
Farmland bird index	1. Safeguarding ecosystems and biodiversity	1.1. Biodiversity status and preservation
Natura 2000 protected areas	1. Safeguarding ecosystems and biodiversity	1.1. Biodiversity status and preservation
Threatened species (Red List Index)	1. Safeguarding ecosystems and biodiversity	1.1. Biodiversity status and preservation
Land take (km2 per year)	1. Safeguarding ecosystems and biodiversity	1.2. Land
Natural and semi-natural vegetated land	1. Safeguarding ecosystems and biodiversity	1.2. Land
Soil carbon content	1. Safeguarding ecosystems and biodiversity	1.3. Soil
Soil sealing index	1. Safeguarding ecosystems and biodiversity	1.3. Soil
Forest connectivity (0-100 %)	1. Safeguarding ecosystems and biodiversity	1.4. Forest
Share of forest area	1. Safeguarding ecosystems and biodiversity	1.4. Forest
Air pollution pm10	1. Safeguarding ecosystems and biodiversity	1.5. Air

Air pollution pm2.5	1. Safeguarding ecosystems and biodiversity	1.5. Air
Ecological status of water	1. Safeguarding ecosystems and biodiversity	1.6. Water
Nitrate in groundwater	1. Safeguarding ecosystems and biodiversity	1.6. Water
Water exploitation index plus (WEI+)	1. Safeguarding ecosystems and biodiversity	1.6. Water
Energy productivity	2. Climate change mitigation and adaptation	2.1. Drivers: Energy
Primary energy consumption	2. Climate change mitigation and adaptation	2.1. Drivers: Energy
Share of renewable energy in gross final energy consumption	2. Climate change mitigation and adaptation	2.1. Drivers: Energy
Electric and hydrogen passenger fleet	2. Climate change mitigation and adaptation	2.2. Drivers: Transport
Share of buses and trains in inland passenger transport	2. Climate change mitigation and adaptation	2.2. Drivers: Transport
Share of rail and inland waterways in total freight transport	2. Climate change mitigation and adaptation	2.2. Drivers: Transport
GHG emissions from land use, land use change and forestry	2. Climate change mitigation and adaptation	2.3. Emissions
GHG emissions intensity of the economy	2. Climate change mitigation and adaptation	2.3. Emissions
Net greenhouse gas emissions	2. Climate change mitigation and adaptation	2.3. Emissions
Climate-related economic losses	2. Climate change mitigation and adaptation	2.4. Pressures and policies
Fatalities from climate extremes	2. Climate change mitigation and adaptation	2.4. Pressures and policies
Fossil fuel subsidies	2. Climate change mitigation and adaptation	2.4. Pressures and policies

Circular material use rate	3. Sustainable use of resources	3.1. Circular material use and waste
Generation of waste excluding major mineral wastes by hazardousness	3. Sustainable use of resources	3.1. Circular material use and waste
Recycling rate of municipal waste	3. Sustainable use of resources	3.1. Circular material use and waste
Carbon footprint	3. Sustainable use of resources	3.2. Material efficiency and footprint
Consumption footprint per capita	3. Sustainable use of resources	3.2. Material efficiency and footprint
Raw material consumption (Material footprint)	3. Sustainable use of resources	3.2. Material efficiency and footprint
Resource productivity	3. Sustainable use of resources	3.2. Material efficiency and footprint
Employment in the environmental goods and services sector	4. Green economy and policies	4.1. Green economy and finance
Green bonds	4. Green economy and policies	4.1. Green economy and finance
Gross added value of environmental goods and services sector	4. Green economy and policies	4.1. Green economy and finance
National expenditures on environmental protection	4. Green economy and policies	4.2. Green policies
Share of environmental taxes in total tax revenues	4. Green economy and policies	4.2. Green policies
5. Inclusiveness		
Income share of the bottom 40 % of the population	1. Inequalities	1. Inequalities
Income quintile share ratio (S80/S20)	1. Inequalities	1. Inequalities
Regional dispersion of air pollution exposure	1. Inequalities	1. Inequalities

Regional dispersion of household income	1. Inequalities	1. Inequalities
Regional dispersion of life expectancy at birth	1. Inequalities	1. Inequalities
Disability employment gap	1. Inequalities	1. Inequalities
Feeling discriminated	1. Inequalities	1. Inequalities
Gender employment gap	1. Inequalities	1. Inequalities
Ex-ante inequality of opportunity index	2. Inequality of opportunity	2. Inequality of opportunity
Spillover Index Score	3. Spillovers	3. Spillovers
6. Institutional capacity and quality		
Worldwide Governance Index	Institutions	Institutions

Annex 6. Indicator gaps – indicators with unavailable or insufficient data

The following list represents the list of indicators identified by the inter-service working group as desirable but unavailable, either because they are not calculated (not available) or they have insufficient data quality in terms of frequency, timeliness and coverage (poor data). The indicators marked in blue are included in both comprehensive and streamlined dashboards despite their suboptimal data properties as otherwise aspects of Leisure and Social interactions would be entirely neglected in the Wellbeing Today dimension, given the lack of good quality indicators in these areas.

Proposed indicator	Dimension	Subdimension	gap
1. Wellbeing today			
Housing quality (average)	1. Material living conditions and economic security	1.5. Housing quality	not available
Employed persons declaring physical/mental/sexual harassments at work	2. Productive and other main activity	2.1. Employment quality	poor data
Health and safety at work	2. Productive and other main activity	2.1. Employment quality	poor data
Overall job quality	2. Productive and other main activity	2.1. Employment quality	not available
Discrimination in access to healthcare on the grounds of age, sex, race, colour, ethnic or social origin, disability, sexual orientation or sex characteristics	3. Health	3.1. Access to healthcare	poor data
Mental health	3. Health	3.2. Physical and mental health status	poor data
Average tolerance (homosexuals, immigrants, minorities)	4. Leisure and social interactions	4.2. Social interactions	not available
Rate of bullying in children	4. Leisure and social interactions	4.2. Social interactions	poor data
Civic and citizenship competences	5. Governance and basic rights	5.1. Active citizenship - political participation	not available
Frequency of participation in cultural activities in the last 12 months	4. Leisure and social interactions	4.1. Leisure	poor data
Frequency of participation in sport activities in the last 12 months	4. Leisure and social interactions	4.1. Leisure	poor data
Participation in any cultural or sport activities in the last 12 months	4. Leisure and social interactions	4.1. Leisure	poor data

Frequency of being happy in the last 4 weeks	7. Overall experience of life	7.1. Satisfaction with life overall	poor data
Percentage of the population rating their satisfaction as high	7. Overall experience of life	7.1. Satisfaction with life overall	poor data
Transport noise exposure	6. Natural and living environment	6.2. Living environment	poor data
Connectivity (passenger and freight)	6. Natural and living environment	6.2. Living environment	not available
Accessibility of transports	6. Natural and living environment	6.2. Living environment	not available
GVA from criminal activities estimated	6. Natural and living environment	6.3. Safety	poor data
2. Social and economic resources for future wellbeing			
Active mobility (cycling, walking)	2. Human capital	2.1. Health Determinants	not available
Healthy behaviours	2. Human capital	2.1. Health Determinants	poor data
Episodes of heavy episodic drinking	2. Human capital	2.1. Health Determinants	poor data
Daily consumption of fruit and vegetables	2. Human capital	2.1. Health Determinants	poor data
Time spent on health-enhancing (non-work-related) aerobic physical activity	2. Human capital	2.1. Health Determinants	poor data
Intergenerational mobility (Probability of transition from non-tertiary educated parents to tertiary educated children)	2. Human capital	2.2. Knowledge, skills and competencies	not available
Average score at the PIAAC test	2. Human capital	2.2. Knowledge, skills and competencies	poor data
Social protection/healthcare insurance coverage	2. Human capital	2.2. Physical and mental health	poor data
3. Resilience: Societal challenges and sustainability transitions			
Resilience of infrastructure and transports	1. Social and economic resilience	1.1. Economic and financial resilience	not available
DESI connectivity index	2. Digitalisation and technological change	2.2. Digital economy	poor data
DESI integration of digital technology	2. Digitalisation and technological change	2.2. Digital economy	poor data
DESI digital public services	2. Digitalisation and technological change	2.3. Digital public services	poor data
Urban mobility	4. Demography and urbanisation	4.3. Urbanisation	not available

4. Nature and planetary boundaries			
Sustainable fisheries (SDG 14 indicator related to SFY))	1. Safeguarding ecosystems and biodiversity	1.1. Biodiversity status and preservation	poor data
Gross nutrient balance in agricultural land - nitrogen	1. Safeguarding ecosystems and biodiversity	1.3. Soil	poor data
Gross nutrient balance in agricultural land – phosphorus	1. Safeguarding ecosystems and biodiversity	1.3. Soil	poor data
Inland water quality	1. Safeguarding ecosystems and biodiversity	1.6. Water	poor data
Exposure of vulnerable groups and social infrastructure to climate-related risks	2. Climate change mitigation and adaptation	2.4. Pressures and policies	poor data
Environmentally harmful overall subsidies	2. Climate change mitigation and adaptation	2.4. Pressures and policies	not available
5. Inclusiveness			
Meaningful rural/urban gap	1. Inequalities	1. Inequalities	not available
Inclusiveness of the transport system	1. Inequalities	1. Inequalities	not available
Healthy life years at birth (sdg_03_11) by income quintile	1. Inequalities	1. Inequalities	not available
Life expectancy by income quintile	1. Inequalities	1. Inequalities	not available
Total index on inequality of opportunity	2. Inequality of opportunity	2. Inequality of opportunity	not available

Annex 7. Correlation and principal component analysis for the 140 indicators

The statistical analysis in this phase was based on the correlation between the indicators within the same dimension, or subdimension when the dimension was too large and heterogeneous, and principal component analysis (PCA). PCA is a statistical method that transforms a set of correlated indicators into a new set of uncorrelated indicators, called principal components, which capture the most variability in the data. The goal of PCA is to reduce the dimensionality of a dataset while retaining as much information as possible. The indicators with the highest PCA correlation are those that capture the most variance in the data. By selecting these indicators, we are retaining the features that statistically explain the most variability in the dataset. In addition to this information, we look at correlations among indicators to avoid redundancies.

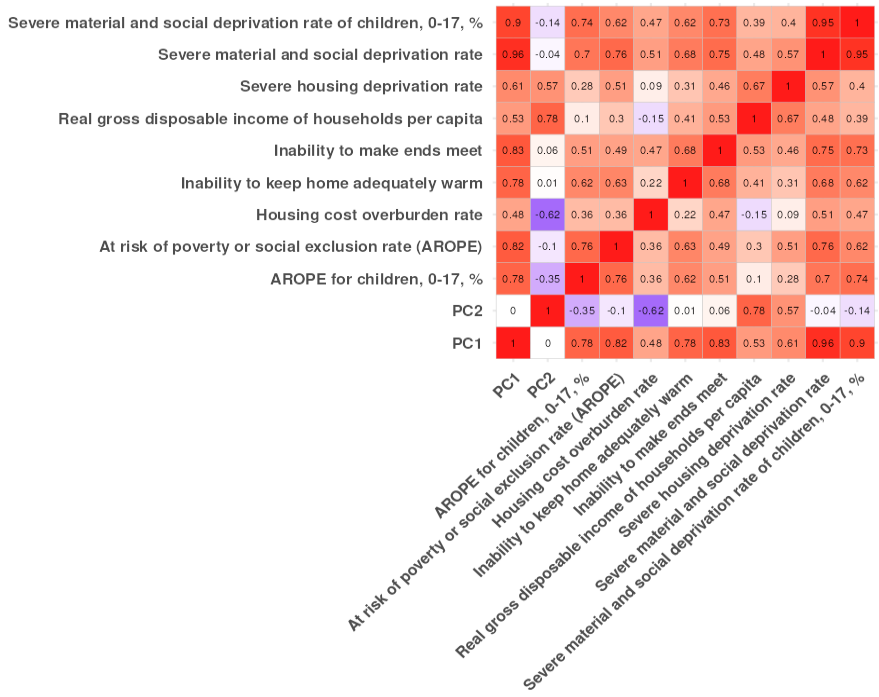
Note also that we have analysed the indicators relating to health from *wellbeing today* and *social and economic resources for future wellbeing* together, and not by their exact subcategory, to find the best representatives for the headline dashboard and avoid overlaps. The same was done in the case of “governance and basic rights” and “social capital”.

In cases where the statistical analysis did not result in a clear choice of indicator, we have looked at additional criteria like their policy importance, as stated in the prioritization exercise, as well as data quality and coverage. Therefore if the choice had to be made between two indicators from the same subcategory and the analysis was not enough to make a choice, we would take the one that got more support in the ISWG prioritization exercise and has better data coverage (timeliness, variation, or availability for global comparison or regional disaggregation). We had tried to keep at least one representative per subdimension (with a few exceptional cases).

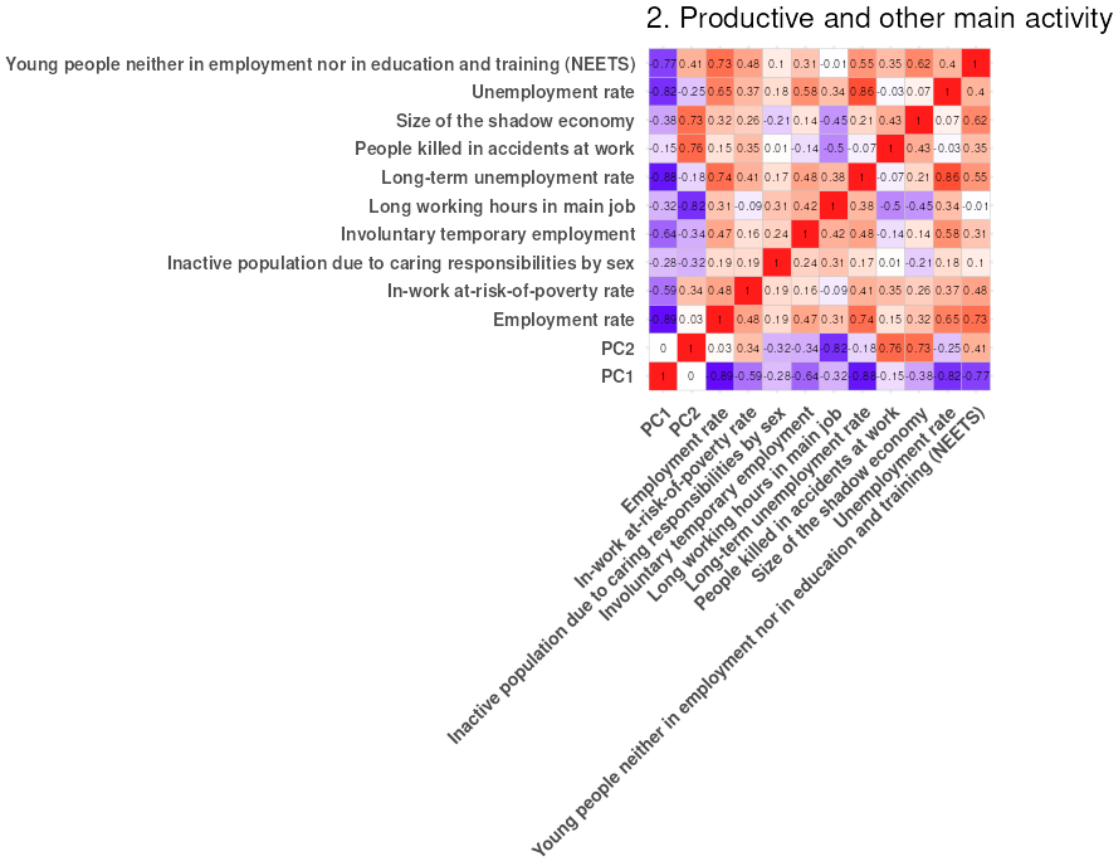
For the purpose of the headline dashboard, we have created additional averages of some pairs of indicators (which remain treated separately in the dashboard of 140): an average of *access to digital services for citizens and businesses*; *average trust in institutions* (averaging average trust in EU institutions and national institutions); and *noise pollution* with *pollution, grime or other environmental problems* in the domain of natural and living environment.

Wellbeing today

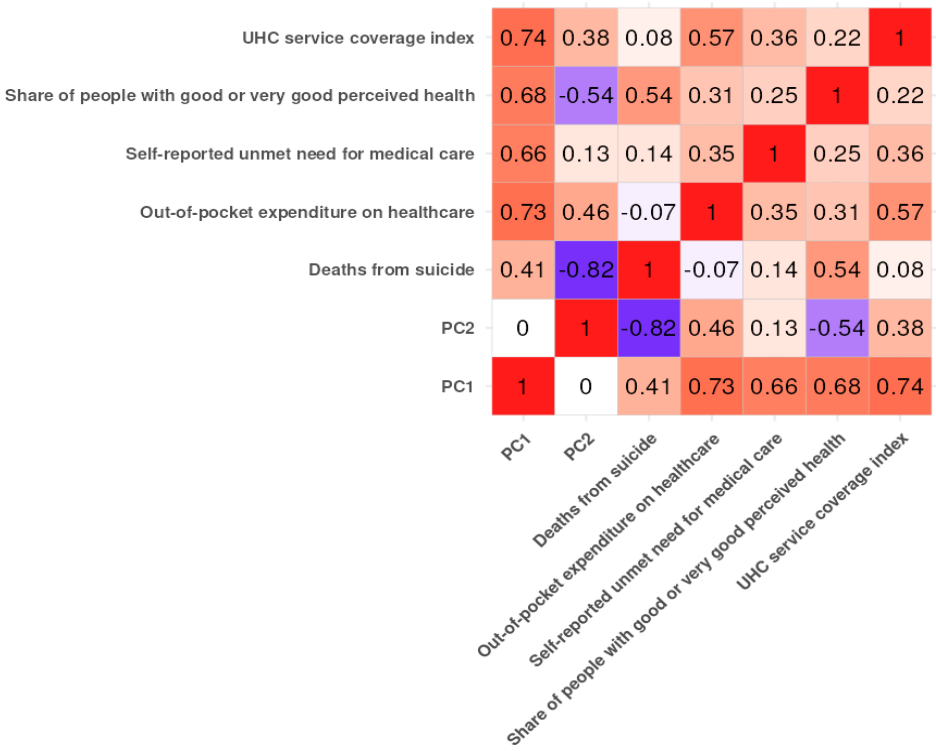
1. Material living conditions and economic security



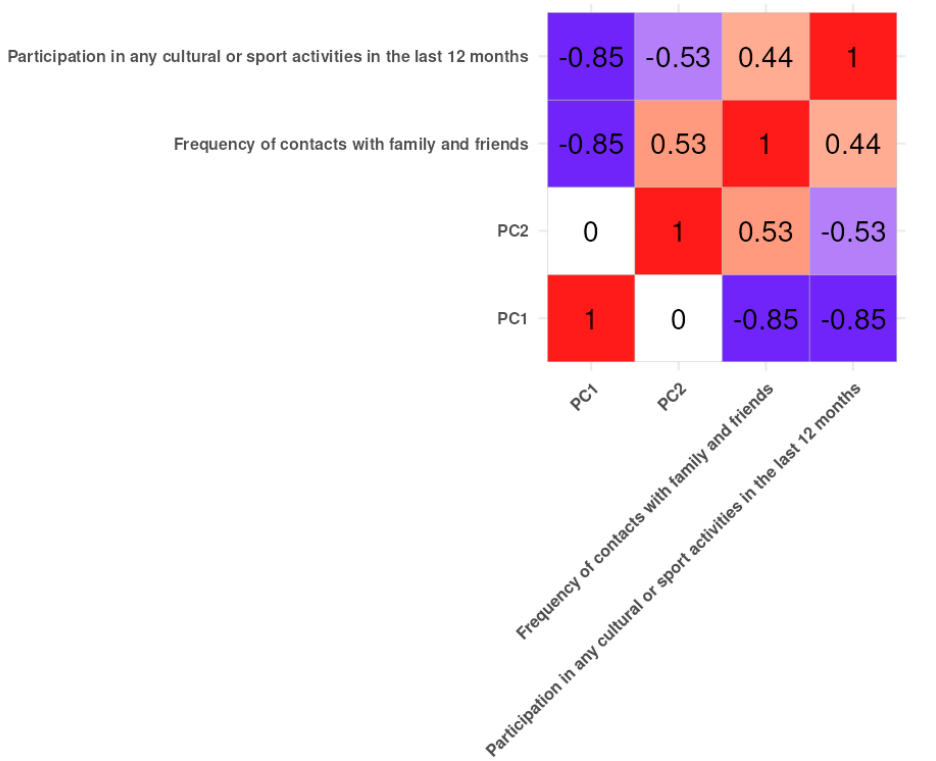
2. Productive and other main activity



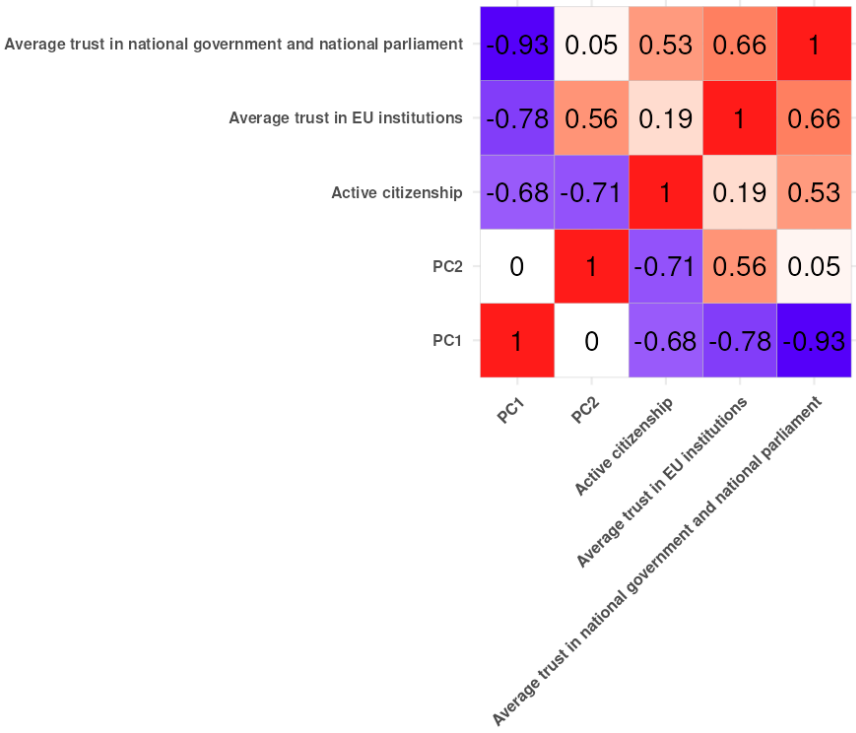
3. Health



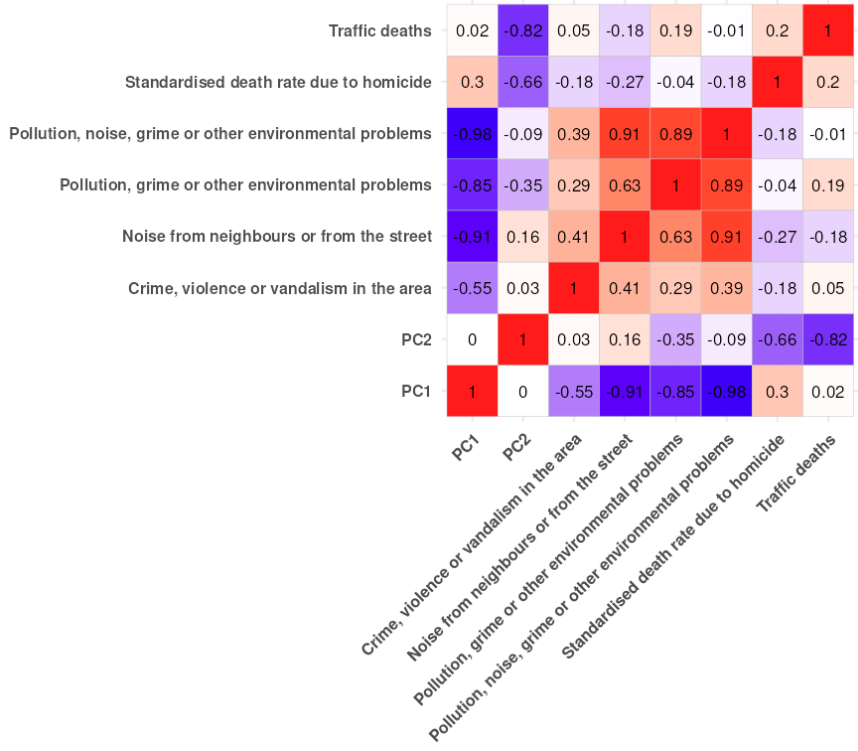
4. Leisure and social interactions



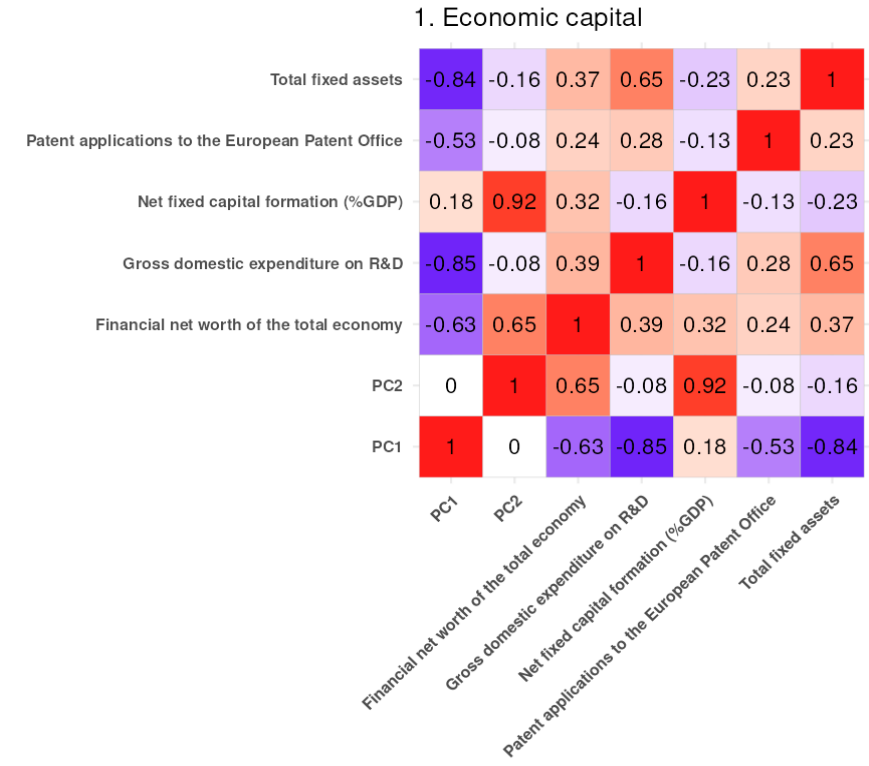
5. Governance and basic rights

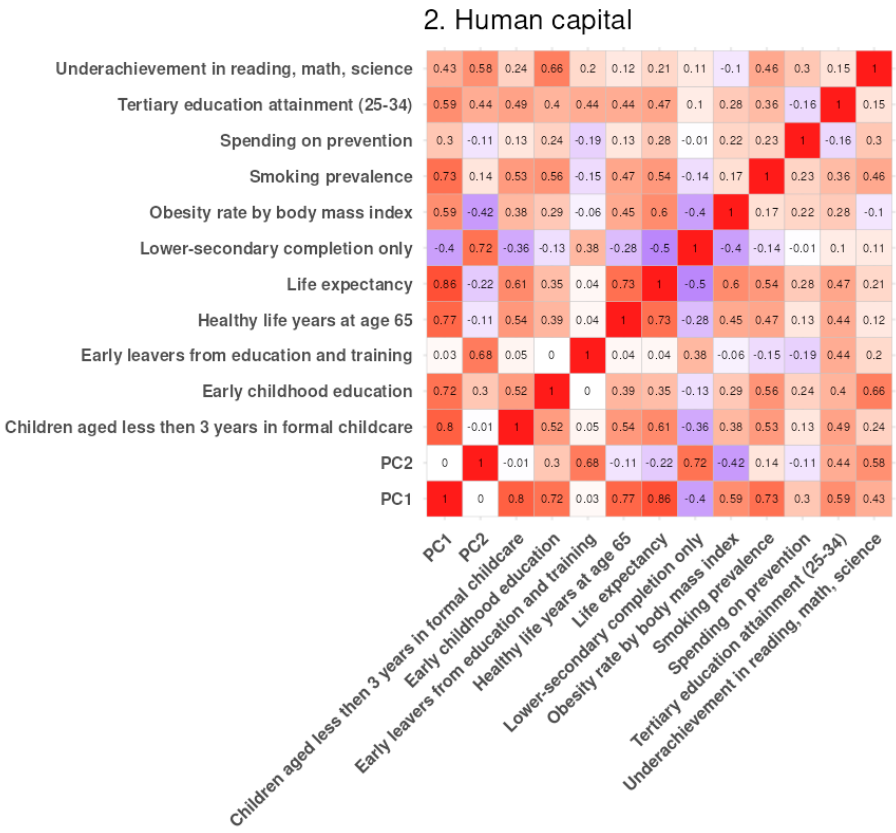


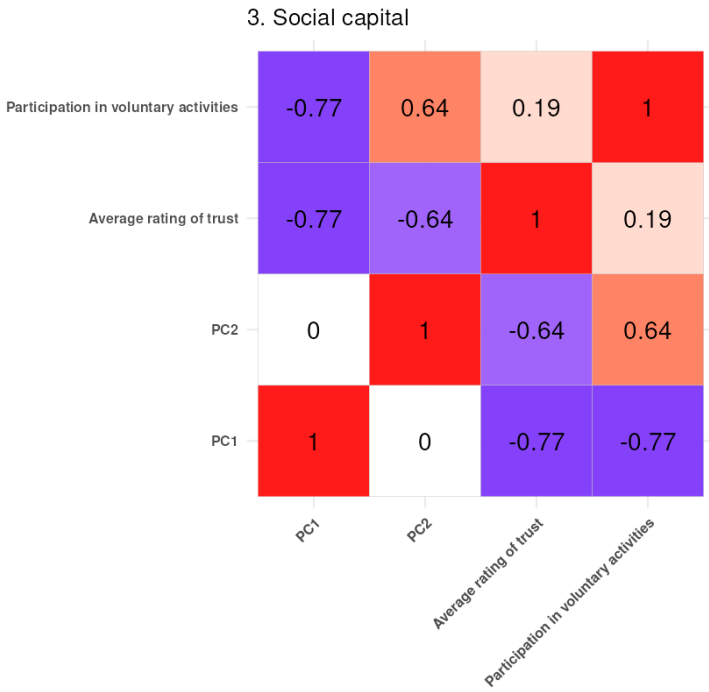
6. Natural and living environment



Social and economic resources for future wellbeing

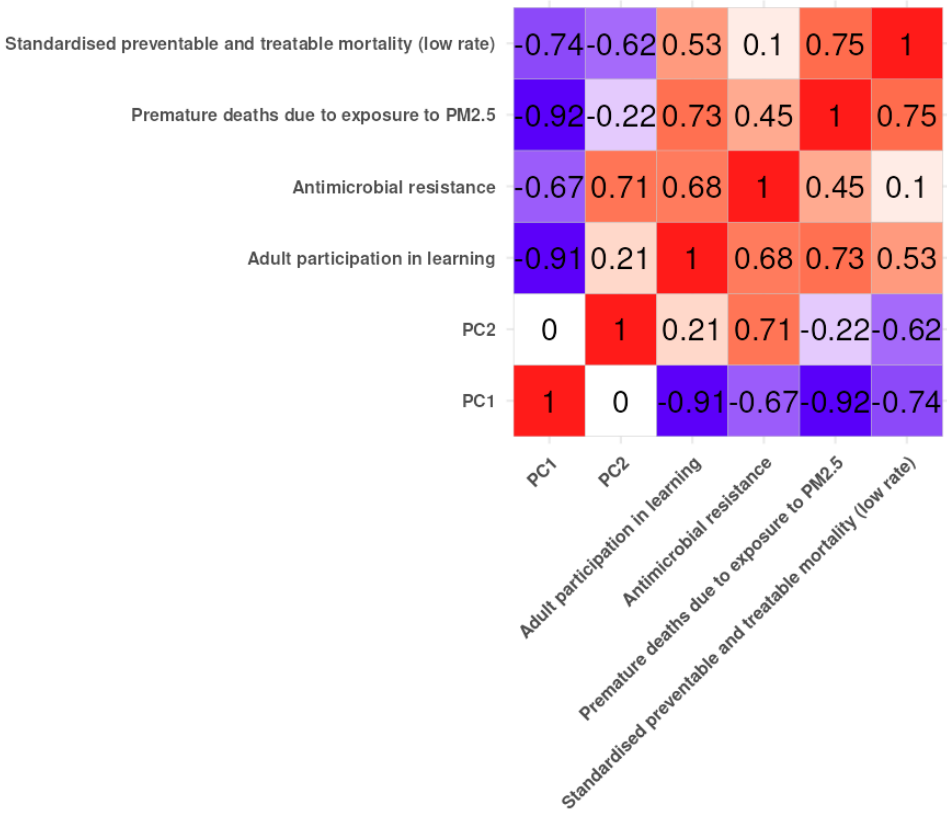




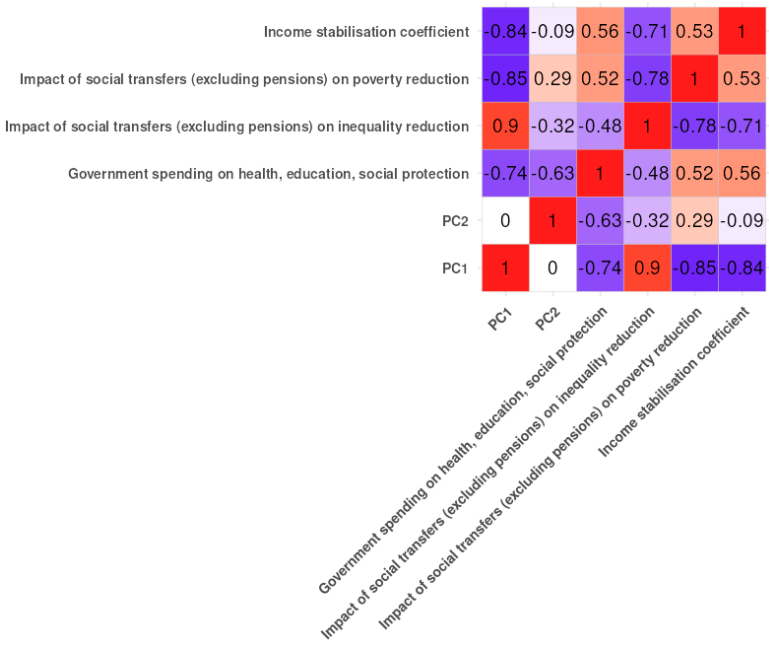


Resilience: Societal challenges and sustainability transitions

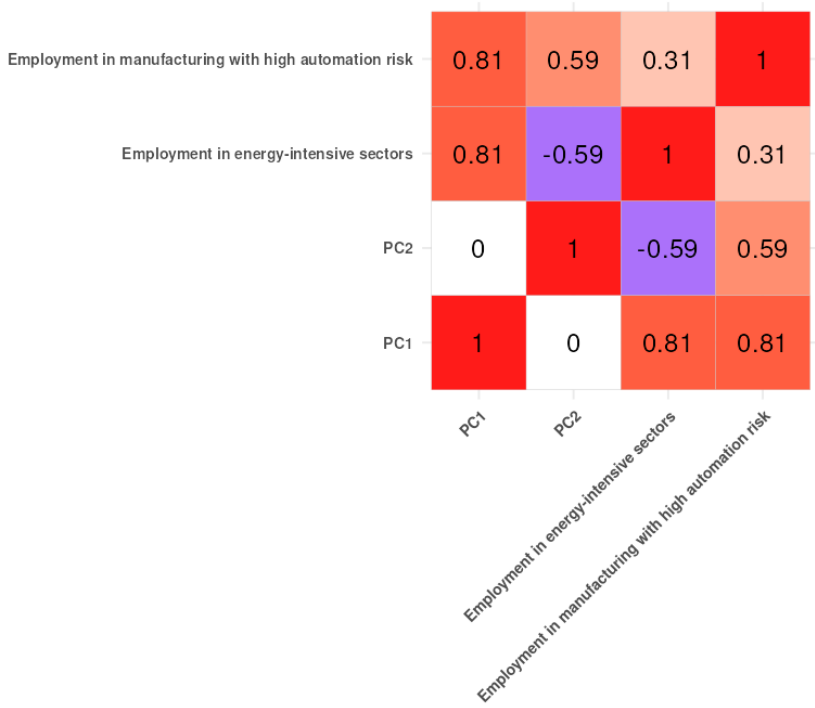
1.2. Education and health resilience



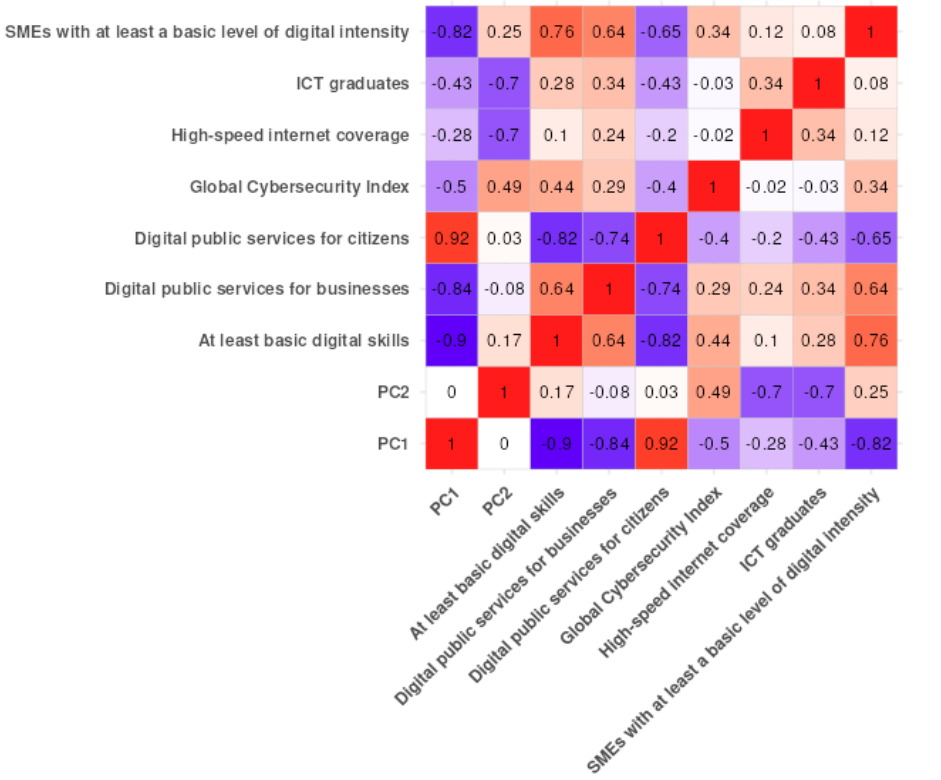
1.3. Policies to facilitate transitions and decrease the vulnerabilities



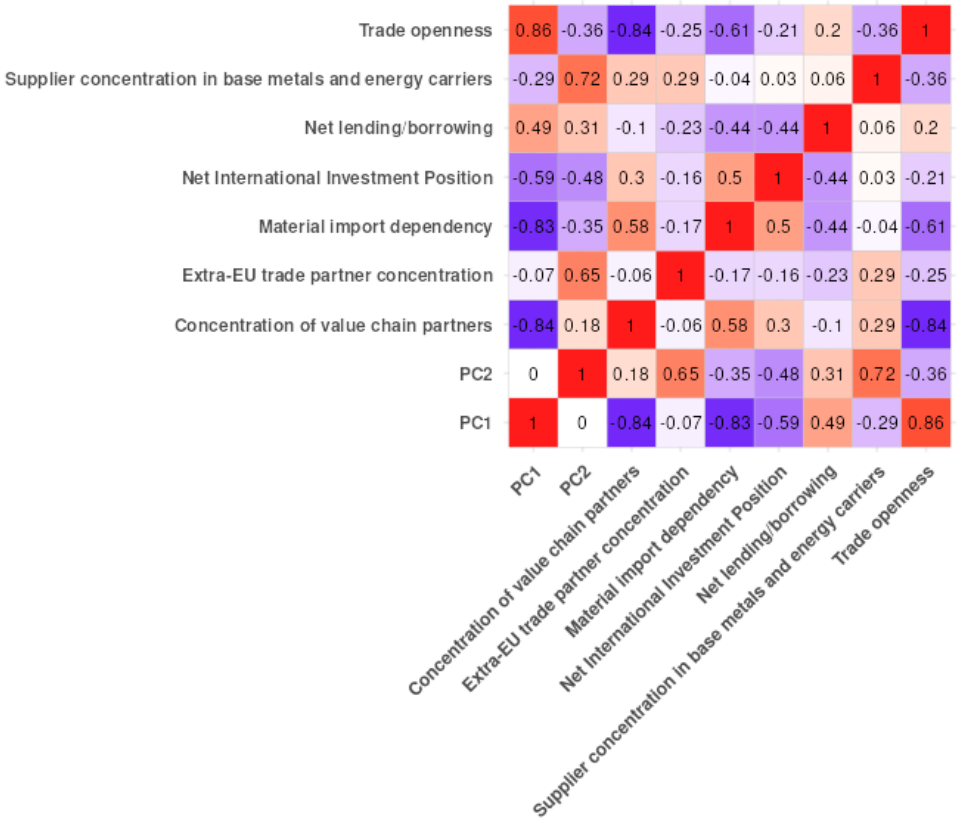
1.4. Social impact of transitions



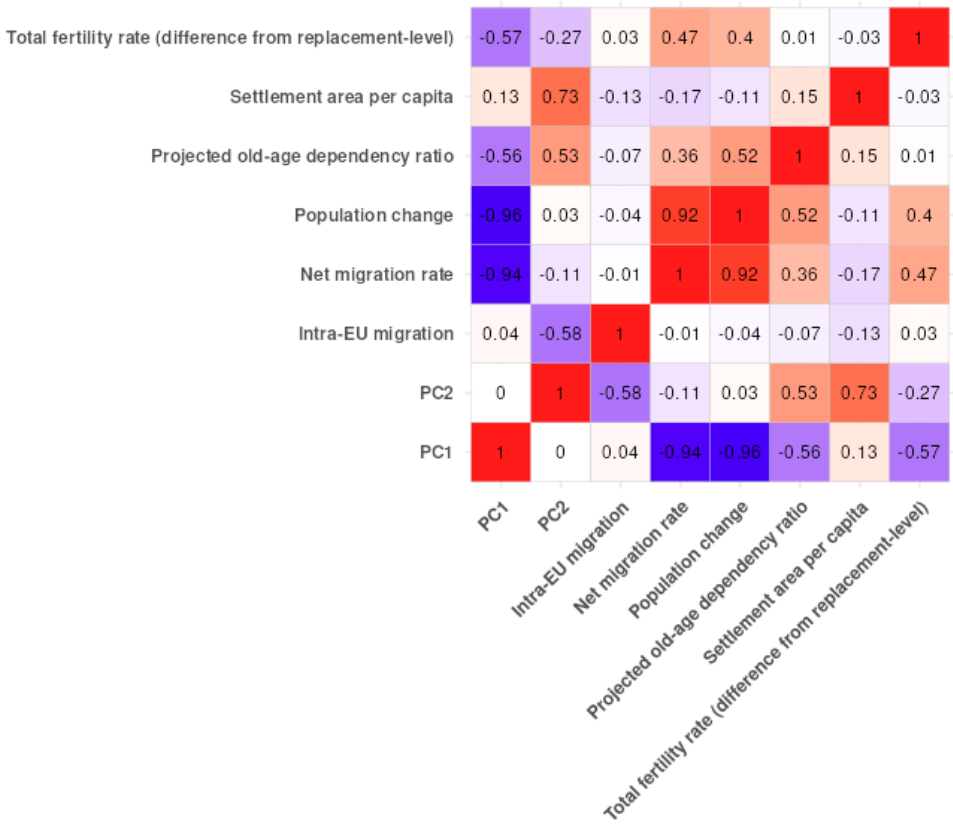
2. Digitalisation and technological change



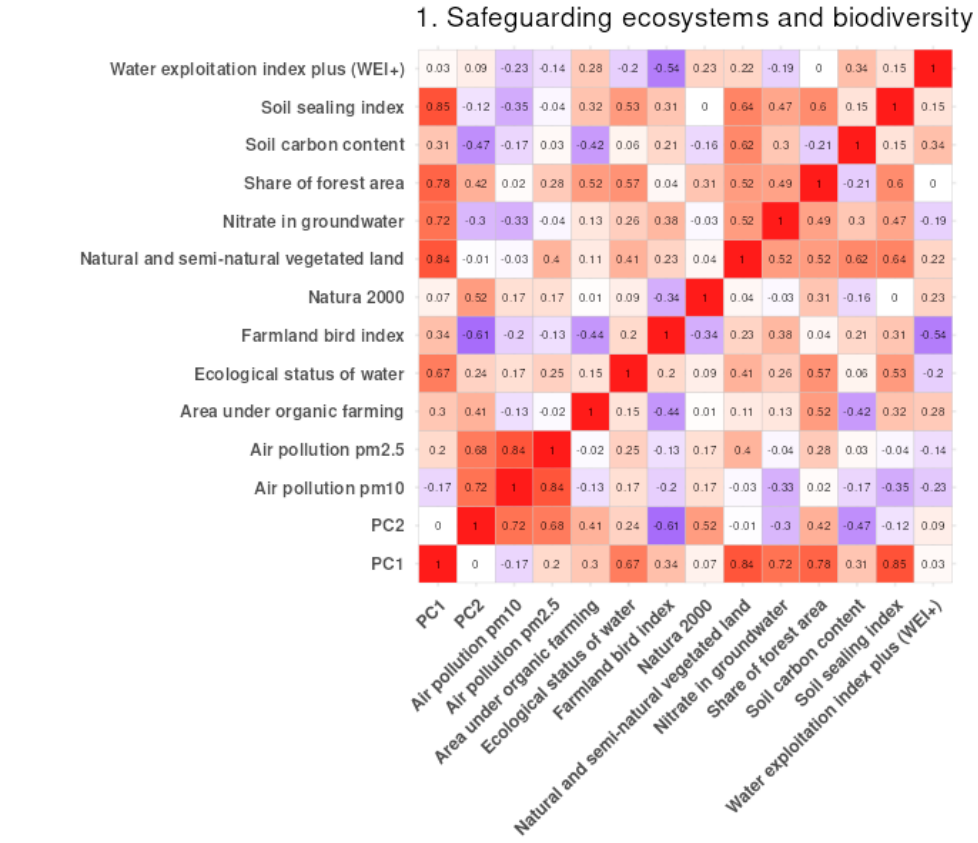
3. Geopolitical resilience

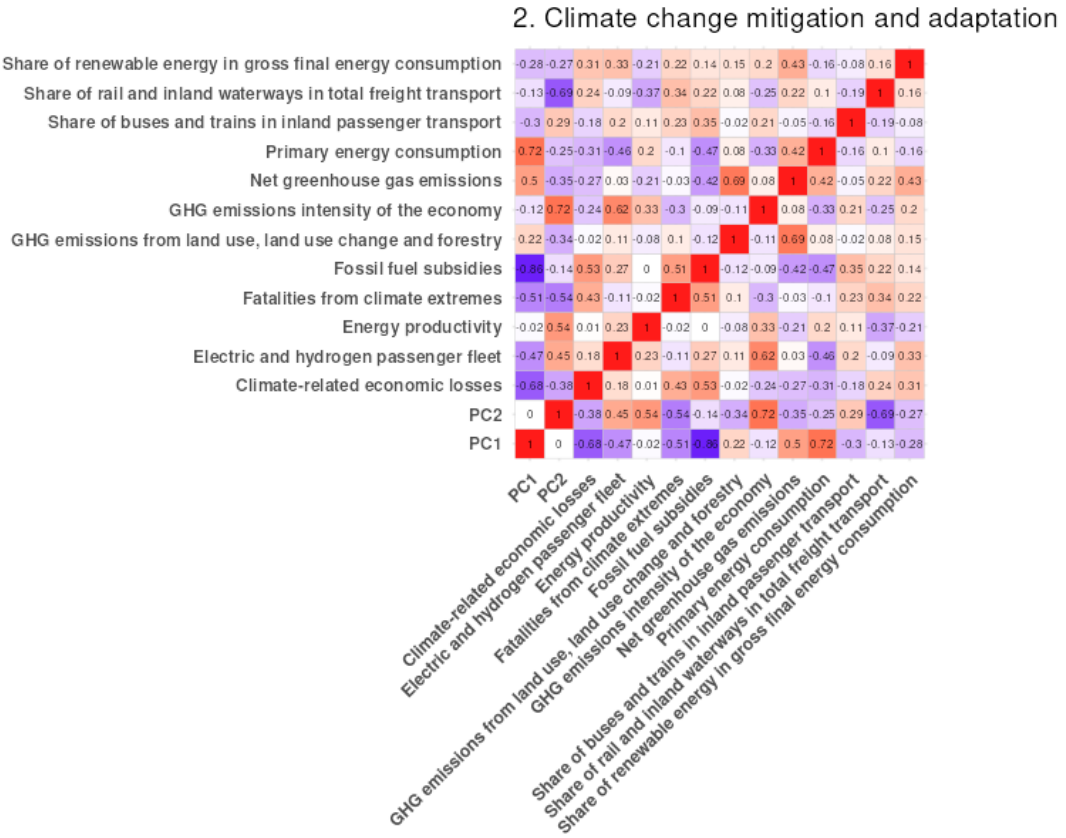


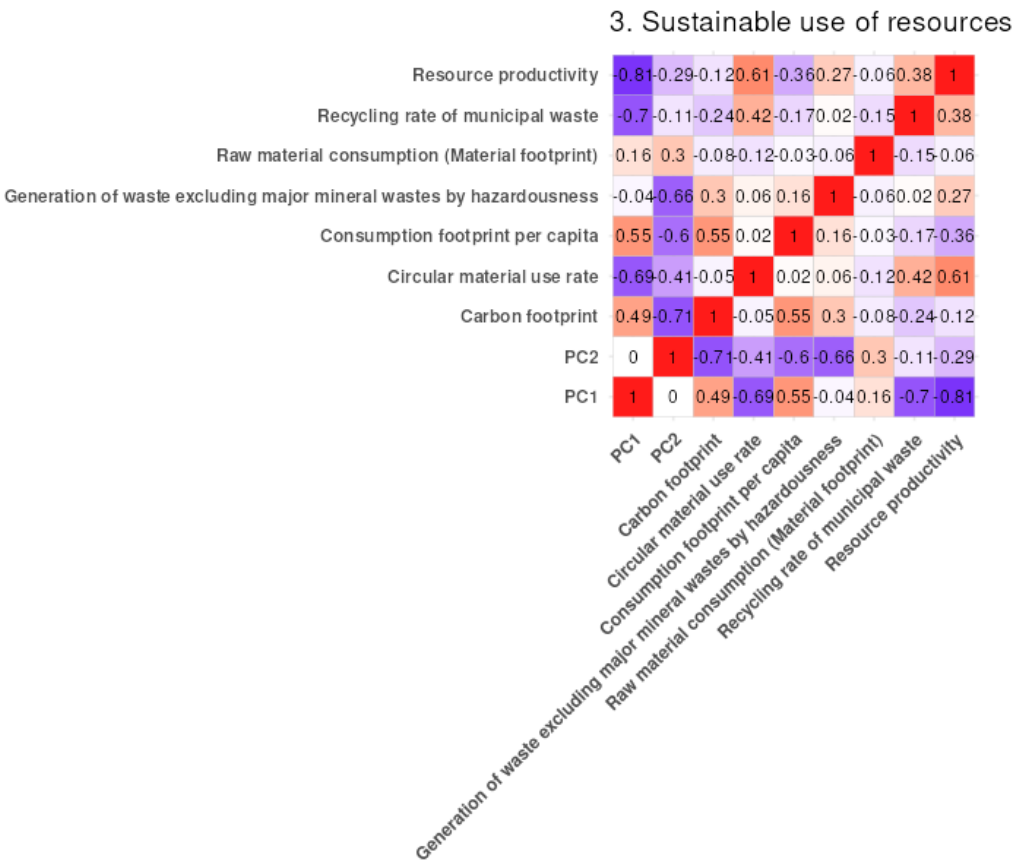
4. Demography and urbanisation

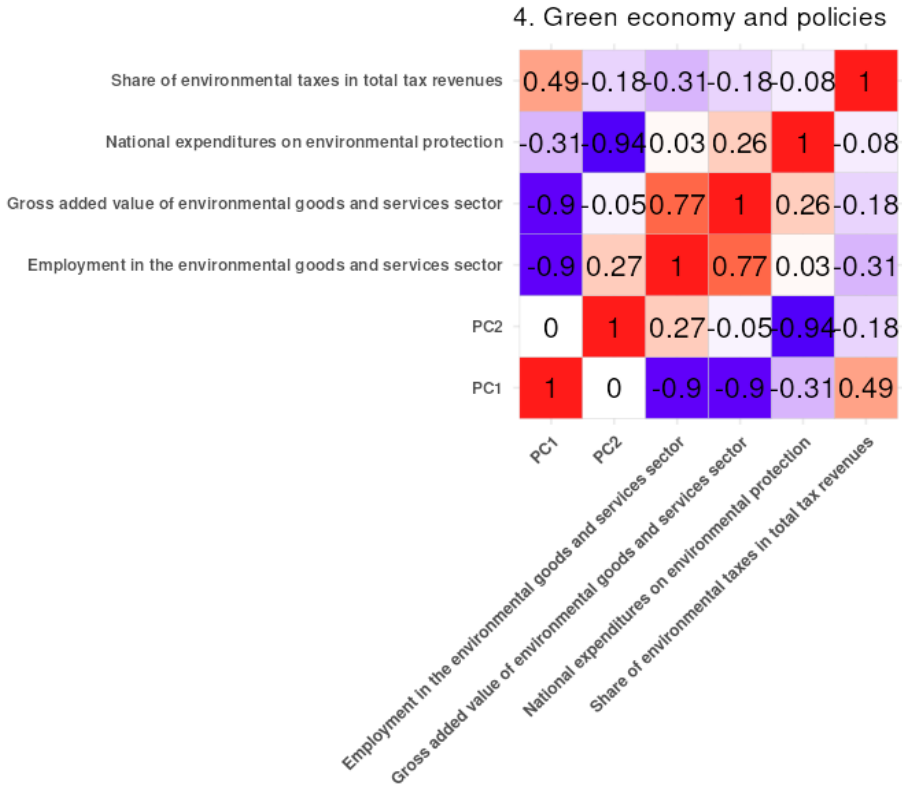


Nature and planetary boundaries

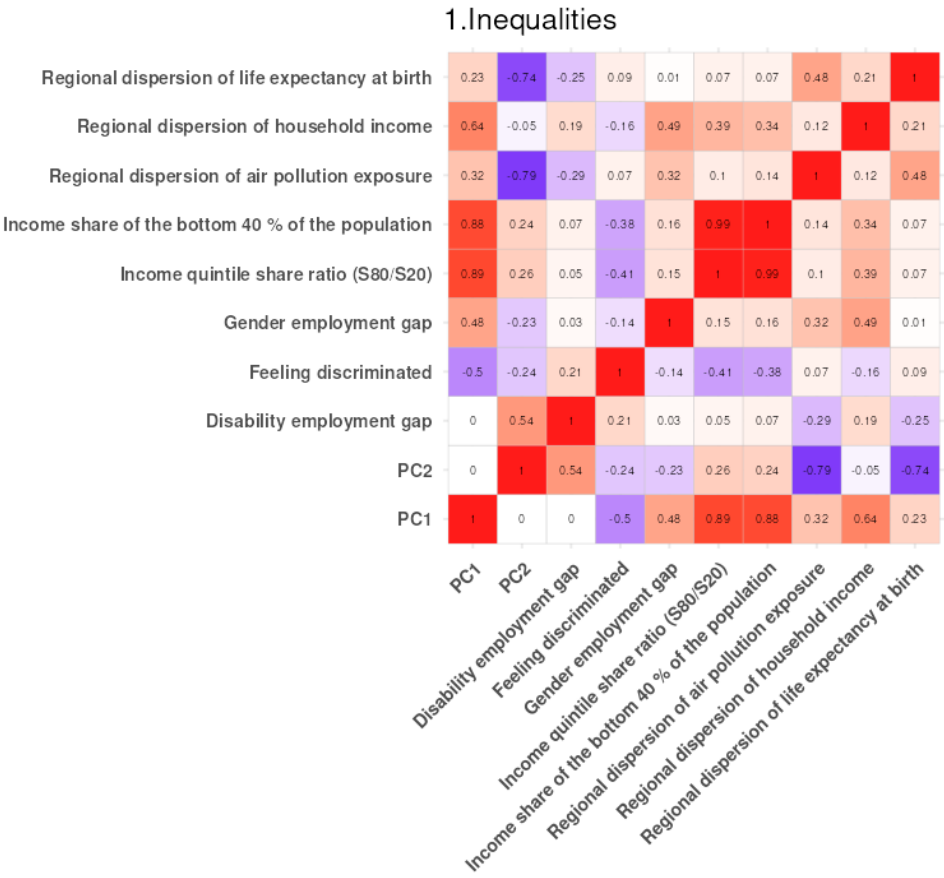





3. Sustainable use of resources
Resource productivity
Recycling rate of municipal waste
Raw material consumption (Material footprint)
Generation of waste excluding major mineral wastes by hazardousness
Consumption footprint per capita
Circular material use rate
Carbon footprint
PC2
PC1
-0.81 -0.29 -0.12 0.61 -0.36 0.27 -0.06 0.38 1
-0.7 -0.11 -0.24 0.42 -0.17 0.02 -0.15 1 0.38
0.16 0.3 -0.08 -0.12 -0.03 -0.06 1 -0.15 -0.06
-0.04 0.66 0.3 0.06 0.16 1 -0.06 0.02 0.27
0.55 -0.6 0.55 0.02 1 0.16 -0.03 -0.17 -0.36
-0.69 -0.41 -0.05 1 0.02 0.06 -0.12 0.42 0.61
0.49 -0.71 1 -0.05 0.55 0.3 -0.08 -0.24 -0.12
0 1 -0.71 -0.41 -0.6 -0.66 0.3 -0.11 -0.29
1 0 0.49 -0.69 0.55 -0.04 0.16 -0.7 -0.81
PC1
PC2
Carbon footprint
Circular material use rate
Consumption footprint per capita
Generation of waste excluding major mineral wastes by hazardousness
Raw material consumption (Material footprint)
Recycling rate of municipal waste
Resource productivity


4. Green economy and policies
Share of environmental taxes in total tax revenues
National expenditures on environmental protection
Gross added value of environmental goods and services sector
Employment in the environmental goods and services sector
PC2
PC1
0.49 -0.18 -0.31 -0.18 -0.08 1
-0.31 -0.94 0.03 0.26 1 -0.08
-0.9 -0.05 0.77 1 0.26 -0.18
-0.9 0.27 1 0.77 0.03 -0.31
0 1 0.27 -0.05 -0.94 -0.18
1 0 -0.9 -0.9 -0.31 0.49
PC1
PC2
Employment in the environmental goods and services sector
Gross added value of environmental goods and services sector
National expenditures on environmental protection
Share of environmental taxes in total tax revenues

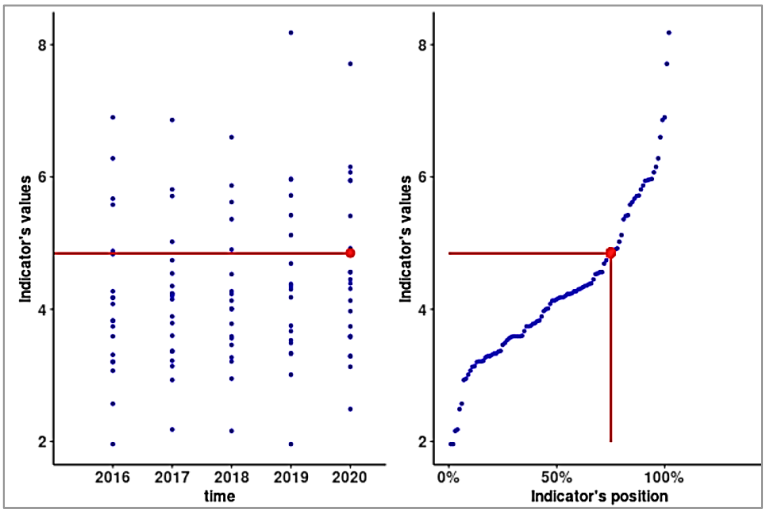
Inclusiveness: inequalities



Annex 8. Methodology – reading the SIWB dashboards

The SIWB dashboards present an assessment of country vulnerabilities and capacities in relative terms. They use a scale of five colours, which indicates each country's relative situation in the latest available year (usually 2021-2022, with exceptions), compared to the collection of values of that indicator for all Member States and all years in the reference period 2011-2022[42].

Figure A8.1. Assessing the position of a country in the reference dataset



Source: authors' calculation.

Figure A8.1 sheds light on the mechanics of the relative assessment approach. Its left panel shows the hypothetical distribution of the values of an indicator across years, all countries. Each dot represents a country. The red dot is the value of the indicator for a specific country in the latest year. The right panel presents the overall distribution of the values of this indicator across countries and years, constructed by pooling together and ordering all values from the left panel. The red dot is the position of the specific country in the latest available year in this distribution. The corresponding value on the horizontal axis is the position used for determining the country's relative situation. A value of 70%, for example, means that exactly 70% of the values in the reference dataset are smaller than the red dot[43].

Indicators that are located in the top 12.5% of the overall distribution (an indicator position above 87.5%) are coloured dark blue; blue indicates countries falling between the top 12.5% and 37.5% (indicator position between 62.5% and 87.5%); dark orange indicates values that are in the bottom 12.5%; orange between the bottom 12.5% and 37.5% of the reference data; light blue is used to indicate values in the middle, falling between the 37.5th and 62.5th percentile of the reference sample.

[42] The choice of this reference period depends on the data coverage and the appropriate amount of data to build a base sample. It represents the longest possible common reference period. One should note that data availability across countries may vary from year to year. For comparability of synthetic indicators over time we impute the missing values when the indicator is not available for a given country in a given year. The imputation process involves carrying forward the most recent available value for an indicator over time until a new value is recorded. In some rare cases, it also involved carrying values backward in time.

[43] If the distribution of one indicator is made of 100 values, then 0.7 means that the country today ranks 70th in this distribution from the bottom

It is important to note that indicators that inversely correlate with wellbeing, such as "deaths from suicide", are assigned a negative sign to ensure that an observed improvement in these indicators, reflected in the synthetic measure, corresponds to a decrease in the underlying undesirable outcome, in this case, a reduction in the number of suicides.

In addition, the dashboards present the corresponding EU-level position for each indicator. EU level values are taken from the same data source as for the Member States, whenever available. If not available, they are calculated as an appropriately weighted average over all Member States, where the weights are chosen to obtain the corresponding EU-level statistical measure for the specific indicator (most frequently GDP or population-based weights, depending on the indicator).

The drawbacks of using synthetic indices

While synthetic indices offer numerous advantages in summarizing complex phenomenon, one of their major drawbacks is that they can obscure the relationships between individual indicators. By aggregating multiple indicators into a single index, the unique contributions and interactions of each indicator can become lost, making it difficult to interpret the results. Additionally, they can mask underlying patterns and relationships in the data.

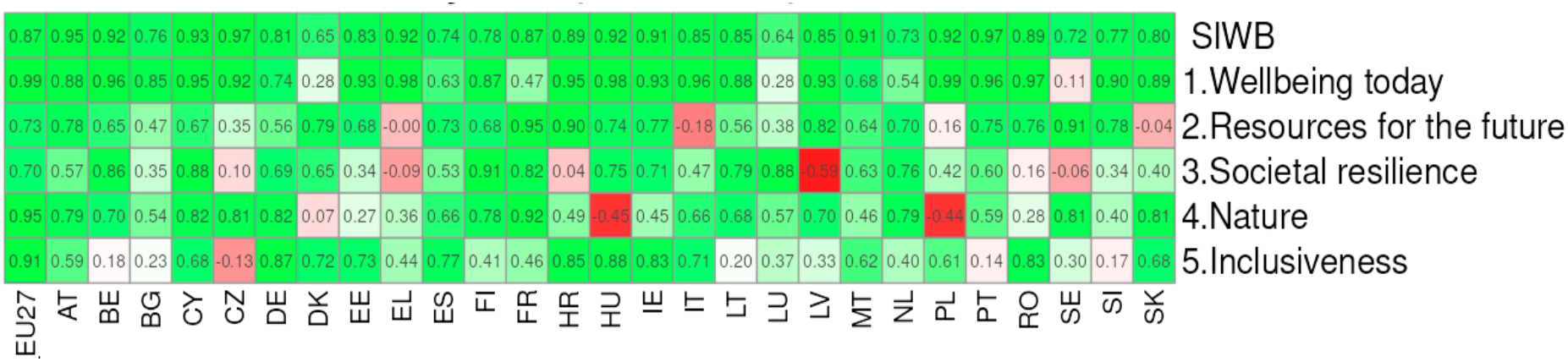
Moreover, composite indices can be sensitive to the choice of indicators, weighting scheme and aggregation method, which can lead to different conclusions depending on the specific approach used. This can make it challenging to compare results across studies or datasets.

Finally, composite indices can limit the ability to analyse and understand the underlying data, when the index itself becomes the focus of analysis rather than the individual indicators. This can lead to a lack of insight into the underlying mechanisms and relationships, making it difficult to identify areas for improvement or intervention. We attempt to overcome this challenge by lending equal attention to the underlying indicators as to the indices themselves. Da Costa (2025) offers a more thorough assessment of the use of composites for the measurement of wellbeing, and also a comparison to preference-based methods.

Annex 9. Correlation analysis of composites based on the 50 and 140 indicators

To understand how much the synthetics based on 50 correlate to those based on 140 indicators, Figure A9.1 presents the correlation between the two versions for the SIWB and all of component indices, per Member State, between 2011 and 2022. The high degree of correlation observed for most components and countries suggests that the choice of the number of indicators has a fairly limited impact on the synthetic indices. Consequently, the 50- and 140-indicator versions of the indices represent the underlying concept very similarly. This is less the case with *resilience* given the broadness of the concept and the heterogeneity of indicators that could potentially be included in this component in either scenario. Though to a bit smaller degree, a similar observation applies to *nature and planetary boundaries.*

Figure A9.1. Correlation between synthetic indicators based on 50 and 140 indicators, SIWB and its components (2011-2022)

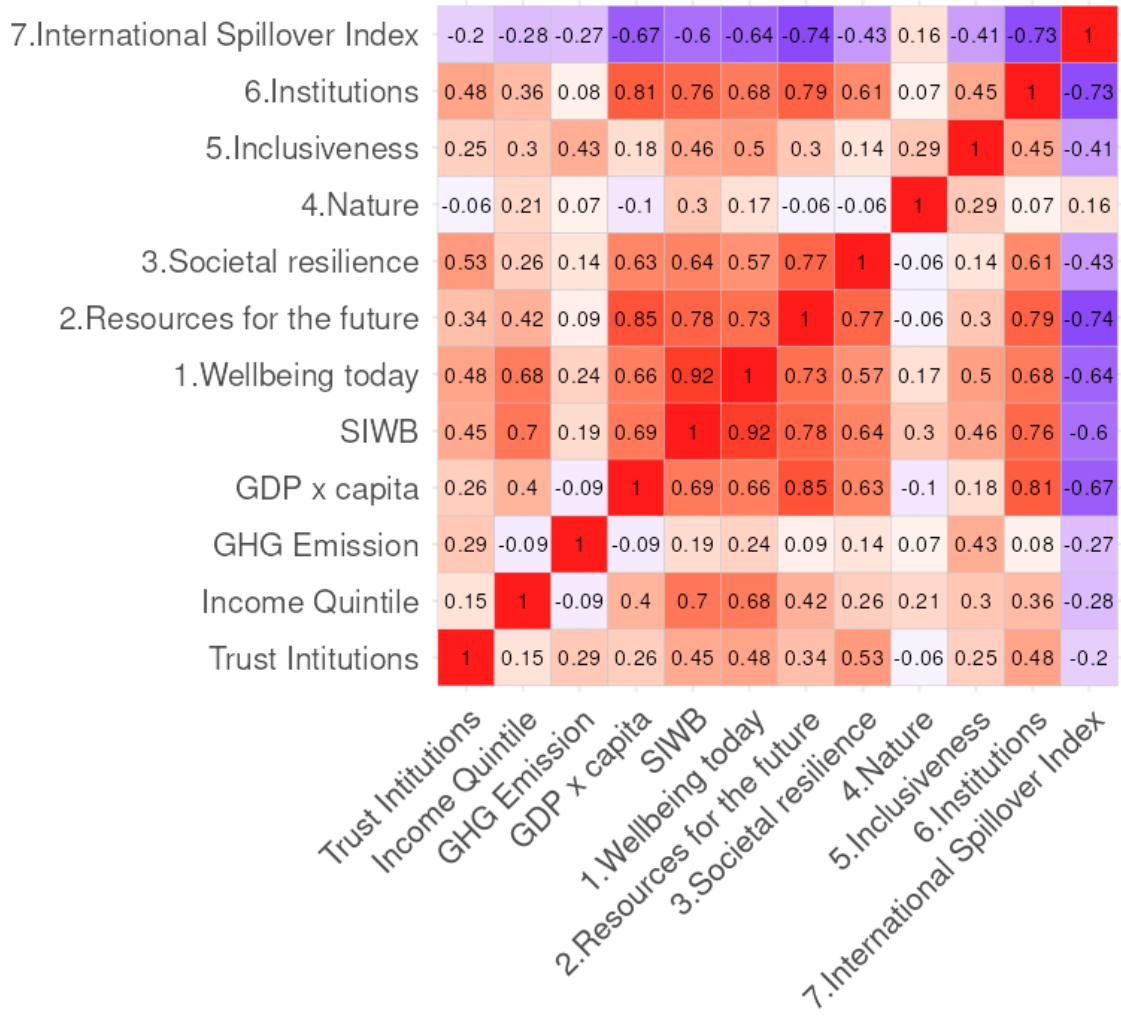


Source: authors' calculation.

Annex 10. Correlation matrices including the alternative scenarios of GDP+3

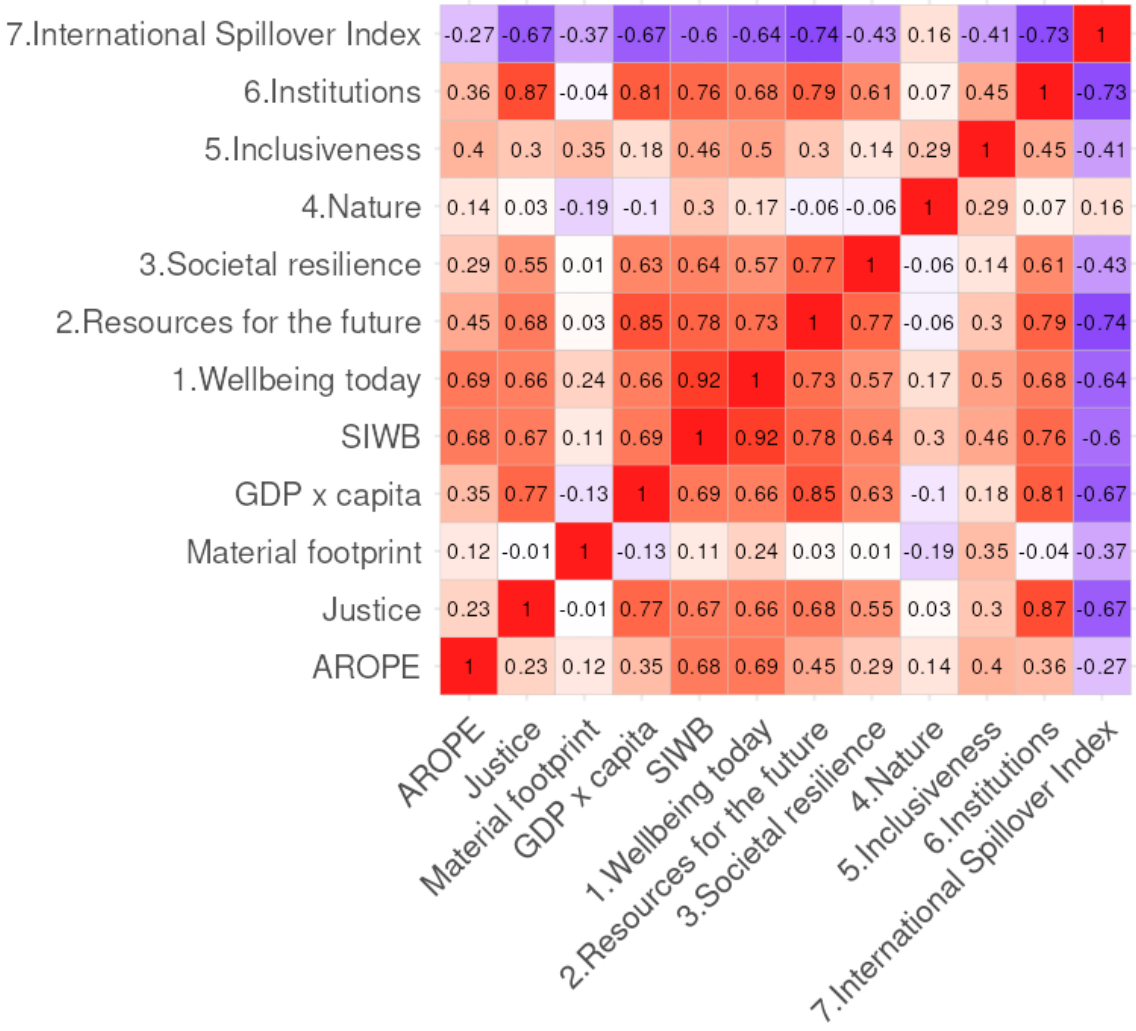
To ensure consistency, we compared the component level synthetic indices with the indicators chosen by DG RTD-funded study "New Metrics for Sustainable Prosperity: Options for GDP+3". The main report presented the correlation matrix for the 'Better Life' scenario of the GDP+3 indicators. This Annex shows matrices for the other two scenarios 'Leaving no one behind', that considers GHG emissions, the income quintile share ratio (S80/S20), and rust in institutions; and 'Make poverty history', that considers the material footprint, AROPE, and the perceived independence of the justice system.

'Leaving no one behind'



Source: authors' calculation.

‘Make poverty history’

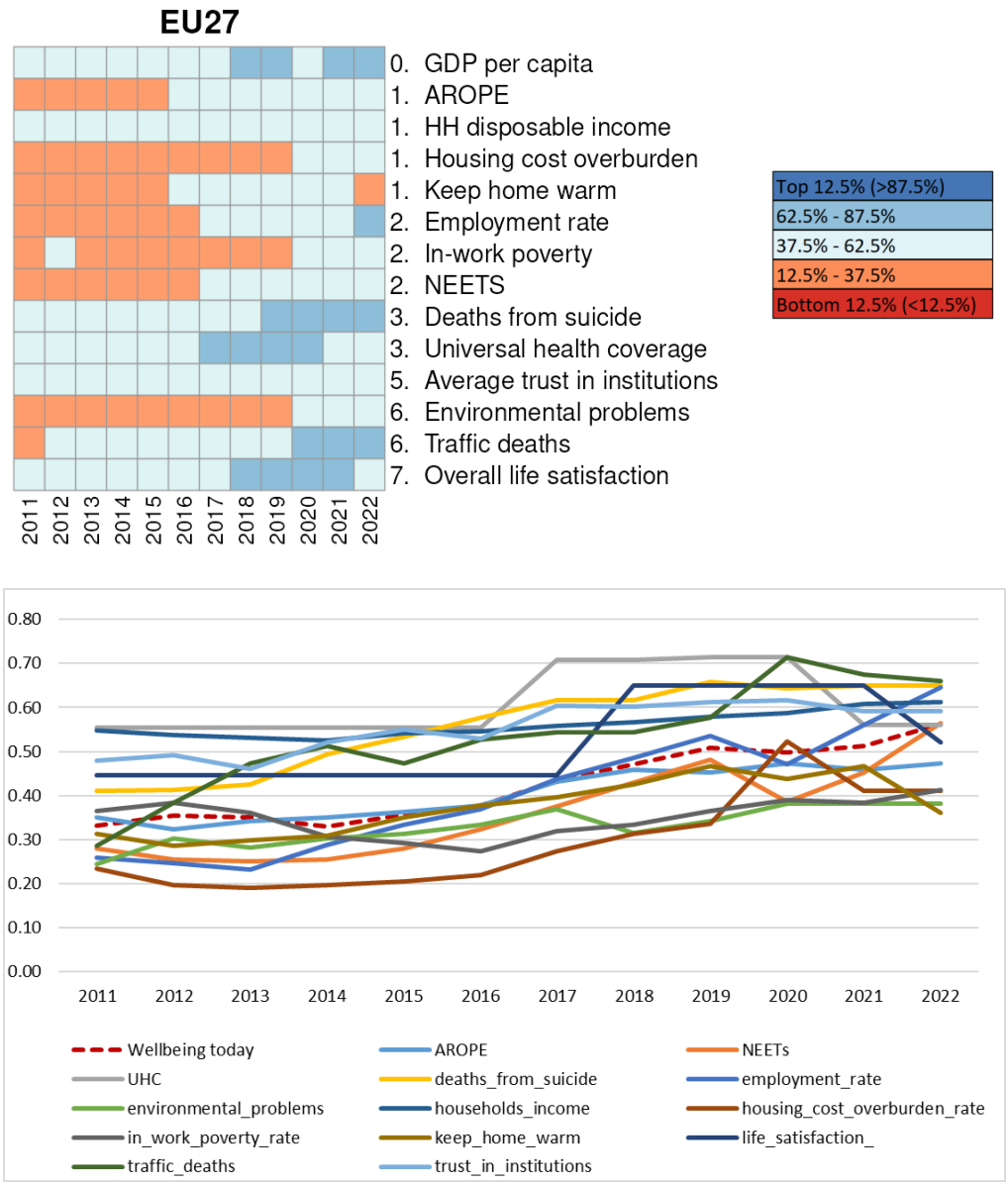


Source: authors’ calculation.

Annex 11: Time trends of indicators

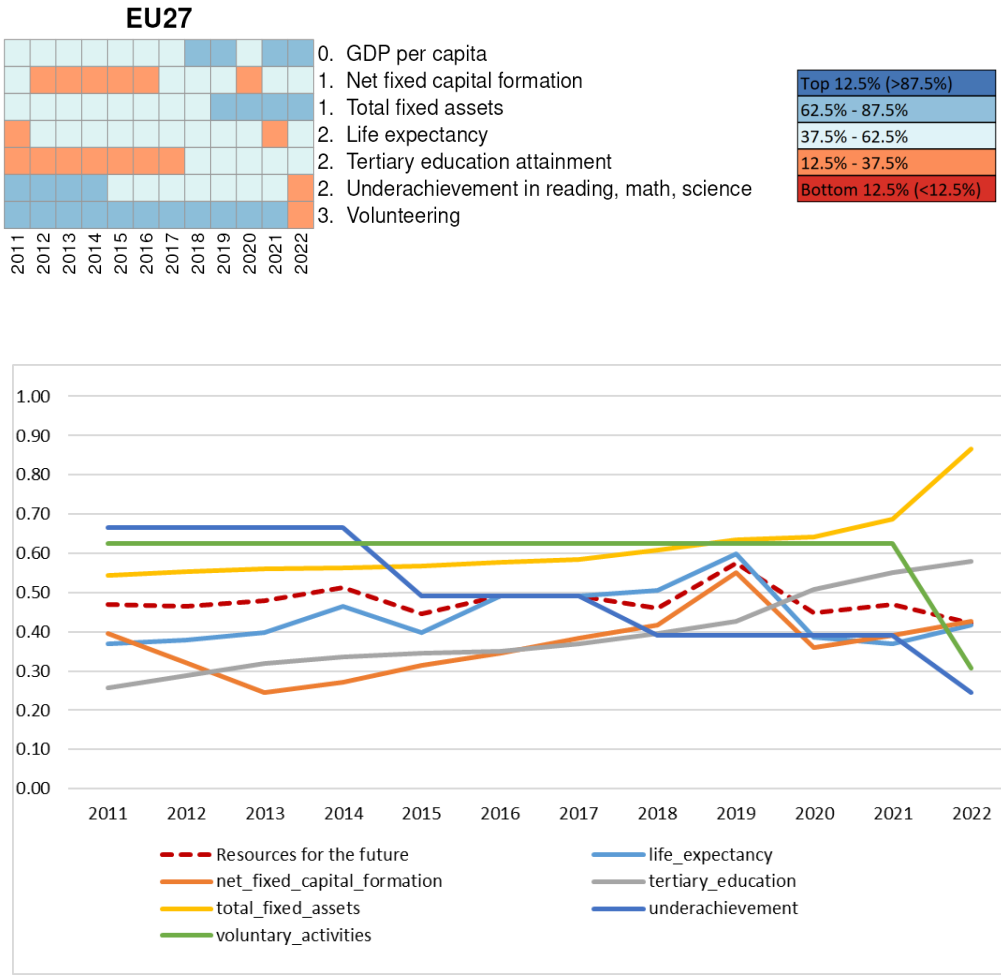
This Annex presents the underlying analysis of trends at the level of indicators referred to in Section 8. The indicator for international spillovers is omitted, as the data is available only for 2022.

Figure A11.1. Wellbeing today: indicator positions and trends from 2011 to 2022



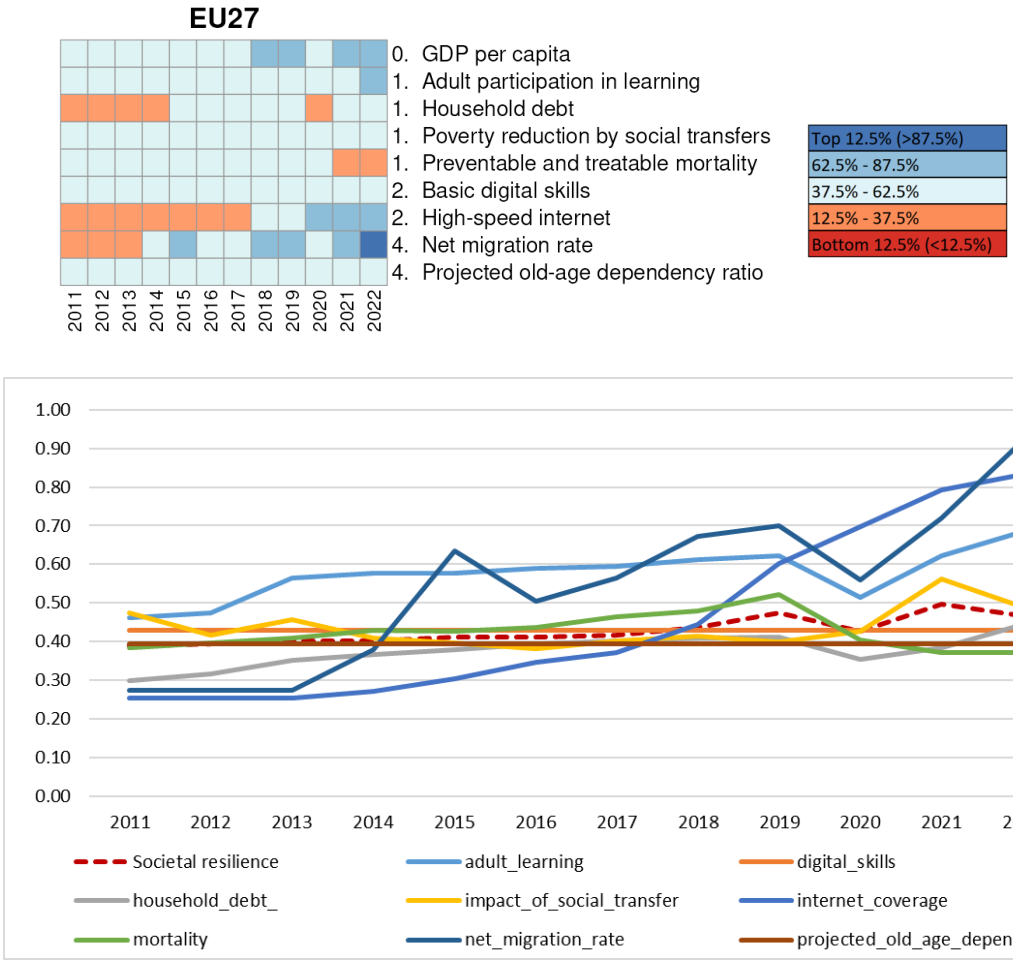
Note: Frequency of social interactions is omitted since there are no values for the EU.
Source: authors' calculation.

Figure A11.2. Resources for the future: indicator positions and trends from 2011 to 2022



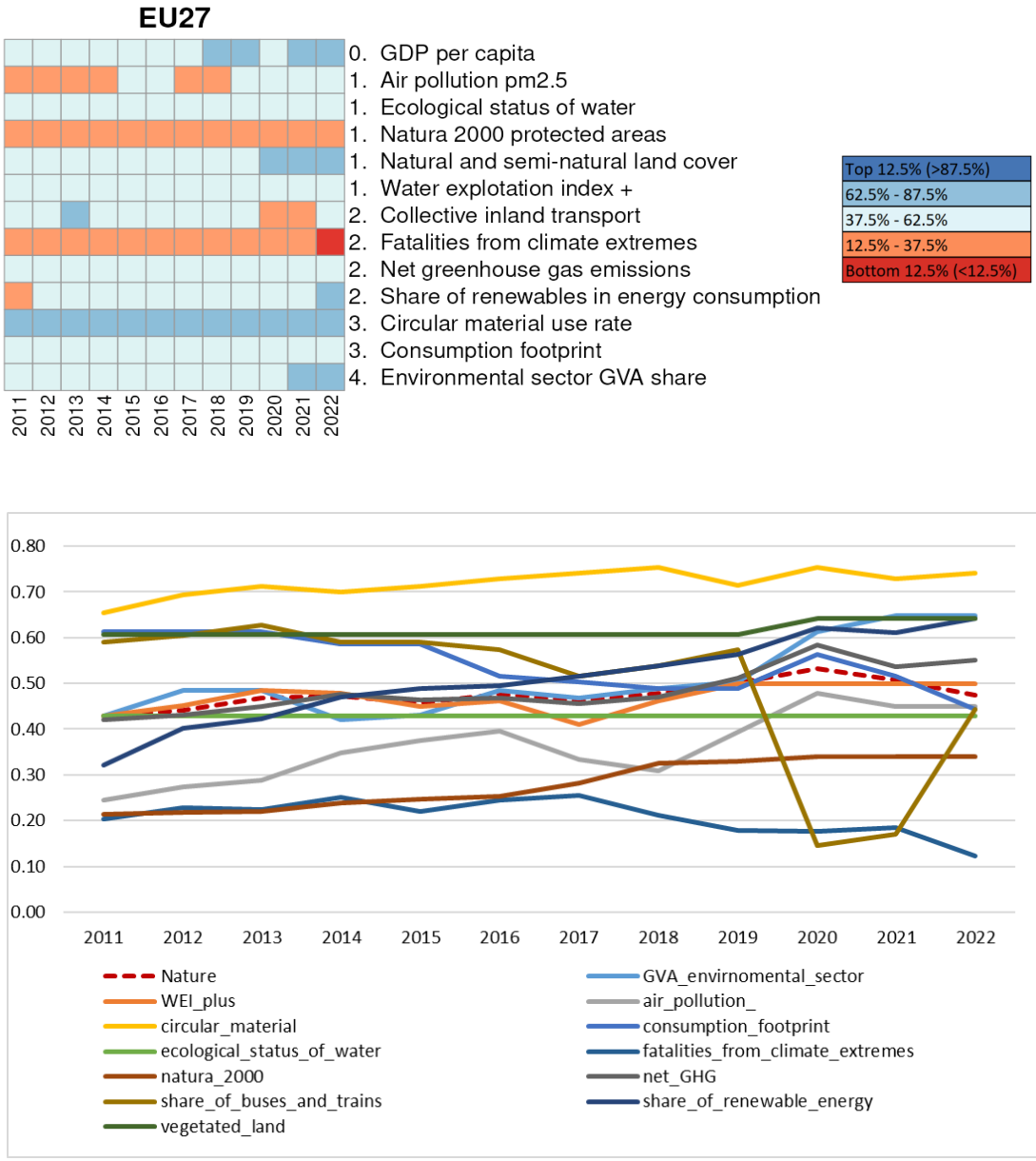
Source: authors' calculation.

Figure A11.3. Resilience: indicator positions and trends from 2011 to 2022



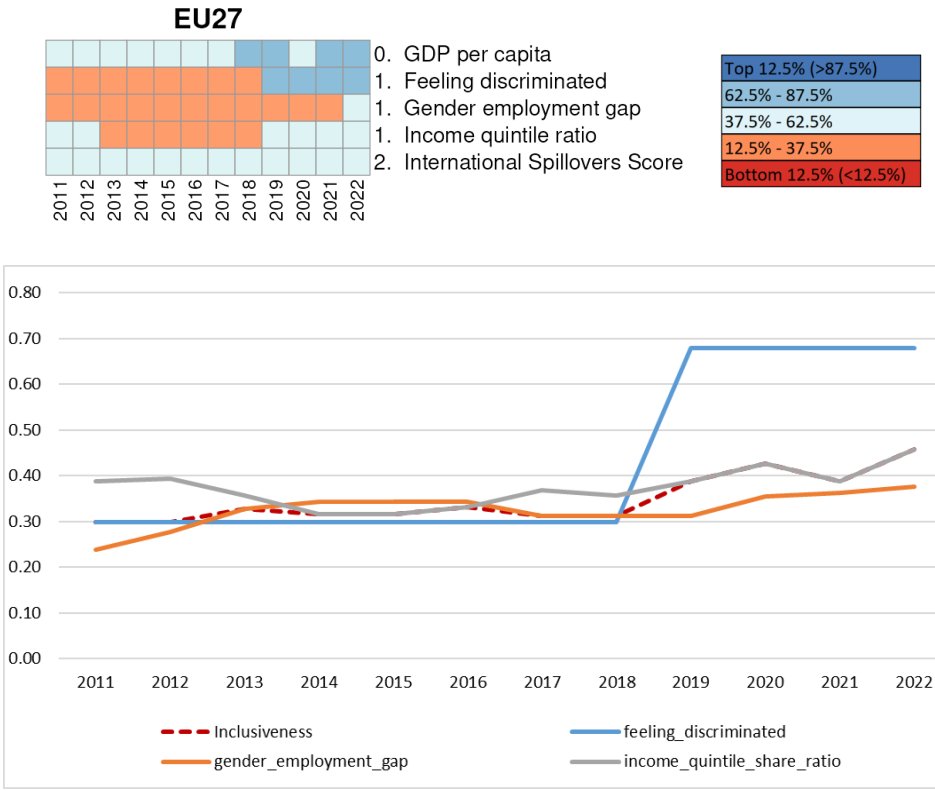
Note: Concentration of value chain partners, net international Investment position and material import dependency are omitted, since there are no (meaningful) values for the EU.
Source: authors' calculation.

Figure A11.4. Nature and planetary boundaries: indicator positions and trends from 2011 to 2022



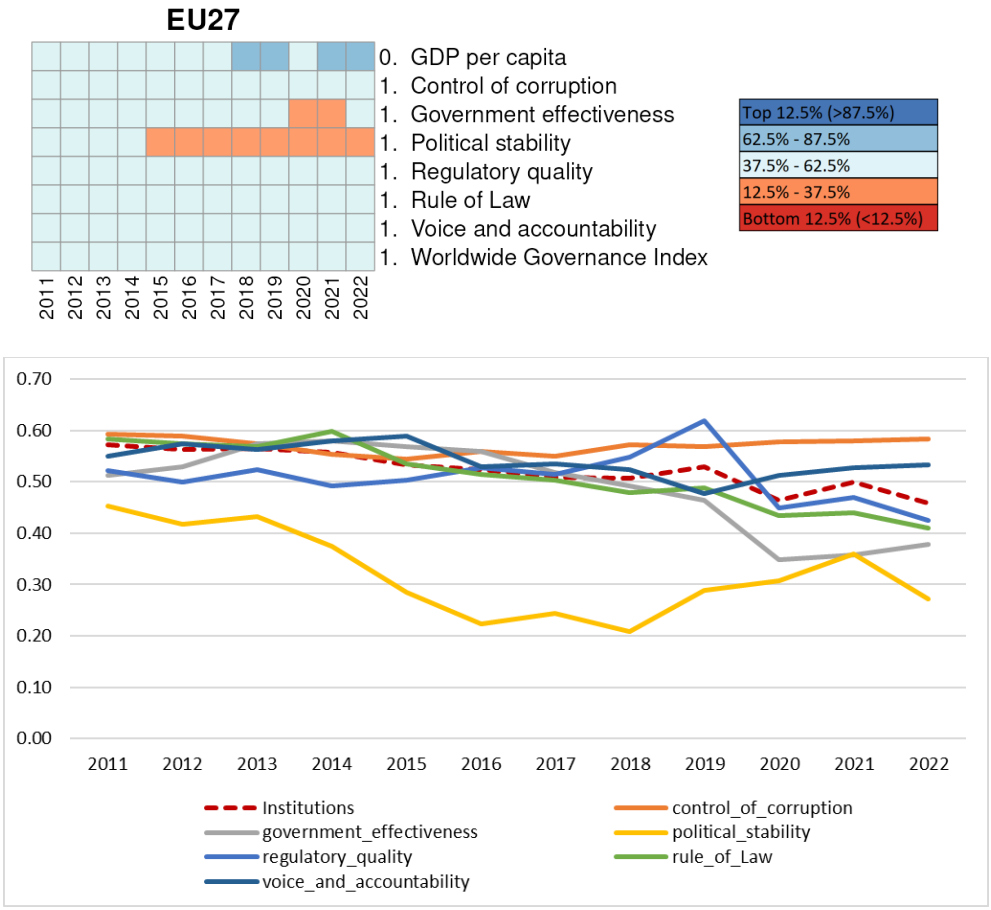
Note: Farmland bird index is omitted as there is no EU value for this indicator
Source: authors' calculation.

Figure A11.5. Inclusiveness: indicator positions and trends from 2011 to 2022



Note: Regional dispersion of life expectancy is omitted as there is no EU value for this indicator.
Source: authors' calculation.

Figure A11.6. Institutional quality: indicator positions and trends from 2011 to 2022



Source: authors' calculation.

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