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EUROPEAN COMMISSION

**RESILIENCE DASHBOARDS FOR THE SOCIAL AND ECONOMIC, GREEN,
DIGITAL, AND GEOPOLITICAL DIMENSIONS¹**

DRAFT

¹ The Commission welcomes comments and inputs on the resilience dashboards, to be sent to this functional mailbox: jrc-resilience@ec.europa.eu

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EXECUTIVE SUMMARY

This report presents the resilience dashboards developed by the European Commission in a process of collective intelligence with Member States and other relevant stakeholders, as a follow up to the 2020 Strategic Foresight Report². **The resilience dashboards** represent an innovative **monitoring tool** for the transition-led EU policy agenda. They provide a **holistic assessment of the ability to progress amidst challenges**, across four dimensions: social and economic, green, digital, and geopolitical.

The resilience dashboards are part of the Commission's effort to **embed strategic foresight into policymaking**, as the selection of the indicators takes a forward-looking perspective. Shedding light on important ingredients for successful transitions and coping with shocks, the dashboards **contribute to an integrated approach for measuring people's wellbeing beyond GDP**.

The dashboards contain a **battery of quantitative indicators from publicly available data sources**, depicting **vulnerabilities** (features that can exacerbate the negative impact of crises and transitions, or obstacles that may hinder the achievement of long-term strategic goals) and **capacities** (enablers or abilities to cope with crises and structural changes and to manage the transitions.). They are developed to help Member States self-assess and identify areas for action and further analysis. The dashboards follow a relative assessment approach and do not aim to rank countries. They also **cover a number of non-EU countries**, to assess the resilience of the EU as a whole compared to other countries. The resilience dashboards will be **regularly updated and reviewed in a collaborative manner**.

The dashboards are complemented by **synthetic resilience indices**, which illustrate the overall relative situation of vulnerabilities and resilience capacities along each of the four dimensions and their underlying areas (see **Figure 1** for the Member State and **Figure 2** for the global level). While allowing for a useful overview, these synthetic measures do not convey the complete information provided by the full set of indicators in the dashboards.

Figure 1 shows that for some Member States, the overall situation is fairly similar across all dimensions, both for vulnerabilities and capacities. In some other cases, the situation is rather different between vulnerabilities and capacities, but is still relatively homogenous within these two classes. Finally, there are many countries where the situation varies heavily across dimensions, going from high capacities (low vulnerabilities) to high vulnerabilities (low capacities).

Figure 2 displays the synthetic resilience indices across the four dimensions for the EU in comparison to other major global actors. The Union as a whole shows robust capacities in almost all areas, while the situation as regards vulnerabilities can still be improved.

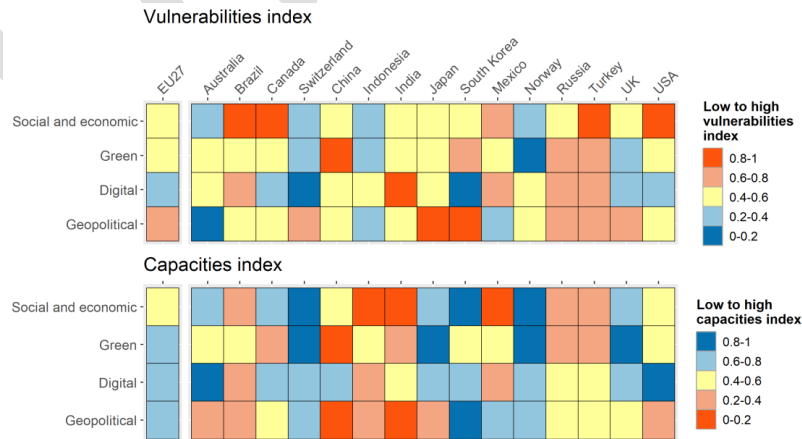
² COM(2020) 493 final (https://ec.europa.eu/info/sites/info/files/strategic_foresight_report_2020_1.pdf)

Figure 1: Resilience of EU Member States, across all areas and dimensions.



The synthetic indices aggregate the relative situation of countries across all considered indicators. A higher vulnerabilities index indicates higher vulnerabilities (from blue to dark orange), while a higher capacities index indicates higher capacities (from dark orange to blue), compared to other countries.

Figure 2: Resilience of the EU in an international comparison, across all dimensions.



The synthetic indices aggregate the relative situation of countries across all considered indicators. A higher vulnerabilities index indicates higher vulnerabilities (from blue to dark orange), while a higher capacities index indicates higher capacities (from dark orange to blue), compared to other countries.

1. INTRODUCTION

The 2020 Strategic Foresight Report (SFR) presents the European Commission’s strategy to embed strategic foresight into European Union policymaking. It identifies the first lessons from the COVID-19 crisis, introduces resilience as a new compass for EU policymaking and discusses the role of strategic foresight in strengthening the resilience of the EU and its Member States, ensuring that short-term initiatives are grounded in a longer-term perspective.

The Communication defines resilience as *the ability not only to withstand and cope with challenges but also to undergo transitions in a sustainable, fair, and democratic manner*, establishing a clear link between the concept of resilience and ongoing societal transformations³. It analyses resilience along four interrelated dimensions – social and economic, green, digital, and geopolitical – and explains its importance for achieving long-term strategic objectives in the context of the transition-led Commission agenda, while maintaining the EU’s core purpose and integrity in a dynamic and, at times, turbulent environment.

In a multipolar, hyperconnected and contested global order, the EU aims to strengthen its responsible global leadership and partnerships, defending its core values and strategic interests, and persuade the international community towards common goals at the benefit of the entire globe⁴. In this context, strengthening the resilience of each Member State is not only beneficial at the national level, but it also contributes to achieving the resilience of the EU as a whole. This is particularly true for many current and future challenges such as potential supply shocks, climate change, migration challenges, health crises or cyber-threats.

This new focus on resilience calls for close monitoring. The 2020 SFR proposed prototype resilience dashboards aimed to assess the vulnerabilities and capacities of the EU and its Member States in each of the four dimensions, taking a forward-looking perspective informed by strategic foresight. Based on the first prototypes, the 2020 SFR announced further work towards developing fully-fledged resilience dashboards in a collaborative process involving Member States and other key stakeholders.

This document presents these new resilience dashboards. The purpose of the dashboards is to take a forward-looking perspective informed by strategic foresight, complementing existing policy coordination instruments and monitoring tools. They are the result of a collaborative process, to which all Commission services have contributed. Work took place in four dedicated Working Groups, with representatives of all relevant services, the EEAS, and the European Environmental Agency. This has ensured that the dashboards are designed in full coherence with and build upon existing and upcoming EU frameworks and policies

Experts from other institutions and academia were consulted in a dedicated workshop “*Measuring resilience and its role in the ‘beyond GDP’ paradigm shift*” on 25/2/2021. In April 2021, the

³ See also <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/time-transformative-resilience-covid-19-emergency>

⁴ See further in the forthcoming 2021 Strategic Foresight Report.

Commission launched a consultation process with Member States and in May 2021, the dashboards were presented in the first ministerial meeting of the EU-wide Foresight Network.

A broader consultation of the dashboards will run from 30 July to 30 September 2021 on the Commission's Strategic Foresight website⁵. The goal is to further improve the assessment of Europe's resilience, by opening the tool to further comments and suggestions, *inter alia* from other EU institutions and the European Social Partners.

The process of constructing the dashboards has revealed a lack of indicators and data in some areas. As many resilience-relevant indicators are under development, and new data are expected to become available, the list of indicators should be seen as dynamic and may be revised. The resilience dashboards will thus be regularly updated, adjusted, and reviewed, in a process of collective intelligence with the participation of Member States and other relevant stakeholders.

Using a battery of indicators, their goal is to provide a holistic assessment of countries' capacities and vulnerabilities related to the green, digital, and fair transitions, as well as to strengthen Europe's resilience to various shocks and its capacity to act in the global scene. The four dimensions are constructed not only to complement one another but also to underline their interconnections.

For instance, they stress some of the social and economic consequences of the green and digital transitions and look at economic aspects of Europe's geopolitical standing. In particular, the social and economic dimension includes indicators that point to vulnerable groups that may be adversely affected by the green and digital transitions (e.g., jobs at risk due to automation). The green dimension considers the potential increase in the use of energy due to the digital transition, as a challenge for the sustainable use of resources.

The dashboards also contribute to an integrated approach for measuring people's wellbeing beyond GDP⁶. They assess the ability to cope with present and future challenges, which is needed to achieve the wellbeing of current and future generations despite uncertain circumstances. Their multidimensional perspective sheds light on challenges and opportunities ahead, promoting the operationalisation of transition-led policies and helping to steer societal transformation towards a more sustainable development path.

These dashboards represent an innovative tool that can help countries assess areas for improvement and action and, in the medium term, will contribute to answering the important question whether our policies are making societies more resilient in the short and long run. The analysis is also extended to non-EU countries, to assess the EU's resilience in an international comparison. This is

⁵ https://ec.europa.eu/info/strategy/strategic-planning/strategic-foresight/2020-strategic-foresight-report/resilience-dashboards_en

⁶ Since the 2007 Istanbul Declaration on Measuring Social Progress and the 2009 report of the Stiglitz-Sen-Fitoussi Commission (<https://ec.europa.eu/eurostat/documents/8131721/8131772/Stiglitz-Sen-Fitoussi-Commission-report.pdf>), there has been much progress towards going beyond conventional economic measures like gross domestic product (GDP) to measure wellbeing a policy target. The Commission has actively participated in this debate, see, for instance, COM(2009)433 final, GDP and beyond: measuring progress in a changing world; and SWD(2013)303 final, Progress on 'GDP and beyond' actions. A recent overview of the beyond-GDP discussion is https://ec.europa.eu/info/sites/default/files/economy-finance/dp142_en.pdf. The study emphasizes the importance of distributional considerations, the depletion of natural resources and environmental sustainability as elements to include. Beyond these elements, components such as the role of social cohesion, building up social capital through social ties are also meaningful to measure societal resilience and wellbeing.

particularly relevant for the geopolitical dimension, where some aspects are meaningful dominantly at the EU-level aggregate.

The resilience dashboards complement and provide added value with respect to other Commission tools thanks to the following specificities:

- (i) while existing tools largely aim to assess development and progress in the EU and Member States, for instance along the transitions or as regards specific policy targets, the dashboards have been designed to “distil” resilience features, that drive the ability to make progress and reach those policy targets amidst challenges;
- (ii) while most existing tools tend to be sectoral or focus on single policy fields, the resilience dashboards offer a holistic and multidisciplinary picture, focussing on multiple dimensions of resilience at a time, as well as their interlinkages;
- (iii) the dashboards are informed by strategic foresight, in that they have been constructed through a collective intelligence process aimed to consider relevant megatrends (long-term driving forces that will most likely have a significant impact on Europe’s future).

Each resilience dashboard contains a selection of quantitative indicators (around 30 per dimension for the EU level analysis and 12 per dimension for the comparison with global players) depicting:

- (i) vulnerabilities, i.e., features that can exacerbate the negative impact of crises, structural changes and transitions, or obstacles that may hinder the achievement of long-term strategic goals;
- (ii) capacities, i.e., enablers of the transitions, or abilities to cope with crises and structural changes and to manage the transitions.

The dashboards follow a relative assessment approach and are not meant to rank countries. For each indicator, a scale of five colours indicates the countries’ relative situation in the latest available year (usually 2018-2020)⁷, compared to the pooled values of all available data for all Member States in the reference period 2007-2017. The indicators are drawn from publicly available data sources, mostly official statistics (e.g., Eurostat).

Compared to the prototypes in the 2020 SFR, these new resilience dashboards present the following methodological improvements: (i) a dynamic perspective of resilience, assessing changes of the indicators over time, where data are available; (ii) the assessment of capacities and vulnerabilities at EU-level; and (iii) the development of synthetic resilience indices, aggregating, for each country and the EU, the relative situation of vulnerabilities and resilience capacities along each of the four dimensions.

The structure of this report is as follows. **Section 2** summarizes the process of building the dashboards. **Section 3** explains the essentials of the underlying methodology. **Section 4** presents the Member State level dashboards in four dimensions and the corresponding synthetic indices.

⁷ The use of past data should not be seen as a limitation, as the forward-looking nature of the dashboards lies in the selection of the indicators. It should include aspects and issues that represent vulnerabilities or capacities that will or may become relevant in the future, both to achieve societal transformation and to overcome potential new shocks. The dashboards then present the current level of these foreseen vulnerabilities and capacities, not their projected future levels. It would be difficult to include indicators based on forecasts, as the underlying assumptions and methodologies would need to be accepted by the stakeholders.

Section 5 puts the four dimensions together. **Section 6** presents the extension beyond the EU. Annexes are in a separate document. **Annex I** gives details on the methodology, while **Annex II** presents the gap analysis. **Annex III** compares the resilience dashboards with other existing monitoring frameworks. **Annex IV** presents the correlation structure of the indicators. **Annexes V-VII** provide details on the indicators and corresponding data sources.

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2. CONSTRUCTION OF THE RESILIENCE DASHBOARDS

The dashboards aim to capture vulnerabilities and capacities in the four dimensions:

- **Vulnerability:** it is a country's structural feature that points to elements of its systems (economic, social, and environmental) that can be disproportionately hit in case of shocks/structural changes, or can hinder the transitions (e.g., an obstacle to the transition). A particular case is represented by vulnerable groups, defined as groups of people who would suffer a major loss from and would have difficulties in coping with the shock/undergoing the transitions. For example, people whose jobs are at a high risk of automation.
- **Capacity:** it is a country's structural feature that points to elements of its system (economic, social, and environmental) underpinning its ability to cope with shocks/structural changes and achieve transitions successfully. Examples include policies (e.g., active labour market policies), human and social capital (e.g., skills and digital competences) as well as the capacity to innovate through e.g., investments or innovative enterprises.

In general, vulnerabilities are more related to the notion of risk (e.g., exposure or potential loss), while capacities point to the ability to cope and to grasp opportunities (absorption, adaptation, transformation)⁸. Both sides should be taken into consideration because they often require different types of policy interventions, and mitigating vulnerabilities should not be done at the cost of damaging existing capacities (or vice versa). In some cases, the classification of an indicator into capacities or vulnerabilities has a degree of subjectivity and is the result of expert assessment.

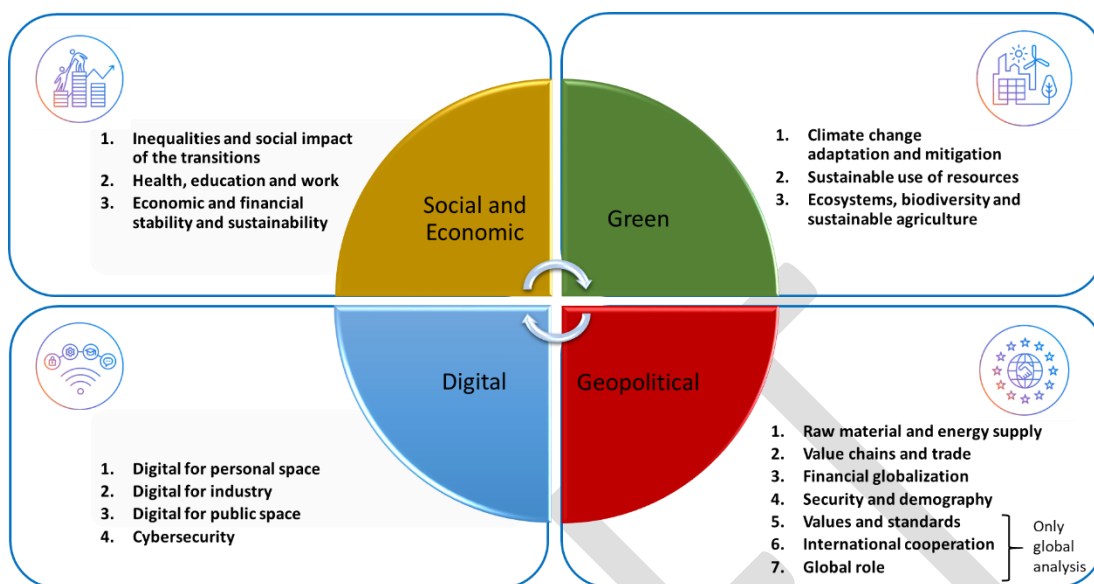
The dashboards are structured into broad areas, which should be considered as a guide for the reader through the indicators rather than a fixed organization. In some cases, indicators may fall under more than one area.

The construction of the dashboards for the Member State level consisted of the following steps:

- 1) **Development of the structure.** This was a conceptual step assessing all relevant topics for each dimension, organized in broad thematic areas. Sectoral aspects are important but should be well balanced and serve the purpose of painting the broad picture of the transitions and other challenges. **Figure 3** presents the areas covered in each dimension.

⁸ The distinction between vulnerabilities and capacities is more evident when considering shocks. For example, supplier concentration in raw materials or energy represents a risk to supply security, while innovations in the material and energy sectors are key capacities to tackle these risks. For structural changes and transitions, the distinction in some cases becomes less straightforward.

Figure 3: Areas covered in the four dimensions of the resilience dashboards.



For the social and economic, green, and digital dimensions the analysis is developed both at the level of EU countries and at global level. For the geopolitical dimension, the analysis is developed at both levels for the first four areas, while for the last three the analysis is only at global level.

2) Selection of the indicators. This was based on an extensive analysis of available indicators and data, followed by a collective assessment of their relevance and scope. Selection and allocation in the various areas were based on the following qualitative and quantitative criteria:

- Holistic view: covering as many and as multidisciplinary aspects as possible, while balancing indicators across areas and keeping their number contained at around 30⁹.
- Representativeness: what and how much the indicator tells us about the considered area.
- Relevance and value-added: how much the indicator is linked to resilience, whether it describes a specific vulnerability or a resilience capacity, and whether it adds value compared to standard progress indicators such as GDP.
- Coherence with other existing monitoring frameworks, to ensure alignment and avoid duplication (see Annex III).
- Forward-looking perspective: how much the indicator brings in forward-looking aspects.

⁹ Being restricted to a small set of indicators, the resilience dashboards exclude many important elements, such as detailed breakdowns by age, gender, disability status etc.

- Clarity: how clear the interpretation of the direction of change of the indicator is (the higher the better or vice versa)¹⁰, and whether it has a clear and intuitive meaning¹¹.
- Comparability: how much the indicator ensures meaningful cross-country comparisons, considering specific features of the country (e.g., area, economy, population, etc.).
- Data quality and availability: whether the indicator comes from official statistics. Priority was given to Eurostat, data from Commission services, and data from international institutions like OECD and World Bank¹².
- Granularity: whether data cover all Member States and span at least five years, to assess the evolution over time.

3) Mapping and streamlining the indicators. The indicators were mapped into the broad areas and assigned to vulnerabilities or capacities. The mapping was performed considering across-dimension linkages. For instance, indicators pointing to social and economic consequences of the twin transitions have been placed in the social and economic dashboard. The correlation structure of the indicators was also assessed (see Annex IV). The overall dashboards were streamlined in terms of their overall balance across areas, and between vulnerabilities and capacities.

4) Gap analysis (see Annex II). While the structure of the dashboards aims at being comprehensive, the selection of the indicators is at times limited by data availability or quality. This implies that there are gaps in each dimension. For some areas, new statistics are already being developed and collected and can be considered for future inclusion. For some others, further work will be required. As such, the list of indicators shall be considered dynamic and it may be reviewed regularly, allowing also factoring in new aspects of the transitions.

The Member State level dashboards are complemented with a global extension. These global dashboards contain a subset of indicators from the Member State level, spanning as much as possible the same areas. They seek to look at resilience at the level of the whole EU, comparing the situation across many countries of the globe¹³. By moving the focus beyond individual Member States, it becomes possible to indicate some of the extra strength that the EU level can add.

To span geopolitical aspects comprehensively, the geopolitical dimension contains a set of areas for which the analysis is only meaningful (or even possible) at the global level. The corresponding indicators do not necessarily indicate a clear vulnerability or capacity. Instead, they paint the global situation with the EU as one major actor.

¹⁰ All the indicators are treated in such a way that the higher the more resilient. This implies that for capacities the higher the better and for vulnerabilities the higher the worse.

¹¹ In particular, the dashboards try to avoid using composite indicators. The only exception is the Global Cybersecurity Index. In the social and economic dimension one indicator (Variation in performance explained by students' socio-economic status) is based on the Pisa index.

¹² For a limited number of indicators that point to particularly relevant concepts other sources of data were accepted (special surveys, indicators based on modelling, etc.). See Annex V for details.

¹³ The following countries are considered: Australia, Brazil, Canada, Switzerland, China, Indonesia, India, Japan, Korea, Mexico, Norway, Russia, Turkey, United Kingdom, and the United States. For India and Indonesia, data limitations are more severe than for other countries, but they are still included in the analysis due to their increasing global role.

3. METHODOLOGY – HOW TO READ THE RESILIENCE DASHBOARDS

The dashboards present a multidimensional picture, whereby different indicators are placed next to one another, assessing the situation of countries across a number of dimensions. They use the **latest statistical year available for each indicator** (usually 2018-2020)^{14, 15}. Their main **purpose is not to rank countries but to highlight strengths to be nurtured and areas for improvement**, also in view of further country-specific analysis and policy action. For example, extreme values for a single indicator may point to vulnerabilities or bottlenecks, despite a good situation in other aspects. In some cases, a challenge is represented by more than one indicator. It is thus important to look at all indicators at the same time.

Both the Member State level and the global dashboards follow a **relative assessment approach**, i.e., each country vis-à-vis the others over a reference period. An absolute assessment would require a consensus on critical levels of vulnerabilities or targeted levels of capacities¹⁶. For each indicator, a scale of five colours indicates the countries' relative situation in the latest available year, compared to the collection of values of that indicator for all Member States and all years in the reference period 2007-2017¹⁷. For instance, a high capacity for a country means that the corresponding indicator value is high in a historical comparison across all Member States¹⁸. Since the colour scheme is relative, countries with the lowest (highest) capacities and highest (lowest) vulnerabilities could still do well in absolute terms (and vice versa). In addition, the dashboards present the corresponding EU-level situation for each indicator.

The dashboards also show **arrows, indicating the direction of recent changes**. An upward (downward) arrow indicates a sizeable improvement (worsening) with respect to the preceding five years (2015)¹⁹. This indication is particularly useful to understand if the current position of a country or the EU is the outcome of progress or deterioration over the past five years.

The dashboards are accompanied by **synthetic indices** that illustrate **the overall situation of resilience capacities and vulnerabilities** of Member States and the EU, in each area and dimension. The synthetic indices aggregate the relative situation of the Member States and the EU across all indicators in the considered area or dimension²⁰. As such, they should be read as an overall measure of resilience in relative, and not absolute, terms. In addition, as usual for a synthetic measure, they do not convey the complete information provided by the full set of indicators in the dashboards, and as such, they cannot substitute them.

Annex I provides a more technical description and further details of the methodology.

¹⁴ Adopting a single reference year for all indicators would result in using outdated information for most of them.

¹⁵ The dashboards will be regularly updated and data revisions in official statistics will be taken into account within the reference data sets. These latter are expected to have limited impact on the dashboards.

¹⁶ Obtaining this for all the indicators would require an agreement on a battery of benchmarks and policy targets. Many indicators (e.g. education policies, taxation, or social policies) refer to areas of national competence, making this even more difficult.

¹⁷ The fast pace of the digital transformation necessitates to work with a shorter reference period for this dimension, 2015-2019. The same reasoning is applied to the indicator on the uptake of electric and hydrogen vehicles in the green dashboard. Finally, when less than four years of data is available for an indicator in 2007-2017, it is checked if 2015-2019 contains more data.

¹⁸ The global dashboards focus on the whole EU, so individual Member States are not included in the reference distribution.

¹⁹ An arrow up (down) for a vulnerability corresponds to a sizable decrease (increase) in this vulnerability in the last five years.

²⁰ The balance among the broad areas and across vulnerabilities and capacities within each dimension ensures that there is no need to assign importance weights to the individual indicators.

4. THE RESILIENCE DASHBOARDS IN FOUR DIMENSIONS

This section presents the proposed resilience dashboards along the four dimensions. The correlation structure of the indicators within each dimension is reported in Annex IV.

4.1. The social and economic dimension

Resilience in the social and economic dimension is defined in the 2020 SFR as “*the ability to tackle economic shocks and achieve long-term structural change in a fair and inclusive way.*” The dashboard looks at elements related to the main areas in the social and economic domain: inequalities and the social impact of the transitions, health, education and work, and economic and financial stability and sustainability.

Combining indicators that point to individual well-being, social capital, economic conditions, including at the regional level, and institutional features, the dashboard aims to provide a holistic picture of the social and economic vulnerabilities and resilience capacities of Europe’s societies and economies. Key topics such as social and economic status, equality, health, education, employment, regional disparities, and innovation are thus monitored across this dimension²¹.

Moreover, the dashboard links resilience to the social impact of the twin transitions, by pointing to vulnerable groups or conditions that emerge as a result of the green and digital transitions, such as employment in energy-intensive sectors, jobs with high automation risk, skills mismatch, or lagging regions. It also considers indicators related to mechanisms that enable countries to cope with structural changes or shocks, such as automatic stabilisers of the tax-benefit system, government expenditures on social protection, or active labour market policies. While constraints on the total number of indicators do not allow expanding in detail on the many underlying heterogeneities (for instance, by age, gender, disabilities, and ethnic background), it takes into consideration the regional dispersion in income and the gender employment gap²².

This dashboard also takes into account aspects related to social cohesion, which represents the ability of a society to bridge and bond together by drawing on social capital. Active citizenship in its realization of providing concrete support to other people in need represents a necessary social buffer to cushion crisis events. Finally, the dashboard aims to bring in forward-looking aspects like ageing and demographic developments, as well as investment and innovation, which will potentially have an increasing impact on health, wellbeing, labour markets, and fiscal sustainability going forward.

The first area of the dashboard is dedicated to **inequalities and the social impact of the green and digital transitions**, including regional disparities. In particular, the area accounts for manifestations of social and economic inequalities such as the at-risk-of-poverty and social

²¹ This is also aligned with the approach proposed in the conclusions of the Finland’s Presidency of the Council of the European Union in 2019 on the Economy of Wellbeing, that promoted a “cross-sectoral assessment of impacts on wellbeing in order to strengthen knowledge-based policy and decision-making”. See: Council of the European Union 13171/19: <https://data.consilium.europa.eu/doc/document/ST-13171-2019-INIT/en/pdf>

²² There are two additional equality-related variables in the digital dimension: the gender gap among ICT specialists, and the rural-urban gap in access to broadband. The risk from automation, or the sectoral adjustments necessitated by the green transition may also create important challenges to equality.

exclusion rate, the income quintile share ratio, and the regional dispersion in household income as a gauge for regional socio-economic vulnerabilities. It covers vulnerable groups that can emerge due to the twin transitions, e.g., employment in energy-intensive sectors or jobs with high automation risk. It also includes indicators that describe means to alleviate these inequalities such as government social expenditures, the impact of social expenditures on poverty reduction, as well as household savings. It is crucial that the current recovery and the transitions ahead do not magnify such inequalities. Another important aspect covered is societal cohesion, which is monitored by active citizenship.

The second area of social and economic resilience refers to **health, education, and work**. It covers the main features of education systems from early childhood until adulthood, also featuring the quality of education and the extent to which Europe's education systems promote equal opportunities for students' educational achievements, irrespective of their socio-economic backgrounds. This area also targets indicators related to emerging health risks on the vulnerability side (e.g., antimicrobial resistance, and the years of life lost due to PM 2.5) and corresponding capacities of the health system (such as a low rate of preventable and treatable mortality, and the number of healthy life years at birth). Various aspects of the labour market are also included, such as the employment rate, the gender gap in employment, or active labour market policies.

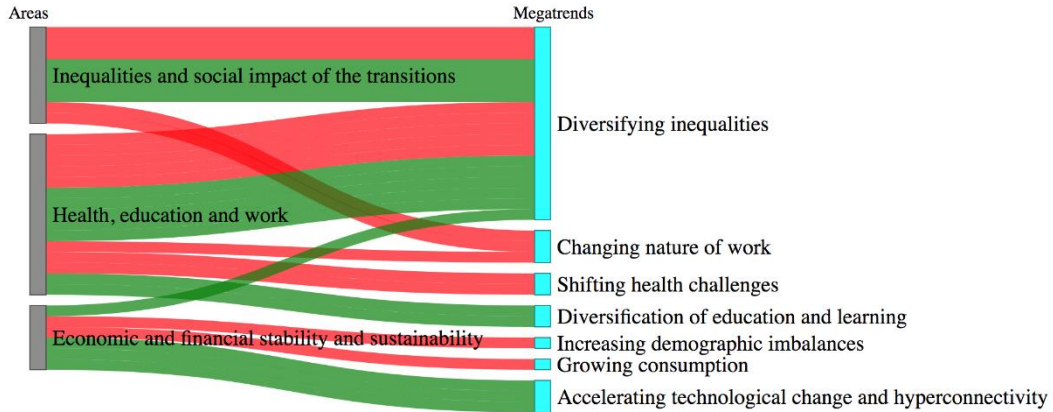
The third area covers **economic and financial stability and sustainability**, and the interlinkages with the public sector²³. This area highlights the vulnerabilities and capacities of banks and insurance companies to face financial shocks as well as threats through insufficient diversification of the economy. It includes the ability of society to be equipped for future transitions through investment in intangibles, which are important ingredients in innovative economies. It also features the key role of the government as an investor. Finally, it presents future challenges to the sustainability of the public sector, driven by demographic changes and high levels of indebtedness.

To highlight the forward-looking perspective of this dashboard, **Figure 4** presents a mapping between the indicators included and ongoing megatrends, in particular related to inequalities, health, education, and the changing nature of work²⁴.

²³ International and global aspects (intra-EU trade and the single market, extra-EU trade, value chains, FDI, financial integration) are addressed in the geopolitical dimension.

²⁴ https://knowledge4policy.ec.europa.eu/foresight/tool/megatrends-hub_en. The detailed mapping of each individual indicator is presented in Annex V. The megatrends are currently being updated. The mapping will be re-run with the new megatrends as soon as they will all become available.

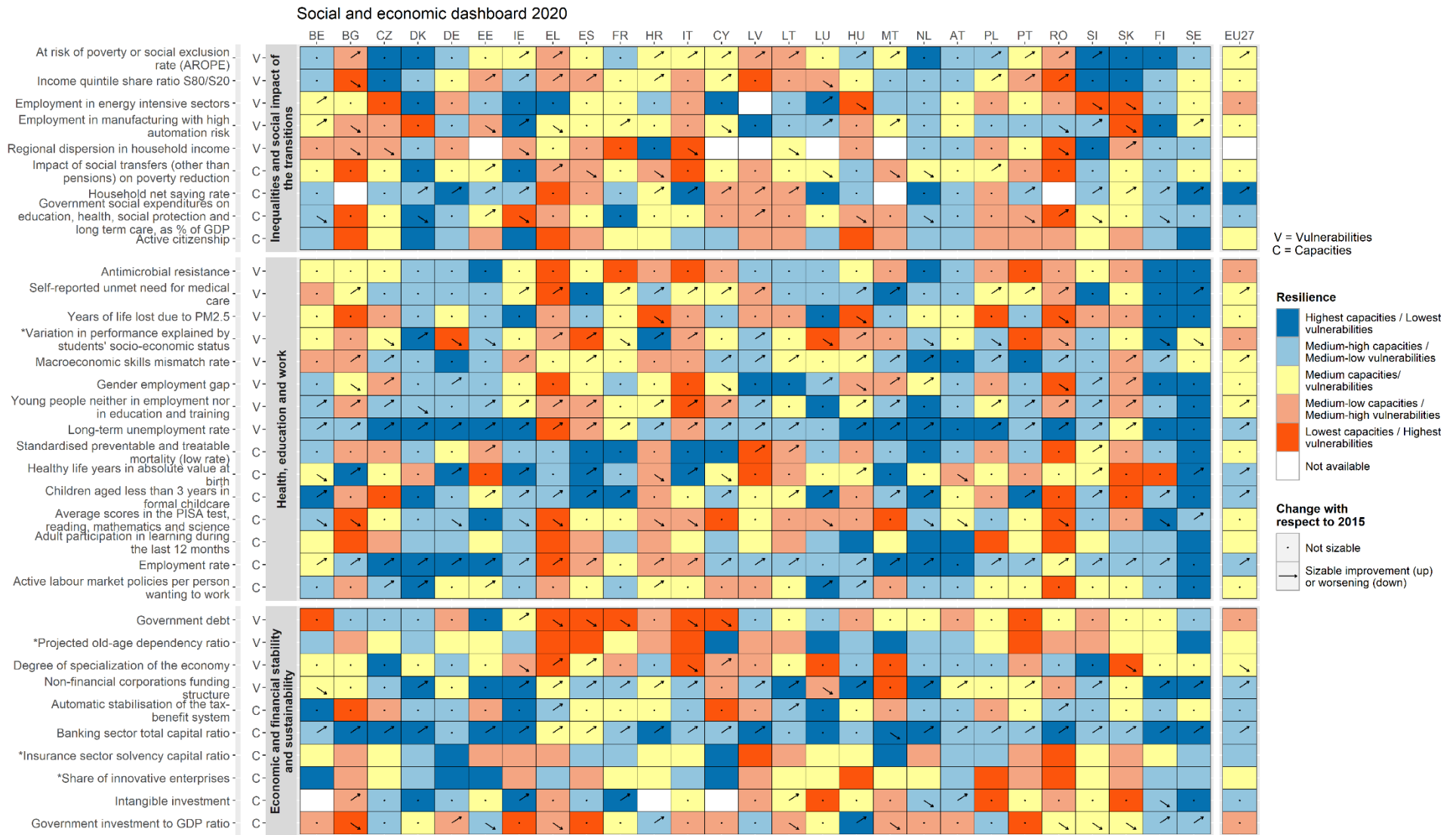
Figure 4: Mapping of the indicators in the social and economic dashboard (left) and the megatrends (right).



Green lines are for capacities, red for vulnerabilities. For the one-to-one correspondence, see information in Annex V.

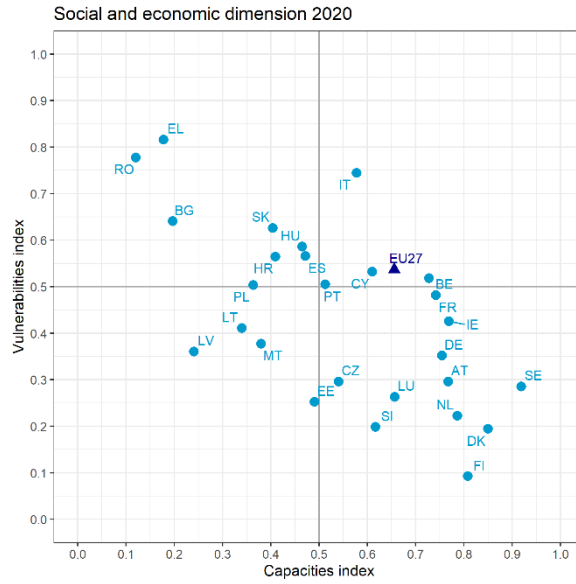
Figure 5 presents the draft dashboard for the social and economic dimension, where the data refers to the latest available year. **Figure 6** and **Figure 7** plot the capacities and vulnerabilities indices. This shows both the countries' relative position in terms of overall resilience and the relationship between vulnerabilities and capacities.

Figure 5: Social and economic dashboard, latest available year for each indicator.



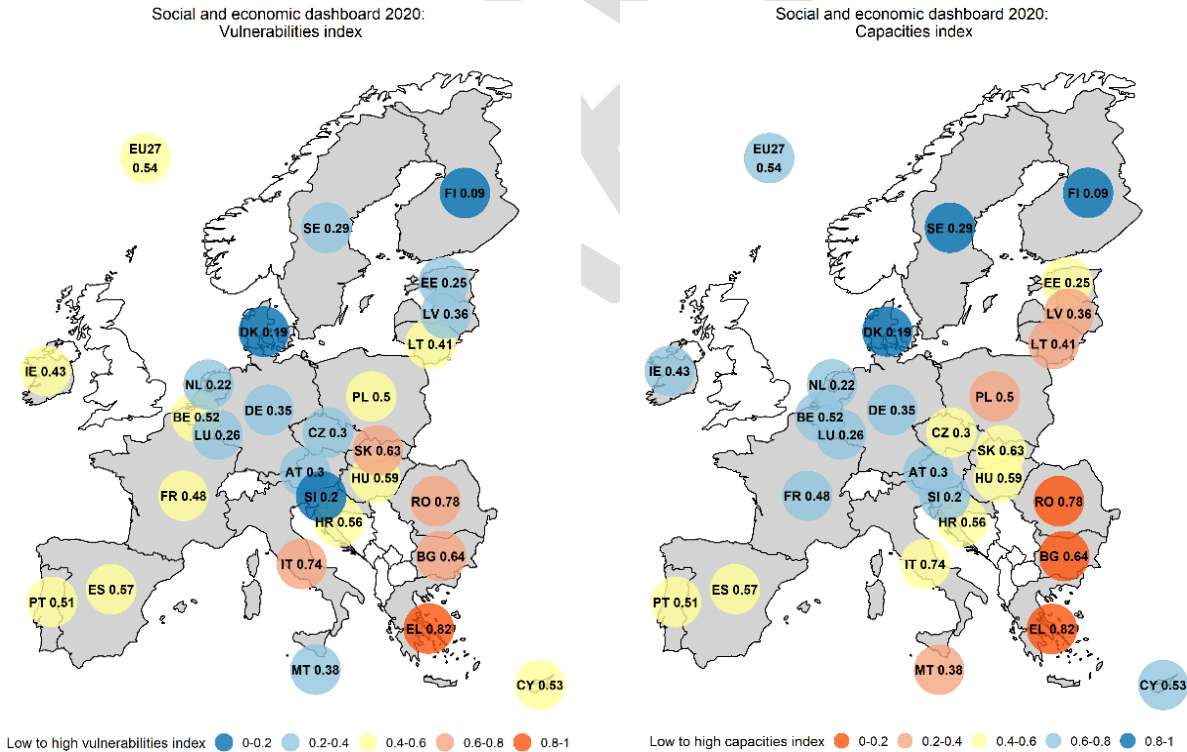
The dashboard includes a set of indicators important to grasp the level of vulnerability and resilience capacities within a country, relative to others. Data typically refers to 2018-2020. Download from Eurostat as of 18 June 2021. The colours indicate the position of a country in the distribution of all available values for EU countries in the 2007-2017 reference period (2015-2019 for indicators with an asterisk). An upward pointing arrow for a vulnerability indicates a substantial reduction (improvement). See Annex I for further details on the methodology, and Annex V on the indicators.

Figure 6: Social and economic dashboard: vulnerabilities versus capacities synthetic indices.



The synthetic indices aggregate the relative situation of the Members States and the EU across all considered indicators. A higher capacity index indicates higher (relative) capacities, while a higher vulnerability index shows higher (relative) vulnerabilities. See Annex I for further details on the methodology.

Figure 7: Social and economic dashboard: synthetic indices.



Differently from the dashboards, the colours for the indices are assigned by splitting the range of variation of the synthetic index [0,1] into five equal intervals. This ensures comparison of colours across dimensions. Note that the synthetic indices aggregate the relative situation of the Members States and the EU across all considered indicators. A higher capacity index indicates higher (relative) capacities, while a higher vulnerability index shows higher (relative) vulnerabilities. See Annex I for further details on the methodology.

4.2. The green dimension

Green resilience, as defined in the 2020 SFR, is “*about reaching climate neutrality by 2050, while mitigating and adapting to climate change, reducing pollution and restoring the capacity of ecological systems to sustain our ability to live well within planetary boundaries*”. The proposed dashboard aims at highlighting features that either represent a contextual criticality for the transition (e.g., soil erosion by water; CO₂ emissions from road transport), or the structural potential that can act as an engine towards its success (e.g., CO₂ absorption by forests; waste recovery rate).

The dashboard is structured along three broad areas covering: (i) *climate change mitigation and adaptation*, (ii) *sustainable use of resources*, and (iii) *ecosystems, biodiversity, and sustainable agriculture*. The indicators are broadly aligned with the policy areas of the European Green Deal²⁵ and the environmental objectives in the EU taxonomy legislation²⁶.

By 2050, the EU aims to become a climate-resilient society and the first climate-neutral continent²⁷. This will be achieved through a set of climate-targeted policies, among which many address the reduction of greenhouse gas emissions, endorsing carbon-neutral vehicles, boosting renewable energy, and promoting safe and sustainable, climate friendly technologies. As mitigation will not be enough, the EU needs to adapt in parallel to the unavoidable impacts of climate change and strengthen its climate resilience²⁸.

Along these broad policy lines, the **climate change mitigation and adaptation** area embeds indicators related to emissions (overall GHG and transport CO₂ emissions, but also carbon sink capacity of the forests). It includes sustainable mobility indicators such as carbon neutral vehicles share (Battery Electric Vehicles (BEV) and Hydrogen (H₂) fleet fuelled by renewable energies) and share of people that use “green” transport modes, such as trains. It highlights features that may hinder the achievement of climate neutrality (e.g., fossil fuel subsidies) and capacities that will facilitate the transition (e.g., use of renewable energy). Last but not least, given that the number of extreme climate events has been increasing, it shows the overall vulnerability to such events (fatalities to climate extremes) and the ability to adapt by sharing unevenly distributed losses (insured losses from climate extremes), which represent relevant forward-looking aspects.

The second broad area covers aspects of the **sustainable use of resources**. It includes aspects of material footprint (water exploitation, domestic footprint, material consumption, and energy use). It points to the ability to produce high values per unit of resources and energy (resource and energy productivity). It monitors the ability to foster the circular economy through close monitoring of waste generation and reuse of materials (including e-waste). Finally, it shows the overall size of the environmental goods and services sector, which contributes to minimize the impact of

²⁵ Broad policy areas, as defined in the Green Deal are Biodiversity, From Farm to Fork and Sustainable Agriculture, Clean energy, Sustainable industry and mobility, Eliminating pollution and Climate action. For more info, see: https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

²⁶ Regulation (EU) 2020/852 (Taxonomy) on the establishment of a framework to facilitate sustainable investment, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R0852&from=EN>

²⁷ https://ec.europa.eu/clima/policies/eu-climate-action_en

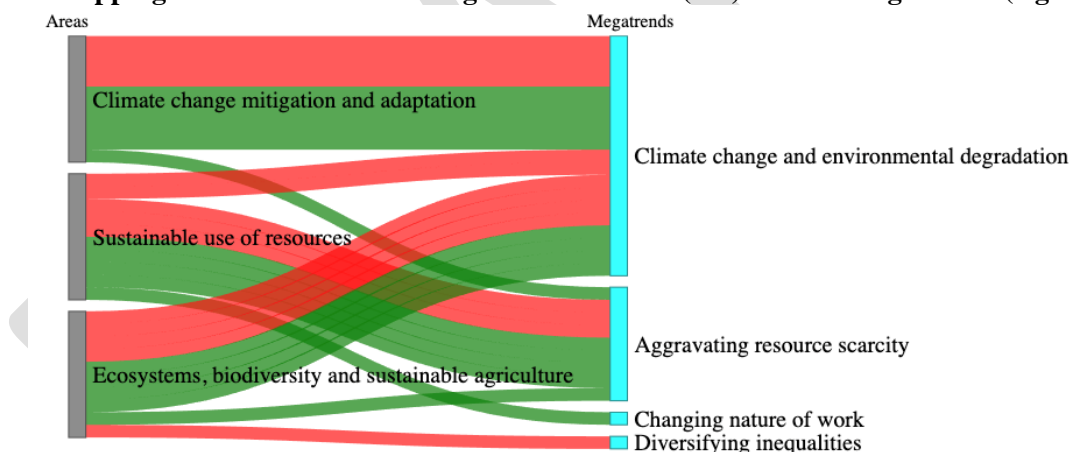
²⁸ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0082&from=EN>

economic activity on resource depletion or environmental degradation (Gross Value Added in the environmental goods and services sector). This sector will catalyse the transition in general.

The third broad area, **ecosystems, biodiversity and sustainable agriculture**, is closely related to the European Green Deal goal of restoring biodiversity and ecosystem services. Resilient ecosystems contribute to the carbon sink and have an important impact on climate change adaptation, resources, and health and well-being in general. They are also strongly connected to the goal of sustainable food systems²⁹. The indicators in this area monitor aspects and drivers of biodiversity (farmland bird index, soil erosion, sealing and organic carbon content); sustainable agriculture (farm income variability as an indicator of agricultural resilience, and organic farming as one potential example of agricultural practices particularly beneficial for biodiversity); and some management aspects of natural resources that have a strong impact on ecosystems (such as the use of pesticides, treatment of wastewaters, protection of natural areas and overall expenditure on environmental protection).

To highlight the forward-looking perspective of this dashboard, **Figure 8** presents a mapping between the indicators included and ongoing megatrends, mostly in relation to resource scarcity, climate change and environmental degradation.

Figure 8: Mapping of the indicators in the green dashboard (left) and the megatrends (right).



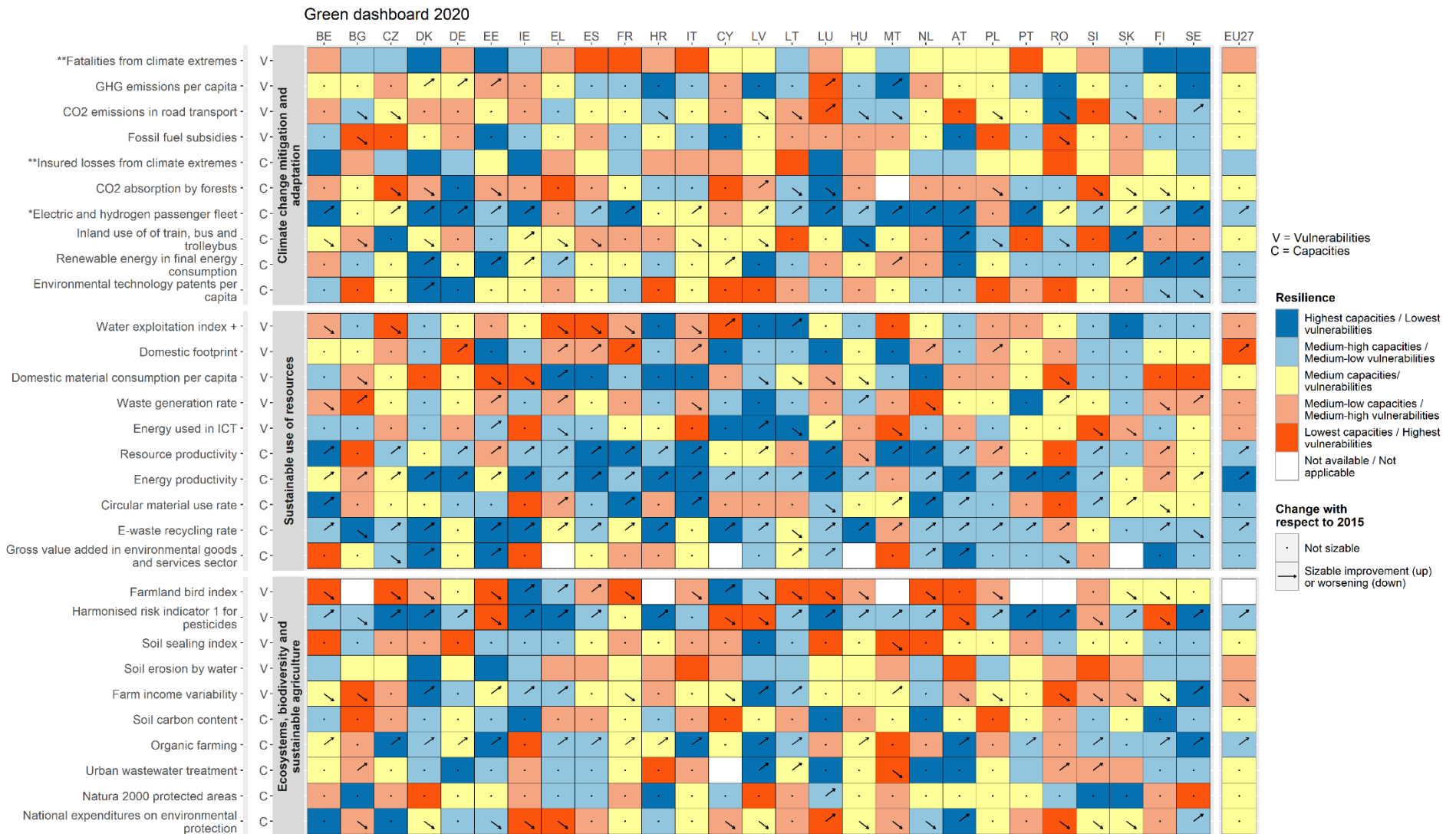
Green lines are for capacities, red for vulnerabilities. For the one-to-one correspondence, see information in Annex V.

Figure 9 presents the draft dashboard for the green dimension, where the data refers to the latest available year. **Figure 10** and **Figure 11: Green dashboard: synthetic indices.** plot the capacities and vulnerabilities indices. This shows both the countries' relative position in terms of overall resilience and the relationship between vulnerabilities and capacities.

²⁹ https://ec.europa.eu/info/sites/info/files/research_and_innovation/green_deal/updt-gdc_stakeholder_engagement_topic_07-1_biodiversity_and_ecosystems.pdf

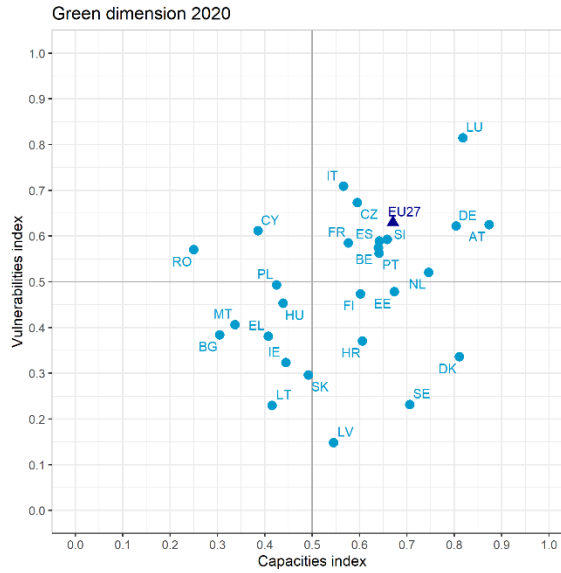
Draft, July 26, 2021

Figure 9: Green dashboard, latest available year for each indicator.



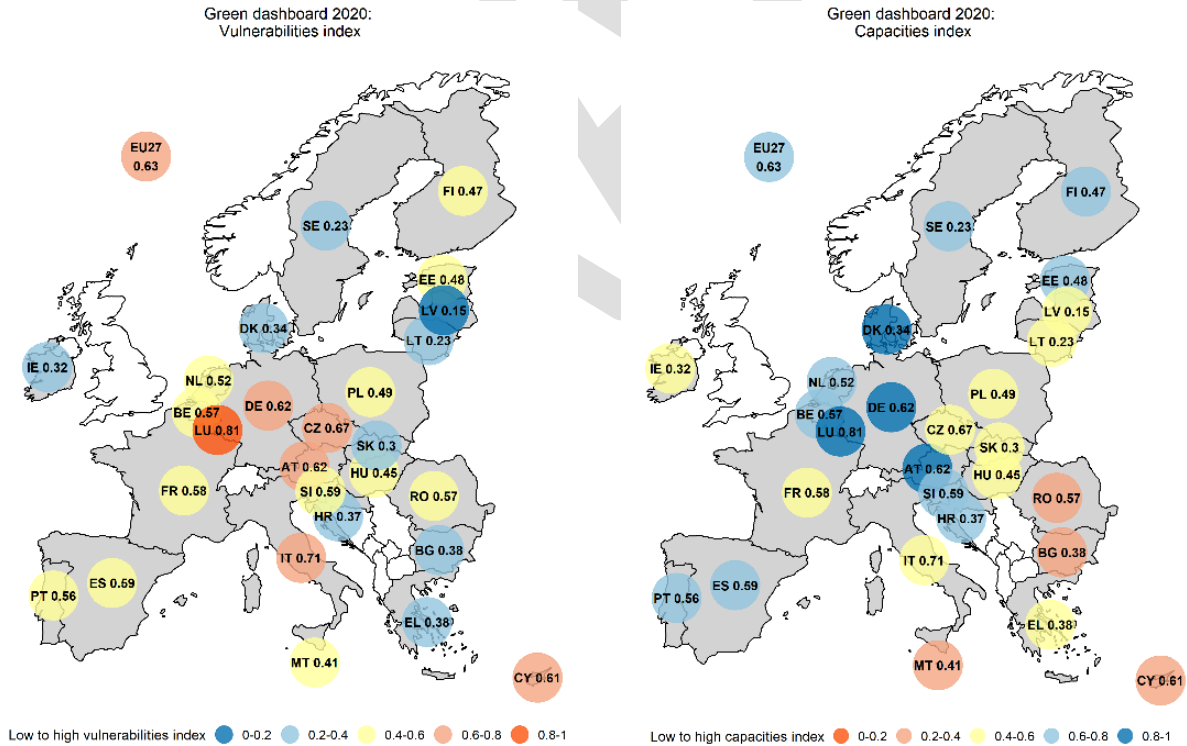
The dashboard includes a set of indicators important to grasp the level of vulnerability and resilience capacities within a country, relative to others. Data typically refers to 2018-2020. Download from Eurostat as of 18 June 2021. The colours indicate the position of a country in the distribution of all available values for EU countries in the 2007-2017 reference period (2015-2019 for indicators with an asterisk and a cumulative single value for 1981-2019 period for indicators with a double asterisk). An upward pointing arrow for a vulnerability indicates a substantial reduction (improvement). See Annex I for further details on the methodology, and Annex V on the indicators. Data for the domestic footprint indicator is still preliminary. The final version will become available in the next months.

Figure 10: Green dashboard: vulnerabilities versus capacities synthetic indices.



The synthetic indices aggregate the relative situation of the Members States and the EU across all considered indicators. A higher capacity index indicates higher (relative) capacities, while a higher vulnerability index shows higher (relative) vulnerabilities. See Annex I for further details on the methodology.

Figure 11: Green dashboard: synthetic indices.



Differently from the dashboards, the colours for the indices are assigned by splitting the range of variation of the synthetic index [0,1] into five equal intervals. This ensures comparison of colours across dimensions. Note that the synthetic indices aggregate the relative situation of the Members States and the EU across all considered indicators. A higher capacity index indicates higher (relative) capacities, while a higher vulnerability index shows higher (relative) vulnerabilities. See Annex I for further details on the methodology.

4.3. The digital dimension

Digital resilience, as defined in the 2020 SFR, is “*about ensuring that the way we live, work, learn, interact, and think in this digital age preserves and enhances human dignity, freedom, equality, security, democracy, and other European fundamental rights and values*”.

The proposed dashboard is framed, in line with the Commission’s Digital Agenda, around four areas. The first three are thematic: digital for personal space, digital for industry and digital for public space. The last one, dealing with cybersecurity, is transversal to the other three. In general, vulnerabilities reflect more the infrastructure side, and capacities are mostly associated with human capital and new digital services.

These different areas need to be considered together since the physical-digital integration will become a central element of our society, where the Internet of Things, smart home technology, the use of big data, and increasingly efficient technologies based on artificial intelligence will become the new normal.

The dashboard aims at representing the important aspects of our society that will be affected the most by the digital transition, acknowledging that some effects are difficult to predict and that interconnections and potential spillovers would play an important role. These characteristics make it quite challenging today to define clear boundaries among the different areas. In a near future, they would probably make it necessary to introduce new indicators to better describe the latest digital developments.

Indicators are grouped into different areas according to where their impact will have the largest effect. The first area, **digital for personal space**, relates to how the digital transition will affect the personal sphere. The on-life paradigm is already part of our society, and it is essential to keep monitoring the evolution of new means for education and re/up skilling, on new modalities of work (teleworking), and on the role of social media in shaping people’s future *on-life* behaviour.

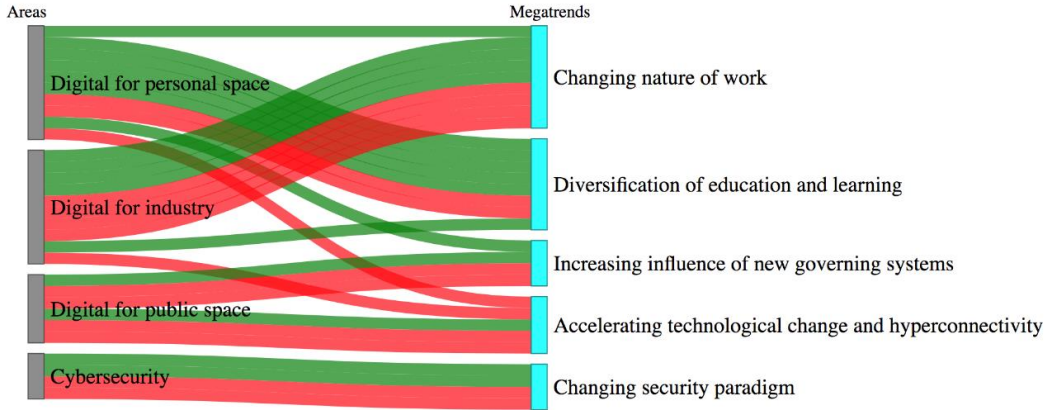
The second area, **digital for industry**, looks at the impact of digitalisation on the industrial sector through different elements in the business life cycle: from broadband access to the size and vitality of the ICT sector, and to the use of innovative platforms (e.g., cloud services and e-commerce).

Digitalisation of the **public space** is expected to be the new playing field, able to reduce existing digital divides. Both infrastructures (e.g., 5G) and the availability (or the lack of) of e-government services are considered.

Finally, the **cybersecurity** area depicts concerns and awareness of citizens towards cyber-threats, as well as the overall quality of security measures, in order to highlight how countries are dealing with potential new fragilities associated with the digital transition.

To highlight the forward-looking perspective of this dashboard, **Figure 12** presents a mapping between the indicators included and ongoing megatrends related to changing the security paradigm, accelerating technological change and hyperconnectivity, changing the nature of work, diversifying the education system, increasing the influence of new government systems.

Figure 12: Mapping of the indicators in the digital dashboard (left) and the megatrends (right).



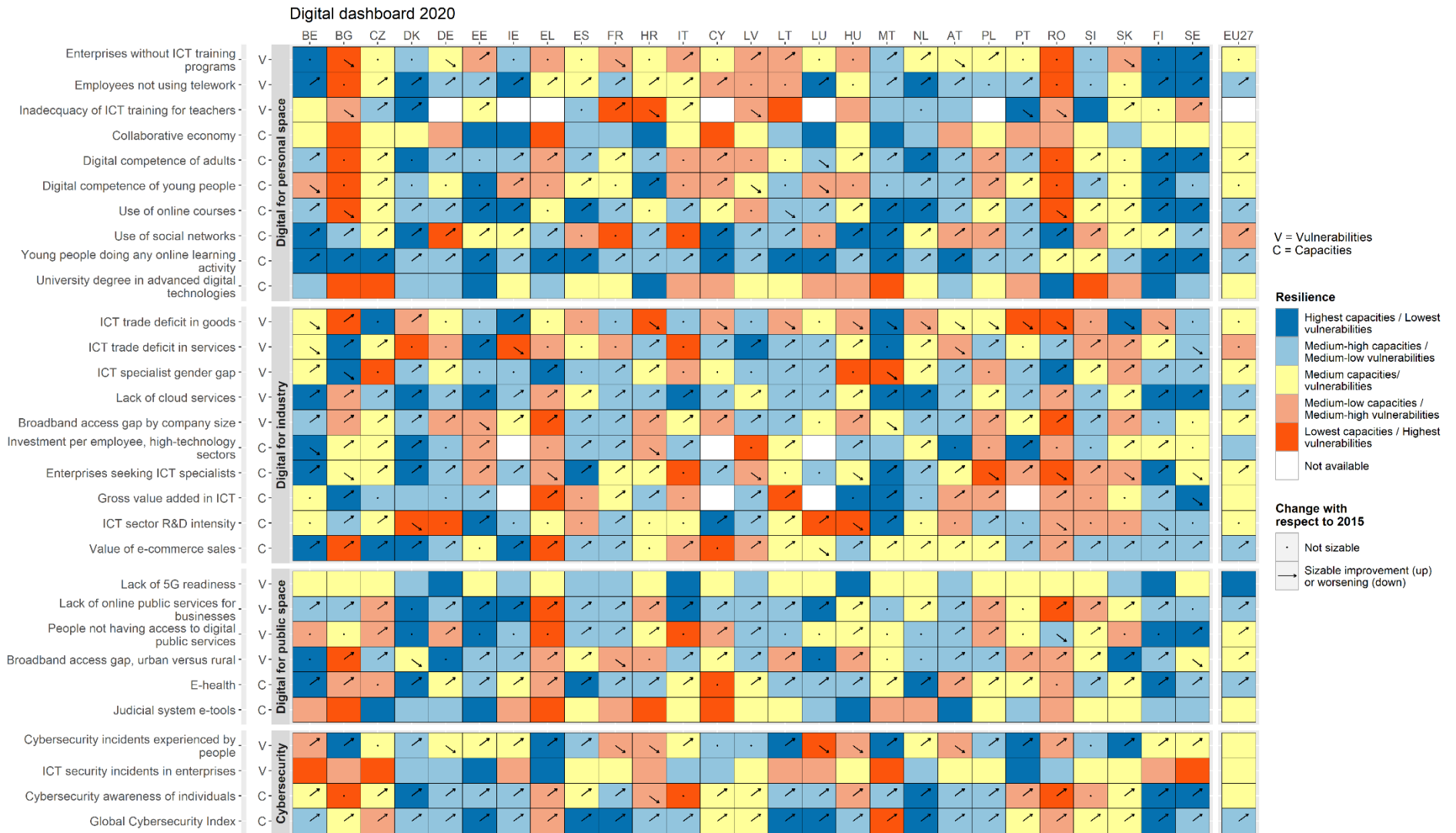
Green lines are for capacities, red for vulnerabilities. For the one-to-one correspondence, see information in Annex V.

Figure 13 presents the draft dashboard for the digital dimension, where the data refers to the latest available year. **Figure 14: Digital dashboard: vulnerabilities versus capacities synthetic indices** and **Figure 15** plot the capacities and vulnerabilities indices. This shows both the countries' relative position in terms of overall resilience and the relationship between vulnerabilities and capacities.

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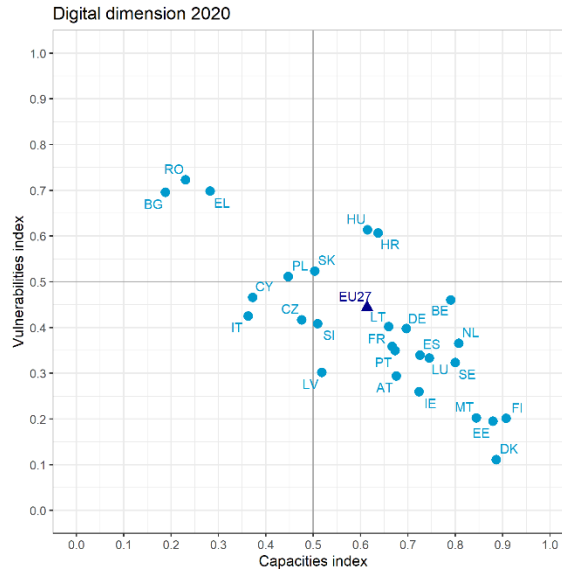
Draft, July 26, 2021

Figure 13: Digital dashboard, latest available year for each indicator.



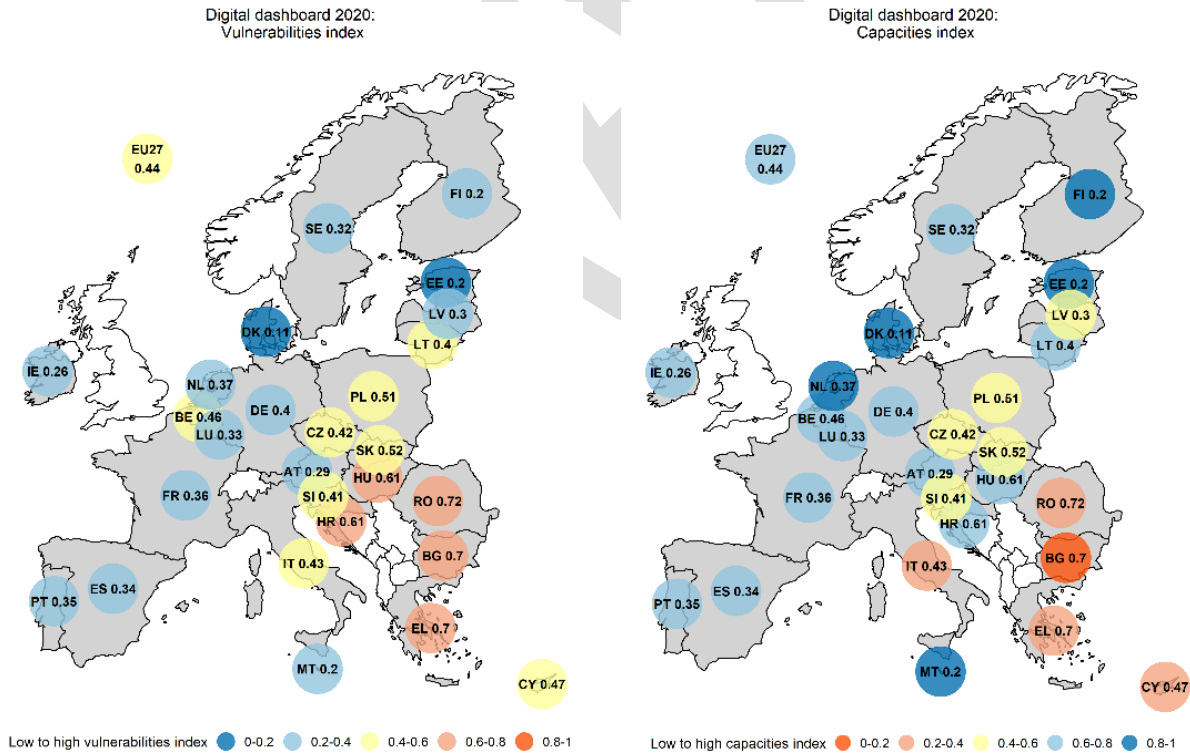
The dashboard includes a set of indicators important to grasp the level of vulnerability and resilience capacities within a country, relative to others. Data typically refers to 2018-2020. Download from Eurostat as of 18 June 2021. The colours indicate the position of a country in the distribution of all the available values for EU countries in the 2015-2019 reference period. An upward pointing arrow for a vulnerability indicates a substantial reduction (improvement). See Annex I for further details on the methodology, and Annex V on the indicators.

Figure 14: Digital dashboard: vulnerabilities versus capacities synthetic indices



The synthetic indices aggregate the relative situation of the Members States and the EU across all considered indicators. A higher capacity index indicates higher (relative) capacities, while a higher vulnerability index shows higher (relative) vulnerabilities. See Annex I for further details on the methodology.

Figure 15: Draft digital dashboard: synthetic indices.



Differently from the dashboards, the colours for the indices are assigned by splitting the range of variation of the synthetic index [0,1] into five equal intervals. This ensures comparison of colours across dimensions. Note that the synthetic indices aggregate the relative situation of the Members States and the EU across all considered indicators. A higher capacity index indicates higher (relative) capacities, while a higher vulnerability index shows higher (relative) vulnerabilities. See Annex I for further details on the methodology.

4.4. The geopolitical dimension

While the general notion of resilience adopted in the 2020 SFR is similar to previous communications on the EU's strategic approach to resilience³⁰, the notion of geopolitical resilience is more specific³¹: it relates to *Europe bolstering its 'open strategic autonomy' and global leadership role*. It is anchored in the expression of the EU's values within a highly interdependent world of competing powers³². The topic is further elaborated in the forthcoming 2021 SFR.

The collective intelligence process has highlighted that the geopolitical dimension features many aspects where a country-level analysis is not possible or is less ready to offer conclusions (e.g. for important aspects of trade, foreign policies, or international leadership). It also includes areas for which there are no standard statistical measures (disinformation, manifestation of EU values in trade agreements or international collaboration activities), or concepts which may be difficult to quantify (ability to steer the development of global institutions and multilateralism, ability to disseminate values, or hybrid threats). For these reasons, this dimension is organised around seven broad thematic areas. The first **four areas** feature **indicators** that monitor resilience **at the Member State level**. They are complemented with **three 'global areas'** that present **comparisons** only between the EU and some **non-EU countries** (e.g., the US, China, India, Japan, Russia, and the UK). These are presented and discussed in Section 6.

The first area focuses on the main aspects of Europe's dependencies and security with respect to **raw material and energy supply**. It covers potential vulnerabilities such as the supplier concentration in base metals and energy carriers, and the capacities of Member States such as intra-EU trade in energy and the rate of change in supplier diversification in base metals and energy carriers.

The second area on **value chains and trade** looks at the concentration of trading partners, which could unveil vulnerabilities in trade and value chains. It also monitors the trade openness of Member States with other EU countries (reflecting the role of the single market) and with third countries, and participation levels in global value chains, which are important capacities to counteract trade disturbances and to reap the benefits from global economic cooperation³³. Given the interplay of the indicators on value chains and trade concentration, it is particularly important to consider them simultaneously for an assessment of resilience.

³⁰ COM (2012) 586 final, "The EU Approach to Resilience – learning from Food Security Crises". 3 October 2012, JOIN/2017/021 final, "A Strategic Approach to Resilience in the EU's external action".

³¹ In its 2017 Joint Communication on 'A Strategic Approach to Resilience in the EU's external action', the Commission recognises the pressures affecting its external partners, and that EU external policy in advocating resilience of its partners can contribute to strengthening resilience within the Union itself. This is aligned with the 2020 SFR's notion of resilience as the *ability not only to withstand and cope with challenges but also to undergo transitions, in a sustainable, fair, and democratic manner*.

³² Open strategic autonomy is defined as "the EU's commitment to open and fair trade, preserving the benefits of an open economy and supporting partners around the world to lead the renewed and reinvigorated form of multilateralism the world needs. At the same time, the EU is aware of the need to reduce its dependency and strengthen its security of supply across key technologies and value chains (COM (2020) 456 final, "Europe's moment: Repair and Prepare for the Next Generation").

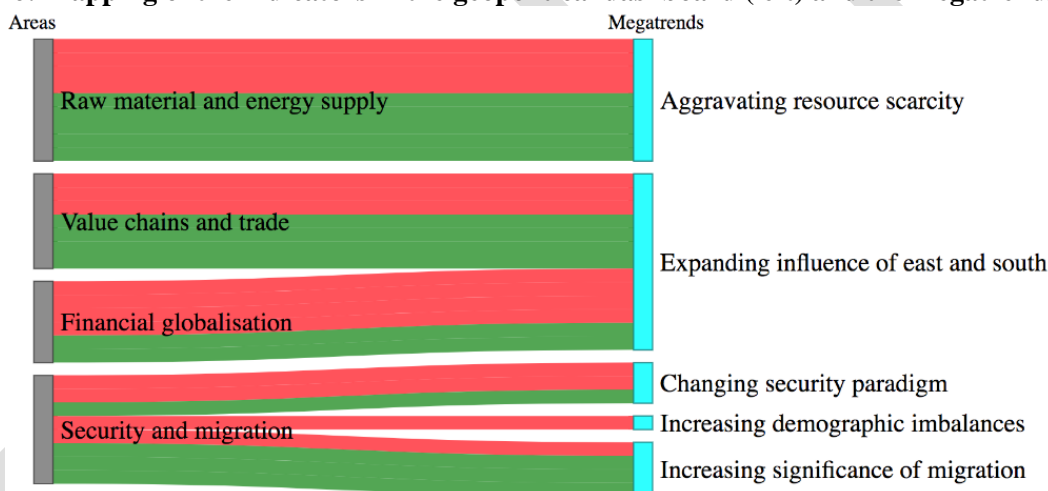
³³ A low degree of openness does not indicate a general "weakness" of an economy: a measure of openness can also be small if an economy is large and hence more self-sustained.

Financial globalisation treats vulnerabilities such as the concentration of FDI partner countries and external debt of Member States with respect to countries outside the EU. It also comprises financial integration with respect to EU countries and third countries as a key capacity.

Finally, in the **security and demography** area, the dashboard covers capacities and vulnerabilities for defence (like military personnel and expenditures, and disinformation originating from abroad) and some aspects on demographic trends³⁴ such as the fertility rate in Member States and the integration of migrants in the labour market.

To highlight the forward-looking perspective, **Figure 16** presents a map between the indicators included in the first four areas and ongoing megatrends. The ones that are particularly important in the geopolitical dimension are the expanding influence of East and South, aggravating resource scarcity, increasing demographic imbalances, the significance of migration, and a changing security paradigm.

Figure 16: Mapping of the indicators in the geopolitical dashboard (left) and the megatrends (right).

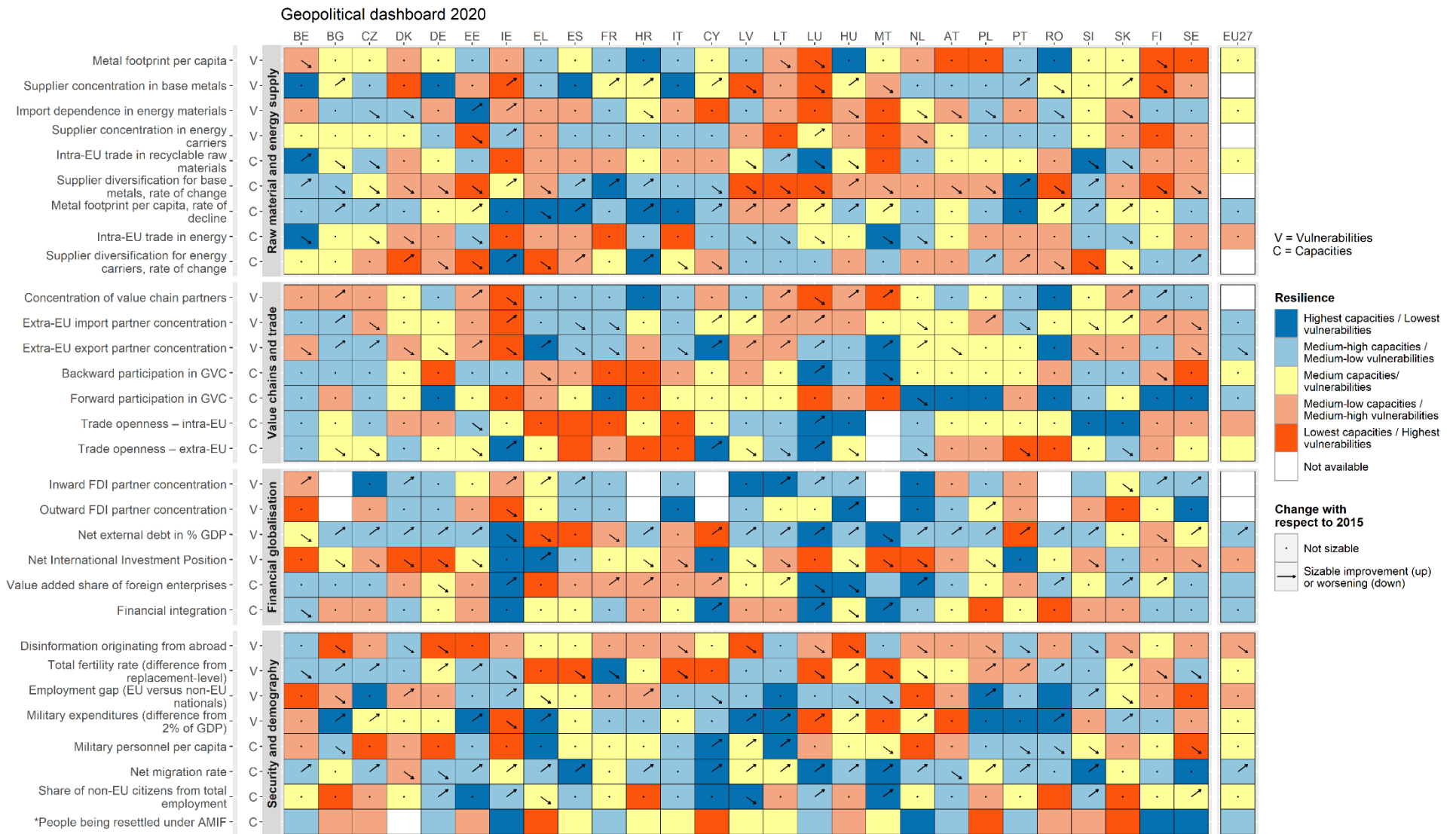


Green lines are for capacities, red for vulnerabilities. For the one-to-one correspondence, see information in Annex V.

Figure 17 presents the draft dashboard for the geopolitical dimension, where the data refers to the latest available year. **Figure 18** and **Figure 19** plot the capacities and vulnerabilities indices. This shows both the countries' relative position in terms of overall resilience and the relationship between vulnerabilities and capacities.

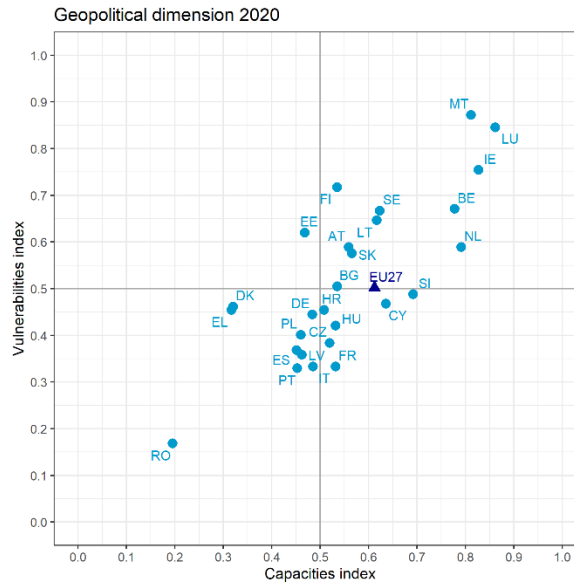
³⁴ Demography strongly overlaps with the social and economic dimension as well. We chose to include it in the geopolitical dimension to emphasize the challenges of a declining global population share of the EU, and of migration. This is also aligned with the 2021 Strategic Foresight Report.

Figure 17: Geopolitical dashboard, latest available year for each indicator.



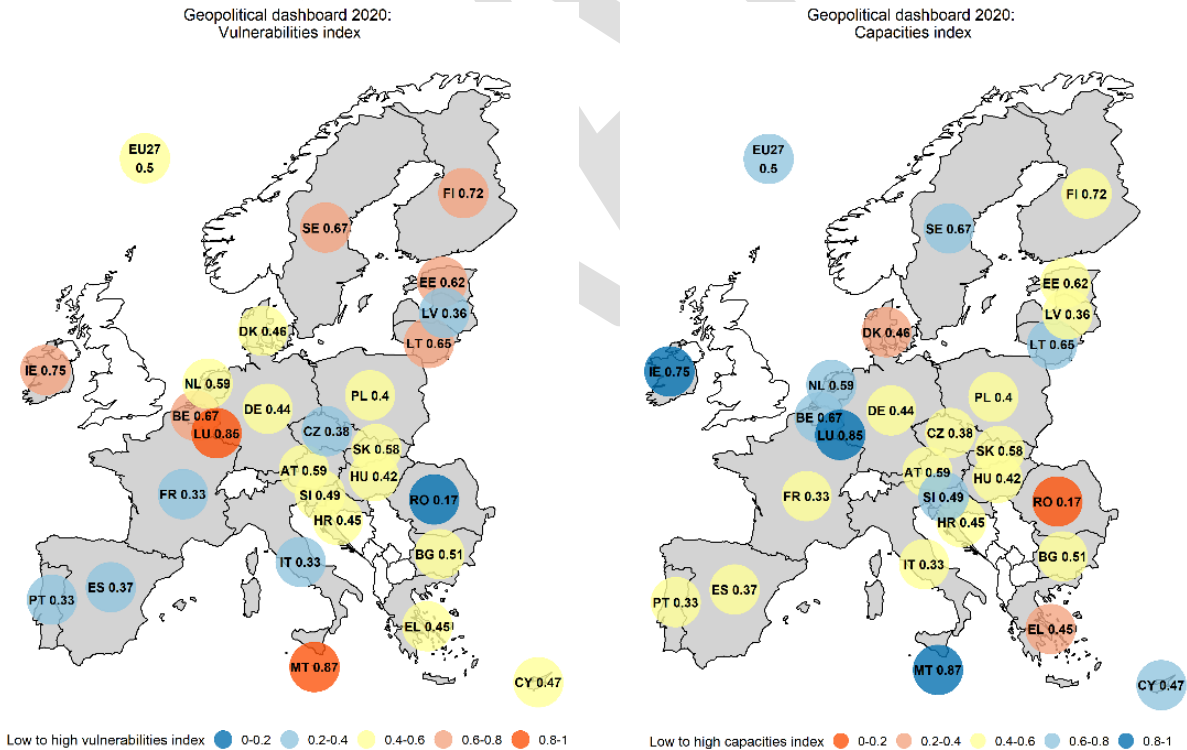
The dashboards include a set of indicators important to grasp the level of vulnerability and resilience capacities within a country, relative to others. Data typically refers to 2018-2020. Download from Eurostat as of 18 June 2021. The colours indicate the position of a country in the distribution of all available values for EU countries in the 2007-2017 reference period (2015-2019) for indicators with an asterisk). An upward pointing arrow for a vulnerability indicates a substantial reduction (improvement). See Annex I for further details on the methodology, and Annex V on the indicators.

Figure 18: Geopolitical dashboard: vulnerabilities versus capacities synthetic indices.



The synthetic indices aggregate the relative situation of the Members States and the EU across all considered indicators. A higher capacity index indicates higher (relative) capacities, while a higher vulnerability index shows higher (relative) vulnerabilities. See Annex I for further details on the methodology.

Figure 19: Geopolitical dashboard: synthetic indices.



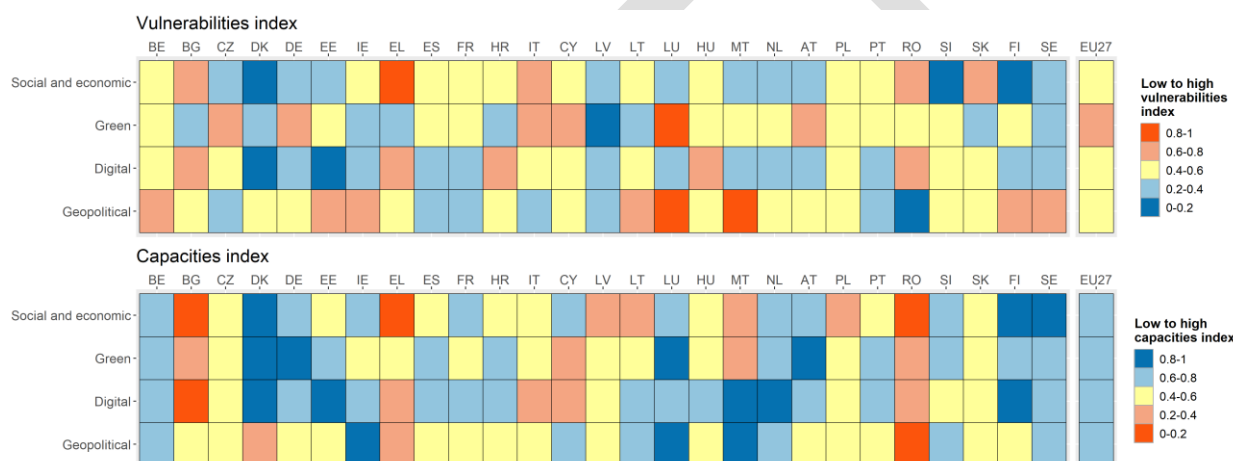
Differently from the dashboards, the colours for the indices are assigned by splitting the range of variation of the synthetic index [0,1] into five equal intervals. This ensures comparison of colours across dimensions. Note that the synthetic indices aggregate the relative situation of the Members States and the EU across all considered indicators. A higher capacity index indicates higher (relative) capacities, while a higher vulnerability index shows higher (relative) vulnerabilities. See Annex I for further details on the methodology.

5. THE INTERCONNECTIONS BETWEEN THE FOUR DIMENSIONS

The four dimensions are constructed not only to complement one another but also to underline their *interconnections*. The situation of vulnerabilities or capacities across the various areas and the four dimensions may exhibit various patterns within each Member States and can show similarities or significant differences in general.

To uncover such relationships, **Figure 20** puts together the eight synthetic indices. The colours are assigned in the same way as on the maps for each individual dimension. For some Member States, the overall situation is fairly similar across all dimensions, both for vulnerabilities and capacities. In some other cases, the situation is rather different between vulnerabilities and capacities, but is still relatively homogenous within these two classes. Finally, there are many countries where the situation varies heavily across dimensions going from dark blue to dark orange.

Figure 20: Synthetic indices across all dimensions.



The synthetic indices aggregate the relative situation of the EU and its Member States across all considered indicators in the four dimensions. A higher capacity index indicates higher (relative) capacities, while a higher vulnerability index shows higher (relative) vulnerabilities. See Annex I for further details on the methodology.

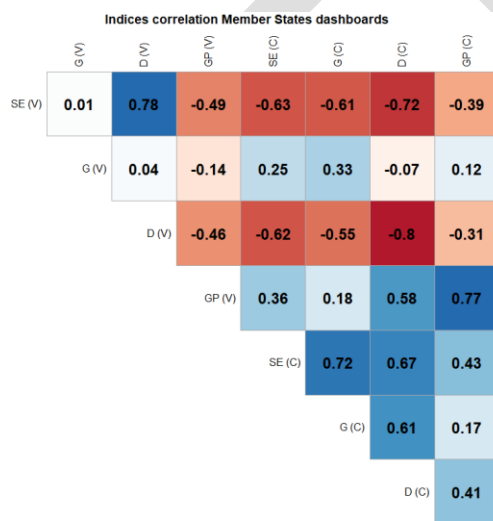
The overall similarity of the eight indices can be broadly assessed by looking at their pairwise correlations (**Figure 21**). The capacity indices are quite correlated, especially the social and economic, green, and digital dimensions. It implies that capacities tend to be similar across these three dimensions: if one dimension shows a high capacity, the other two also tend to be high. This is much less the case for vulnerabilities, except for a sizable positive correlation between the social and economic and the digital dimension, and a moderate negative correlation between the social and economic and the geopolitical dimension.

When looking at the relationship between vulnerabilities and capacities, the social and economic and the digital vulnerability indices stand out by exhibiting strong negative correlations with all capacities (except for the geopolitical). Green vulnerabilities are positively but only weakly correlated with green capacities, and they appear to be unrelated to other capacities. Finally, geopolitical vulnerabilities show a strong positive correlation with geopolitical capacities, and a positive though somewhat weaker correlation with digital capacities.

It is worth emphasising the relationship between vulnerabilities and capacities within the same dimension. The geopolitical dimension has a positive and high “internal” correlation. It means that more vulnerable Member States also exhibit higher capacities to tackle the challenges. For the digital dimension, the pattern is exactly the opposite, as there is a large but negative correlation between digital capacities and vulnerabilities. For the social and economic dimension, the correlation is negative but not that strong. The green dimension has only a low (but positive) correlation between its vulnerabilities and capacities.

It is important to stress that these findings do not necessarily imply causality. For example, there is no guarantee that an improvement in geopolitical capacities would lead to a simultaneous increase in geopolitical vulnerabilities. Exploring such causal patterns would necessitate further analysis, also using the dynamic behaviour of the indices.

Figure 21: Correlation among the synthetic indices.



SE, G, D, GP denotes respectively the social and economic, green, digital, and geopolitical dimensions. V stands for vulnerabilities and C for capacities.

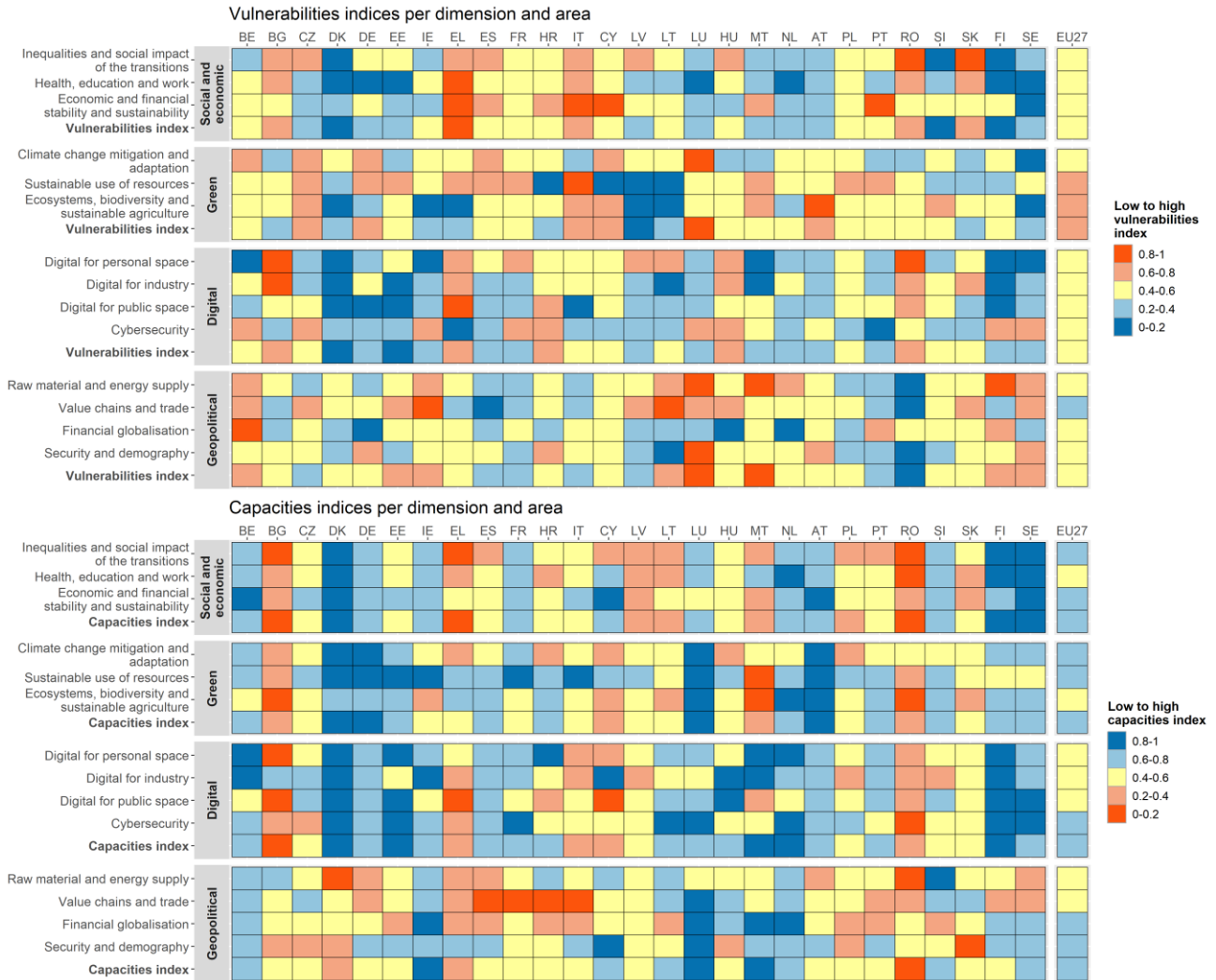
In addition, **Figure 22** presents the synthetic indices for each area of each dimension. In Annex IV, we also present the correlation structures of the synthetic indices across areas for each dimension. Like the dashboards, the synthetic indices reveal some heterogeneity with respect to vulnerabilities and capacities in the different areas and dimension.

Some countries have low vulnerabilities indices in all areas of the social and economic dimension while showing high capacities indices in the areas of inequalities and the social impact of the transitions and in health, education, and work. For other countries, the picture is more heterogeneous with higher (lower) vulnerabilities indices and lower (higher) capacities indices. In the green dimension, vulnerabilities indices are moderate to low while capacities indices are high, leading also to high capacities indices in all areas for the EU.

For the digital dimension, low vulnerabilities in the areas of digital for personal space, industry and digital for public space are often accompanied with moderate to high vulnerabilities in

cybersecurity. In the geopolitical dimension, the area of value chains and trade reveals a moderate to low capacities index which is often accompanied with a low vulnerabilities index. Other areas such as financial integration and security and demography reveal a moderate to high capacities index.

Figure 22: Synthetic indices across all areas and all dimensions.



The synthetic indices aggregate the relative situation of the EU and its Member States across all considered indicators in the areas of the four dimensions. A higher capacity index indicates higher (relative) capacities, while a higher vulnerability index shows higher (relative) vulnerabilities. See Annex I for further details on the methodology.

6. ANALYSIS AT THE GLOBAL LEVEL

6.1. Resilience dashboards at the global level

The analysis of resilience at the global level (**Figure 23**) mirrors the one developed at Member State level but suffers from data unavailability or cross-country comparability issues. For all dimensions, it is developed only for a subset of indicators presented in the Member State level analysis, with data coming from different data sources that cover a broad range of countries³⁵. Coherence in the definitions and data with respect to the Member State level indicators was a key criterion. For a few aspects, the indicators are slightly different compared to the Member State level analysis, in order to be able to capture some areas that would otherwise not be covered (e.g., education, innovation and digital aspects) or to better capture global heterogeneities (e.g., GHG emissions). Still, it was not always possible to balance the areas, and aspects of vulnerabilities and capacities.

The **social and economic** dimension for the global comparison aims at providing an assessment of vulnerabilities and capacities of the EU and other global players in tackling economic shocks and achieving long-term structural change in a fair and inclusive way. It is built to mirror as much as possible aspects on inequalities, health, education and work, and elements related to economic and financial stability and sustainability already present in the assessment at Member State level.

Compared to the dashboard at Member State level, one of the biggest gaps relates to aspects of social capital and cohesion such as trust in people or civic engagement. Another important gap relates to indicators on household savings, where it is difficult to obtain consistent measures across countries worldwide. On education, there is lack of indicators on literacy rate or on performance in education with the needed time and country coverage. To cover this area, an indicator depicting the share of graduates from tertiary education in the corresponding age group is included, which is not in the Member State level analysis. Furthermore, the global version of the ‘innovate enterprises’ indicator cannot be obtained. Data on the financial or banking situation in a global comparison are also difficult to find. Finally, in the area dedicated to health, the obesity rate of young children is included, to depict a potential future vulnerability of health status and healthcare systems, as obesity during childhood is often an indicator for obesity in adulthood.

The **green** dimension of the global dashboard aims at providing a comparative assessment of the capacities and obstacles on the worldwide road to environmental and climate sustainability. The dashboard can highlight the global leaders in terms of the green transition, and thus set up a benchmark for further improvements and provide an opportunity to learn from the best. Its focus is less on contextual features (i.e., climate-related disasters, forest capacity) and more on the ability (or the lack of it) to produce value with the most parsimonious use of the natural resources (resource and energy productivity, environmental innovation). Overall, all the three areas defined for the Member State dashboard (climate change adaptation and mitigation; sustainable use of resources; ecosystems, biodiversity, and sustainable agriculture) are balanced. The dashboard

³⁵ To ensure compatibility of indicators across countries, we relied mostly on data from the OECD, World Bank, IMF, or the UN. See Annex VI for full details.

covers indicators on emissions (general GHG emissions and transport-related CO2 emissions)³⁶, sustainable energy use (renewables and energy productivity), sobriety in resource use (water stress and domestic material consumption), environmental innovation, and protection of key biodiversity areas. Finally, there are indicators on potentially harmful practices, such as subsidizing brown energy (fossil fuels) and the extensive use of pesticides in agriculture. Despite the poorer cross-country coverage (four big countries missing), we include an indicator on the share of recovered municipal waste, because of the strong relevance of the circular economy for the green transition.

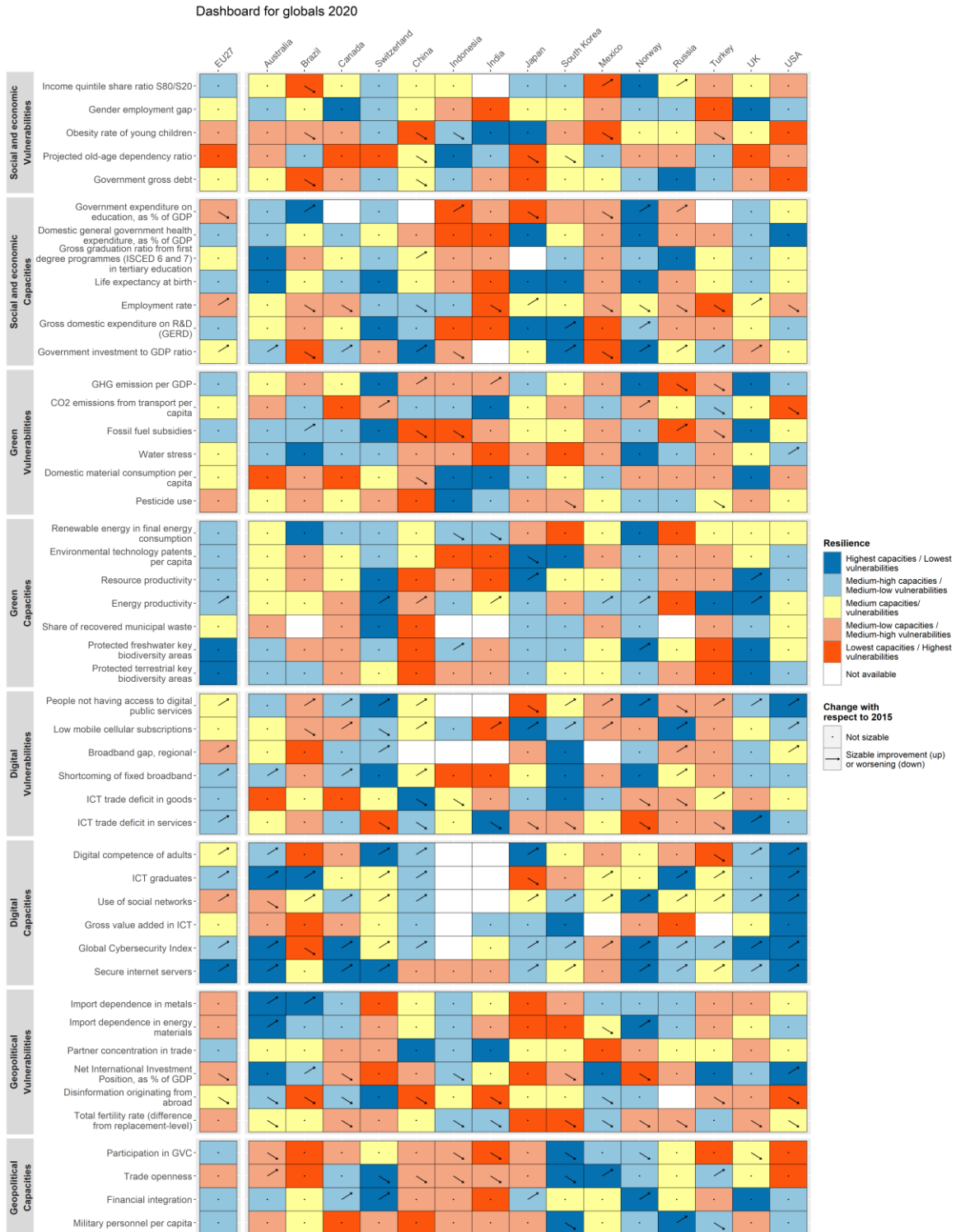
In the **digital dimension**, all areas (digital for personal space; digital for industries; digital for public space; cybersecurity) are represented with a good overall balance of capacities and vulnerabilities³⁷. Similarly to the Member State case, the time coverage is rather limited with respect to the other dimensions. A few indicators used in the global comparison are the same as those used in the Member State dashboard (e.g., ICT trade deficit in goods, ICT trade deficits in services). For some others, the lack of data forced the inclusion of different indicators to proxy the general concept behind the variables of interest (e.g., mobile subscription for 5G coverage; regional broadband gap for rural versus urban digital gap; shortcoming of fixed broadband; lack of cloud services). Main gaps with respect to the Member State dashboard lie in the field of young people digital skills (partly substituted by ICT graduates) and firms access to digital public services.

The **geopolitical dimension** consists of a subset of the indicators used in the Member State level dashboard. Import dependence on metals is the only additional variable, which is more meaningful in a global context than inside the EU, and thus replaces the supplier concentration indicator. Given the focus of the geopolitical dimension on extra-EU relationships, its global comparison is indicative of the strength of the Union level in some areas where collective coordination matters. For example, while single Member States can have high levels of external dependence in metal or energy imports, or high levels of partner concentration, these may be diversified at the Union level, emphasizing that the resilience of the EU can be higher than that coming from the aggregation of Member State indicators.

³⁶ For the comparison in the global setting, GHG total emission are rescaled on GDP instead of using GHG per capita indicator, as the latter is strongly driven by important differences in the size of the population. Still, CO2 emissions from transport per capita are correlated with the GHG emissions per capita (a correlation of 0.82), hence still provide a proxy of countries emissions per capita intensity.

³⁷ An important source was the I-DESI indicator set (<https://digital-strategy.ec.europa.eu/en/library/i-desi-2020-how-digital-europe-compared-other-major-world-economies>). Here we relied on their normalised values, which give a complete coverage though based on imputation.

Figure 23: The global resilience dashboards for the four dimensions.



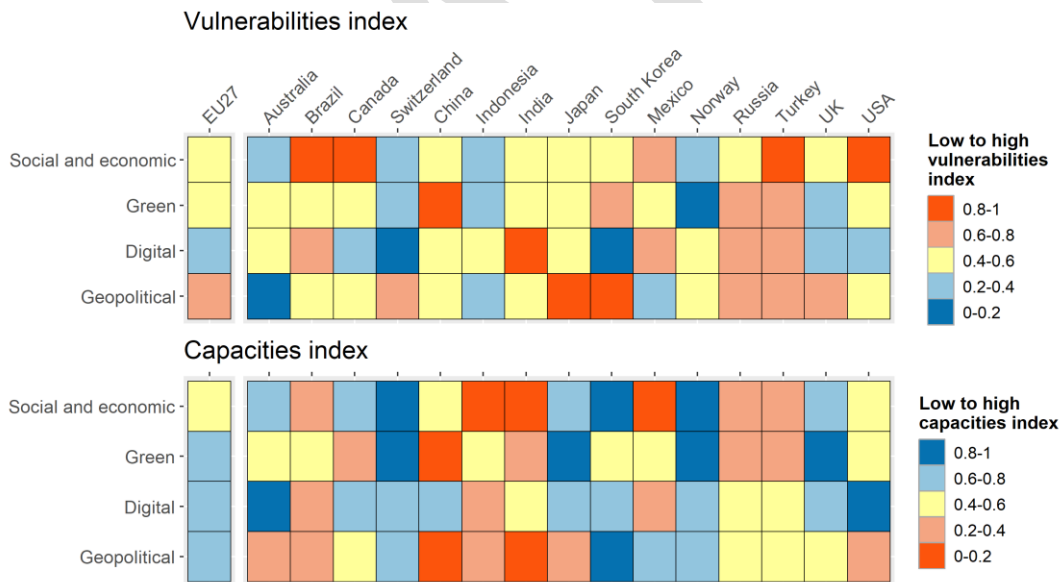
The global dashboards include a set of indicators important to grasp the level of vulnerability and resilience capacities within the EU27 as a whole, relative to other global actors. Data typically refers to 2018-2020. Download from all data sources as of 18 June 2021. The colours indicate the position of a country in the distribution of all available values for all of the countries displayed here in the 2007-2017 reference period. An upward pointing arrow for a vulnerability indicates a substantial reduction (improvement). See Annex I for further details on the methodology, and Annex VI on the indicators. .

Figure 24 displays the synthetic resilience indices across the thematic areas for the EU, in comparison to other major global actors. The Union as a whole shows robust capacities in almost all areas while the situation for vulnerabilities can still be improved.

In particular, the EU shows medium vulnerabilities in the social and economic and the green areas. Its situation is nevertheless better or similar to that of China, Japan, or the US. Together with other global actors such as Canada, the UK, or the US, the EU depicts a relatively low vulnerabilities index in the digital area, where only Switzerland and Korea outperform the Union. Geopolitical vulnerabilities are relatively high in the EU, similar to those of China, falling between Japan (even higher) and the US (lower).

Relative to China, the US, India and Brazil, the EU has higher capacities in the green and geopolitical areas, triggered mainly by its capacities in energy and resource productivity and the protection of freshwater and terrestrial areas (for the green) and in the financial integration and participation in global value chains (in the geopolitical dimension). Following the US and Australia, the EU fares well also in digital capacities, similarly to Canada, China, Japan, Korea, Norway, and the UK. Finally, EU capacities are medium in the social and economic dimension, similarly to China and the US.

Figure 24: The global synthetic indices for the four dimensions.



The synthetic indices of the global dashboard aggregate the relative situation of the EU27 and other countries across all considered indicators. A higher capacity index indicates higher (relative) capacities, while a higher vulnerability index shows higher (relative) vulnerabilities.

6.2. Global areas of the geopolitical dimension

The first global area (Area 5) aims to depict challenges to the **EU’s ability to promote its values and disseminate its standards**. It covers topics like the situation of the environment, labour standards, product safety, food security, and also democratic values and human rights. In most cases, however, it is difficult to quantify specific vulnerabilities the EU may face, or the level of

capacities. The strategy is instead to indicate the global landscape, showing whether the EU situation is similar, better, or worse than in other countries³⁸. There are a couple of more direct measures as well: the share of trade directed to the EU from total trade can indicate the scope of influence of our standards.

The second global area (Area 6) looks at **aspects of international cooperation and soft power**. It includes elements like development finance, international cooperation in innovation, trust in in the United Nations, and various soft power indicators. Investing, trading, and funding for Africa are also covered under the cooperation header.

Finally, the **global positions and comparisons area** (Area 7) aims to capture **the overall “weight” of the EU vis-à-vis other global actors**. Its first sub-area focuses on **economic aspects**: the relative shares in total world GDP, trade, or foreign direct investments, the international role of the euro (as a reserve currency), net trade in food and agricultural products, or import dependence in cereals. Given its relevance for future preparedness, the second sub-area looks at aspects linked to **innovation**, such as expenditures on R&D, the share of patents from global patents, or the number of universities in relevant global rankings. The third sub-area is related to **demography**, including aspects of migration, population change, and life expectancy. A final aspect of this area is **hard and space power**, presenting indicators such as expenditures on space programs, satellite launches, military expenditures and personnel, international military missions, and exports of weapons.

Information is presented for the same countries as in the global dashboards. The EU values are represented either by Union-level indicators, or the median value of the 27 Member States³⁹. **Figure 25, Figure 26 and Figure 27** indicate the relative size or situation across the countries, using a similar colouring scheme as in the fully developed dashboards⁴⁰. Though all variables relate to various geopolitical challenges or resilience capacities, they do not quantify vulnerabilities or capacities as clearly as the indicators in the normal dashboards. Instead, they deliver a snapshot of the EU’s standing in values and standards, its international cooperation and soft power skills and its economic, demographic, and military power on the international stage. Details on the indicators are available in Annex VII.

³⁸ There are a number of potential approaches to quantify these aspects and to compare them across countries. For example, it may be possible to trace the adoption of various EU standards in third countries (as propagated in the 2020 book “The Brussels Effect: how the European Union rules the world”, by Anu Bradford), and compare it to the adoption of other standards (e.g., of the US or China). One can also invoke qualitative expert assessments: for example, external delegations may be asked to provide a synthetic judgement about digital policies in their host country and assess how aligned they are with the EU’s approach. Voting records in the UN or other international bodies could be analysed similarly.

³⁹ For many variables, EU level numbers cannot be obtained: for example, there is no EU value for the UN’s Gender Inequality Index, or it is not possible to say how many human rights treaties have been adopted at the EU level.

⁴⁰ The colours use the same percentile cutoffs as in the normal dashboards, referring to the distribution of the values in the reported years or periods (1, 2 or 3). Colours are such that the countries with the highest values (upper 12.5% of the data) are dark blue, followed by lower values (12.5% to 37.5% of the data) in blue. Countries in the central part of the data are coloured yellow. Dark orange indicates values that are in the bottom 12.5% while light orange between the bottom 12.5% and 37.5% of the data. For some indicators the colour scheme has been reversed, as indicated in Annex VII.

Figure 25: Dissemination of values and standards.

			EU27	Australia	Brazil	Canada	Switzerland	China	Indonesia	India	Japan	South Korea	Mexico	Norway	Russia	Turkey	UK	USA
Area 5A: Dissemination of values and standards -- values	Human rights*	2011																
		2021																
	Gender inequality index*	2005																
		2019																
	World press freedom index*	2013																
		2021																
	Control of corruption*	2005																
		2019																
	Voice and accountability*	2005																
		2019																
Civil society participation index*	2006																	
	2020																	
Importance of democracy*	2020																	
Area 5B: Dissemination of values and standards -- standards	Labour standards: Social protection benefits*	2020																
	Labour standards: Low pay rate*	2018																
	Environmental standards: GHG emissions	2010																
		2018																
	Environmental standards: Water stress*	2005																
		2018																
	Environmental standards: Energy transition index*	2012																
		2021																
	Product safety standards: product withdrawals	2012																
		2020																
	Global Food Security Index*	2012																
		2020																
	Share of national imports from world imports	2011																
		2018																
Share of inward FDI from global FDI	2010																	
	2020																	
FDI restrictiveness index*	2020																	

Cell colours indicate the relative position of a country-year cell among all countries considered in the reported years, from dark orange (worst) to dark blue (best). A white cell denotes a missing value. Stars indicate that the EU value refers to the median value across Member States.

Figure 26: International cooperation and soft power.

			EU27	Australia	Brazil	Canada	Switzerland	China	Indonesia	India	Japan	South Korea	Mexico	Norway	Russia	Turkey	UK	USA	
Area 6A: International cooperation	Development aid	2011	Dark Blue	Light Blue	White	Yellow	Yellow	White	White	White	Light Blue	Yellow	White	Light Orange	Dark Orange	Light Orange	White	Light Blue	
		2019	Dark Blue	Light Orange	White	Light Orange	Yellow	White	White	White	White	Light Blue	Yellow	White	Light Orange	Dark Orange	Yellow	White	Light Blue
	Share of patents with foreign partners	2011	Light Orange	Yellow	Yellow	Light Blue	Dark Blue	Light Orange	Dark Blue	Light Blue	Light Blue	Dark Orange	Dark Orange	Light Blue	Yellow	Yellow	Light Orange	Light Blue	Light Orange
		2017	Light Orange	Yellow	Yellow	Light Blue	Dark Blue	Light Orange	Dark Blue	Light Blue	Light Blue	Dark Orange	Dark Orange	Light Blue	Yellow	Yellow	Light Orange	Light Blue	Light Orange
	FDI stock to Africa	2015	Dark Blue	White	White	White	Light Orange	Light Orange	White	White	White	White	White	White	White	White	White	Light Blue	Yellow
		2019	Light Blue	White	White	White	Light Orange	Yellow	White	White	White	White	White	White	White	White	White	Light Blue	Light Orange
	Trade with Africa	2011	Dark Blue	Light Orange	Light Blue	Yellow	Light Orange	Light Blue	Light Orange	Light Blue	Light Blue	Light Blue	Yellow	Light Orange	Dark Orange	Light Orange	Yellow	Light Blue	Dark Blue
		2019	Dark Blue	Light Orange	Yellow	Light Orange	Yellow	Dark Blue	Light Orange	Light Blue	Light Blue	Yellow	Yellow	Light Orange	Dark Orange	Light Orange	Yellow	Light Blue	Light Blue
	Lending to Africa: debt outstanding	2010	Dark Blue	Light Orange	Yellow	White	Yellow	Light Blue	White	White	Yellow	Light Blue	Light Orange	White	Light Orange	Light Orange	Dark Orange	Light Blue	Light Blue
		2019	Dark Blue	Dark Orange	Light Orange	Light Orange	Yellow	Dark Blue	White	White	Yellow	Light Blue	Light Orange	White	Light Orange	Yellow	Light Orange	Light Blue	Light Blue
Area 6B: Soft power	Diplomatic posts*	2016	Dark Orange	Light Orange	Light Blue	Light Orange	Light Orange	Dark Blue	Light Orange	White	Light Blue	Yellow	Yellow	Light Orange	Dark Orange	Light Blue	Light Blue	Yellow	Dark Blue
		2019	Dark Orange	Light Orange	Light Blue	Light Orange	Light Orange	Dark Blue	Light Orange	White	Yellow	Light Blue	Yellow	Light Orange	Dark Orange	Light Blue	Light Blue	Yellow	Dark Blue
	Trust in global institutions: UN*	2007	Light Blue	White	White	Yellow	White	White	Dark Blue	White	White	Dark Orange	Light Blue	Light Orange	White	Light Orange	White	Light Orange	Light Orange
		2019	Yellow	Yellow	Light Orange	Light Blue	White	White	Light Blue	White	White	Light Orange	Dark Blue	Light Orange	White	Dark Orange	White	Light Blue	Yellow
	Passport Index*	2015	Yellow	White	White	Yellow	Dark Blue	Light Orange	Dark Orange	Dark Orange	Dark Orange	Yellow	Dark Blue	Light Orange	Light Blue	Light Orange	Light Orange	Dark Blue	Light Blue
		2021	Light Blue	Light Blue	White	Yellow	Dark Blue	Light Orange	Light Orange	Dark Orange	Dark Orange	Yellow	Light Blue	Light Orange	Light Blue	Light Orange	Light Orange	Yellow	Light Orange
	Nobel prize winners	1901-2020	Dark Blue	Yellow	Light Orange	Yellow	Light Blue	Light Orange	Light Orange	Light Orange	Light Orange	Light Blue	White	Light Orange	Light Orange	Yellow	Dark Orange	Light Blue	Light Blue
	Olympic medals	2016	Dark Blue	Yellow	Yellow	Yellow	Light Orange	Light Blue	Dark Orange	Dark Orange	Dark Orange	Light Blue	Yellow	Light Orange	Light Orange	Light Blue	Light Orange	Light Blue	Dark Blue
	FIFA ranking	2021	Light Blue	Light Orange	Dark Blue	Light Orange	Light Blue	Light Orange	Dark Orange	White	Dark Orange	Yellow	Light Orange	Light Orange	Light Orange	Yellow	Yellow	Light Blue	Yellow
	International arrivals	2019	Dark Blue	Light Orange	Dark Orange	Yellow	Light Orange	Light Blue	Light Orange	Light Orange	Light Orange	Light Blue	Light Orange	Light Orange	Dark Orange	Yellow	Light Blue	Light Blue	Dark Blue
	Museum visits	2019	Light Blue	Dark Orange	Light Orange	White	White	Dark Blue	White	White	White	Light Blue	Light Orange	Light Orange	White	Yellow	Light Orange	Light Blue	Light Orange
	World heritage sites	2019	Dark Blue	Light Orange	Yellow	Light Orange	Light Orange	Dark Blue	Light Orange	Light Orange	Light Blue	Light Orange	Light Orange	Light Orange	Dark Orange	Light Blue	Light Orange	Light Blue	Yellow
	Net trade in cultural goods	2010	Yellow	Light Orange	Yellow	Light Orange	Dark Orange	Dark Blue	Light Orange	Light Blue	Light Blue	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Blue	Yellow	Dark Orange
		2019	Light Blue	Light Orange	Yellow	Light Orange	Dark Orange	Dark Blue	Light Orange	Light Blue	Dark Blue	Yellow	Light Blue	Light Orange	Light Orange	Light Orange	Light Blue	Dark Blue	Dark Orange

Cell colours indicate the relative position of a country-year cell among all countries considered in the reported years, from dark orange (worst) to dark blue (best). A white cell denotes a missing value. Stars indicate that the EU value refers to the median value across Member States.

