CHAPTER 2

Sustainable growth and development in the EU: concepts and challenges

1. Introduction ([94])

Sustainability as a global concern emerged in the second half of the 20th century out of growing recognition of the detrimental impacts of economic development on the environment and human health. Sustainability refers to the ability of a system, organism or human-made product to endure indefinitely. The concept evolved out of "sustainable development", a term coined in 1987 by the seminal report issued by the World Commission on Environment and Development, chaired by Norwegian Prime Minister Gro Harlem Brundtland under the auspices of the United Nations. The report called sustainable development one "that strikes a balance between meeting the needs of the present without compromising the ability of future generations to meet their own needs."([95]) Related concepts emphasise the ultimate common goods and values that need to be sustained, as in "sustainable society": "one where economic growth is compatible with planetary boundaries and fairly distributed among its citizens."([96])

Sustainable development is one of the European Union's fundamental aims and a matter of international credibility. It is enshrined in Article 3.3 of the Treaty on the European Union (TEU), which states that "The Union shall [...] work for the sustainable development of Europe based on balanced economic growth and price stability, a highly competitive social market economy, aiming at full employment and social progress, and a high level of protection and improvement of the quality of the environment." Thus, according to the Treaty, sustainable development in the EU:

- presupposes enduring and inclusive economic growth;
- is based on macroeconomic stability without imbalances;
- should be pursued through a highly competitive "social market economy" (i.e. on a distinctly European model of economic policies ([97]) which promote fair market competition within a welfare state);
- should aim at full employment and social progress;
- should aim at protecting and improving the environment.

Sustainable development in the EU is understood as having three interlinked and equal dimensions – economic, social, and environmental. Underlying this view (illustrated in *Figure 2.1*) is the belief that "it is not possible to achieve a desired level of ecological or social or economic sustainability (separately) without achieving at least a basic level of all three forms of sustainability, simultaneously."([98]) The Europe 2020 strategy for "smart, sustainable and inclusive

([94]) This chapter was written by Katarina Jaksic, Jörg Peschner and Argyrios Pisiotis.

([95]) World Commission on Environment and Development (1987).

([96]) Falkenberg (2016).

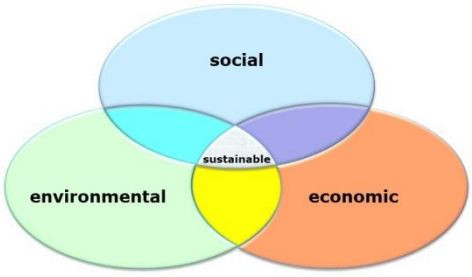
([97]) The "social" element of the model refers to support for the provision of equal opportunity and protection of those unable to enter the free market labour force because of old age, disability, or unemployment.

([98]) The view owes much to the corporate accounting term "triple bottom line," coined by business sociologist John Elkington (1997) and (1999), p.75.

growth", issued in early 2010, is also consistent with this tri-dimensional view of sustainable development.

Sustainable development has become a mainstream concept. It has been invoked by scholars, multinational business and advocacy groups, governments and multilateral institutions. In September 2015, the United Nations resolution on the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs, see *Figure 2.2*) marked the culmination of a process that has made "sustainability" the global framework for international and national development efforts in all their economic, social, environmental and governance dimensions.([99])

Figure 2.1
Sustainability as the intersection between environment, economy and society
Sustainability and its dimensions



Source: Authors' own presentation.
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Figure 2.2
SDGs require simultaneous and mutually reinforcing action towards three core objectives: economic growth, social inclusion and environmental protection
Sustainable Development Goals

Source: https://www.un.org/sustainabledevelopment/news/communications-material/
Click here to download figure.

The EU was one of the leaders in the formulation of the SDG agenda and has taken follow-up action towards its implementation. In 2017, the European Commission established the High Level Multi-stakeholder Platform on the SDGs, bringing together ideas for the Commission's Reflection Paper "Towards a Sustainable Europe by 2030."([100]) Issued on 30 January 2019, the Reflection Paper contributed to the wider debate on the 'Future of Europe', launched in March 2017 by European Commission President Juncker. It aimed at stimulating further reflection on the vision of a sustainable EU and a strategy for implementation of sustainable development goals. It complemented a series of other Reflection Papers launched before, including on the social dimension of Europe ([101]) and on Harnessing Globalisation. ([102])

Fast and bold common policy choices are needed for making the EU sustainable. A recent report by the European Commission's Political Strategy Centre points to "global existential challenges" which urgently required a common EU policy response. ([103]) In its

([99]) See the UN resolution at https://sustainabledevelopment.un.org/post2015/transformingourworld. The concept of resilience, initially used in engineering and environmental sciences, started being transferred to social sciences, where it has also become a paradigm or "perspective", moulding development action in national settings and international cooperation. See Folke (2006) and Brown (2014), pp. 107–117. In the EU, resilience has progressively gained prominence as a concept similar to the concept of sustainability. It can be defined as the "ability of the society to face shocks and persistent structural changes without losing its ability to deliver societal well-being in a sustainable way," while a "resilient society aims to sustain its level of individual and societal wellbeing in an intergenerationally fair distribution"; see Manca and Zec (2019) and Manca et al. (2017), p.6.

([100]) Accessible at https://ec.europa.eu/commission/sites/beta-political/files/rp_sustainable_europe_30-01_en_web.pdf .

([101]) The Reflection Paper on the Social Dimension of Europe discusses how to sustain our standards of living, create more and better jobs, equip people with the right skills and create more unity within EU society, in the light of major changes. See: European Commission (2017), Reflection paper on the Social Dimension of Europe, COM(2017) 206, 26 April 2017; accessible at https://ec.europa.eu/commission/sites/beta-political/files/reflection-paper-social-dimension-europe_en.pdf.

([102]) The Reflection Paper on Harnessing Globalisation discusses ways to protect and empower citizens through robust social policies and education and training support throughout their lives, as well as through progressive tax policies and investment in innovation. In external relations, the Paper posits the need to shape a truly sustainable global order, based on a multilateral set of global rules and a common agenda.

([103]) European Political Strategy Centre (2019). The paper provides an overview of the long-term structural trends accelerating and intersecting at EU level. These trends bear economic, technological, societal and governance-related risks. They include significant growth divergence between countries,

Reflection Paper, the European Commission outlined policy choices for setting the EU's economy on a path towards sustainability, while taking account of the inextricable links between the various dimensions of sustainability, each facing particular challenges. ([104]) It focuses on promoting a circular economy, sustainable production, consumption, including in the key agro-food sector, energy generation and consumption, and a socially fair transition to environmentally sustainable economic growth. The Paper also identifies domains in which policy action can have a horizontal enabling effect in fostering sustainable development. These are education, science, technology, research and innovation, financing, taxation and competition policies, corporate social responsibility and coming to terms with new business models, open trade, and effective multi-level governance.

This chapter reviews concepts of sustainability and identifies key implementation challenges. Different sections dedicated to: firstly, the concept of sustainability and its measurement, with a focus on the social dimension of sustainability; secondly, a factor analysis aimed at identifying the principal components of sustainable growth as well as synergies and trade-offs between the different dimensions of sustainable development; and thirdly, identifying the main challenges to social sustainability in the EU. These are addressed in detail in the subsequent chapters.

2. SUSTAINABILITY AS AN EU OBJECTIVE: DEFINING AND MEASURING THE SOCIAL DIMENSION

The social dimension of the EU is of fundamental importance. Whether subsumed directly under "sustainable development" or not, the scope of the social dimension is broadly delineated in the Treaties through explicit or implicit references to the following aspects: ([105])

- (social) justice;
- human dignity and equality;
- inter- and intra-generational solidarity;
- promotion of (high) employment;
- working conditions and their harmonisation across Member States;
- the improvement of living conditions and upward convergence in living standards;
- welfare states (indirectly through the stated preference for a "social market economy");
- the fight against social exclusion and discrimination;
- (proper) social protection;
- social dialogue;
- human capital development;
- gender equality;
- protection of the rights of the child;
- economic, social and territorial cohesion; and
- solidarity among Member States.

The EU aims for "inclusive growth", including through the implementation of its Europe 2020 strategy. As shown in Chapter 3, economic growth benefits from efficient product (and credit) markets and fair competition. This is important for allocating resources to their most productive use, and for incentivising innovation. However, the concept of inclusive growth is broader. For the EU, it includes empowering people through opportunities for all throughout the lifecycle: investing in skills in order to attain high levels of employment; fighting poverty and thus building a cohesive society; and sharing the gains of growth widely. For growth to be inclusive, labour markets need to be modernised, training and social protection systems adjusted to help people to anticipate and manage technological transformation and more frequent labour market transitions. In its Lisbon and Europe 2020 strategies, the EU anticipated the particular risks attached to Europe's ageing population and the need to make the fullest possible use of its labour potential to sustain growth and prosperity. In this context, promoting gender equality and facilitating the inclusion of people with disabilities is as much a measure of support for the EU's growth potential, benefiting all, as it is a matter of principle aimed at improving the lives of the individuals concerned.

The European Pillar of Social Rights gives prominence and visibility to the social dimension of sustainability. Proclaimed at the Gothenburg Social Summit of 17 November 2017 by the European Parliament, the Council and the Commission, the Pillar showed the commitment of EU institutions and Member States to work on all of the aforementioned aspects of the social dimension. The principles of the Pillar provide a compass for upward convergence towards more equal opportunities and access to the

regions and businesses; changing demographics and rising inequalities; unsustainable consumption patterns; societal unease with rapid pace of change; rising protectionism; and climate change.

([104]) See European Commission (2019c), p. 3, chart adapted from Kate Raworth's 'Donut of social and planetary boundaries' (2017).

([105]) All references are to either the Treaty on the European Union (TEU) or the Treaty on the Functioning of the European Union (TFEU). Article 2 TEU conveys the strong social content of the EU's shared foundational values. Article 3.3. TEU lists primary EU objectives emanating from these values (art. 2 TEU) and from the EU's fundamental goal (art. 3.1 TEU.) Article 151 TFEU elaborates on EU objectives related to human resource development, labour markets and social conditions.

labour market, fairer working conditions and more decent living conditions through social protection and inclusion. They can also be considered a "to do" list for promoting social sustainability.

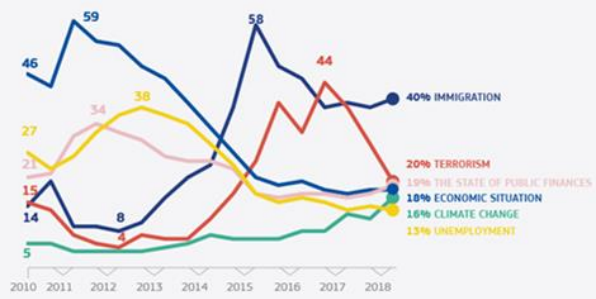
2.1. European citizens' views and expectations regarding sustainability

All three dimensions of sustainable development are high on the list of European citizens' preoccupations, while environmental concerns are gaining ground. According to the most recent standard Eurobarometer survey of autumn 2018, citizens regard migration as by far the biggest issue the EU is facing, but concerns about climate change and environmental sustainability are growing, while concerns about security, unemployment and the overall economic situation continue to decline (see *Chart 2.1*).

Chart 2.1

EU citizens' see migration, security and sustainability as the most important issues the EU is facing

Evolution of main challenges that the EU should address, identified by EU citizens



Note: Data are in percentage of EU-total respondents. Only the six most frequently chosen answers are represented in the graph.

Source: Eurobarometer, autumn 2018.

Click here to download chart.

However, the concerns of EU citizens at personal and national level continue to focus on household finances, purchasing power and employment outlook. Interestingly, when citizens are asked – in the same survey of 2018 - about their "most important concerns personally and nationally", the results look somewhat different (see *Table 2.1*). The top five concerns of EU citizens "for them personally" are: rising prices (32%), health and social security (17%), pensions (16%), the financial situation of the household (13%) as well as taxation, education and environment, climate and energy issues (all at 10%). Immigration (6%) and terrorism (3%), on the other hand, rank last in this survey. Main concerns at the national level mirror those at the personal level to a great extent with unemployment heading the list, followed by rising prices, immigration, health and social security and the economic situation. While depending on multiple factors, the discrepancies in reported EU-level, national level and personal concerns accompany the observed divergences between EU aggregate indicators and individual perceptions.

Table 2.1

EU citizens' personal and national challenges differ significantly from those facing the EU and remain predominantly focused on social issues

Most important issues that the EU and citizens personally are facing (both in the view of citizens)

Rank (% of respondents)	Main concern at national level	Most important issue citizens are facing personally
Immigration	**3** (21%)	15 (6.0%)
Terrorism	13 (8%)	16 (2.7%)
State of public finances	11 (10%)	
Economic situation	5 (15%)	11 (8.1%)
Climate change	7 (14%)	6 (10.3%)
Unemployment	**1** (23%)	7 (9.9%)
Rising prices	**2** (21%)	**1** (31.7%)
The environment	7 (14%)	6 (10.3%)
Crime	8 (12%)	14 (6.1%)
Pensions	6 (15%)	**3** (15.9%)
Energy supply	7 (14%)	
Taxation	13 (8%)	5 (11.7%)
Health and social security	**4** (20%)	**2** (16.9%)
Household finances		**4** (13.2%)
Education systems	10 (11%)	8 (9.8%)
Working conditions		9 (8.6%)
Living conditions		10 (8.4%)
Housing	9 (11%)	13 (6.9%)

Note: Data are percentages of EU total respondents. Responses regarding main challenges at national level are based on pre-defined answer categories; responses regarding main challenges faced personally are based on free answers without pre-defined categories. The top four responses in each category are listed in bold and in colour.

Source: Eurobarometer, autumn 2018.

Europeans also see the need for modernising and strengthening social welfare systems in the EU. Whereas welfare systems are within the competence of Member states, it is worth noting that almost two thirds of the citizens surveyed by Eurobarometer favour harmonising social welfare systems within the EU, a two-point increase on the previous year. One in four (26%) are opposed to this.

2.2. Measuring (social) sustainability

Measuring and assessing (social) sustainability are still in their infancy. The realization of the need for such a measure is not new. The "Commission on the Measurement of Economic Performance and Social Progress", ([106]) admitted the difficulty of devising measures that can accurately determine whether current levels of well-being can be maintained for future generations. The report emphasised that the assessment of sustainability is complementary to the determination of current economic performance or well-being and should be measured separately. The authors warned against combining measures of

([106]) The Commission, established by former President of France Nicholas Sarkozy in 2008, was coordinated by Nobel laureates Joseph Stiglitz and Amartya Sen and French economist Jean-Paul Fitoussi.

current well-being and sustainability into a single indicator or confusing the former with the latter. This means that measurement of sustainability in the employment and social domains cannot be tantamount to the measurement of current performance in these domains, based on familiar stylised indicators.

Measuring sustainability requires a methodology based on "stocks", "flows" and "thresholds." The report of the "Stiglitz Commission" concluded that any assessment of sustainability, in the economic, environmental or social dimensions, requires a dashboard of indicators partly reflecting the methodology of the environmental sciences. This methodology would represent the variability of the "stocks" to be sustained, i.e. quantities and qualities of natural, physical, human, and social capital. It would also monitor "flows" in and out of these stocks and establish threshold values for each stock "beyond which [adverse effects] would be highly detrimental to future well-being" ([107]).

The social dimension of sustainability has commonly been measured through stylised indicators of labour market and social outcomes. These are indicators such as employment, activity and unemployment rates and their breakdown components, Gross Disposable Household Income and its distribution, ([108]) the rate of people at risk of poverty and social exclusion and its breakdown components, in-work poverty, gender gaps, etc. ([109]) This stems from the relative difficulty of suggesting a definition of social sustainability that would gain widespread visibility and political acceptance, as has happened with environmental sustainability. This simple yet practical approach could be complemented with the measurement of the forward-looking dimension of the desired performance under each such indicator. It also foregoes any attempt to explore the interplay between indicators and whether and how they reinforce each other.

The EU's SDG indicators offer an extensive view of the evolution of the social dimension. Yet they concentrate on trends and outcomes rather than assessing the sustainability of current well-being. From 2017 onwards, the Commission carried out regular monitoring of the SDGs in an EU context, developing a reference indicator framework for this purpose and drawing on the wide range of ongoing monitoring and assessment across the Commission, Agencies, European External Action Service and Member States. ([110])

A focus on "common goods" and "capabilities" could further enrich the approach of social sustainability. The concept of functional "capabilities" builds on the premise that the citizens' established rights to certain public goods are meaningless without active measures by governments to enable citizens to exercise these rights. These include economic facilities and social opportunities, such as education and healthcare, which allow people to live better lives and realise their potential.([111]) The capabilities approach has become a predominant paradigm for policy in human development, inspiring the creation of the UN's Human Development Index, which captures health, education, and income capabilities. ([112]) The strengths of the capabilities approach are: a) the emphasis of welfare economics on subjective individual choices; b) the contextualisation of development efforts in a specific society with its regulatory, institutional and legal aspects; and c) the possibility of weighting indicators of development according to people's situation in life.

The Social Scoreboard accompanying the European Pillar of Social Rights offers a framework for measuring social sustainability in the EU. Although measuring social sustainability does not have to mimic methods developed for the environmental dimension, monitoring flows in and out of the existing stocks can be crucial to policy. Ascertaining the positive or negative direction of an indicator's evolution can assist policy target setting to influence the direction and speed of this evolution. ([113]) The European Semester uses the Social Scoreboard to monitor performance in the social dimension (see *Annex 1*).

3. IDENTIFYING THE PRINCIPAL COMPONENTS OF SUSTAINABLE DEVELOPMENT: A FACTOR ANALYSIS

The previous section shows that the concept of 'social sustainability' is not clear-cut. The empirical analysis in this chapter therefore starts by attempting to refine and realise the concept. This section seeks to complement previous efforts to operationalise the social dimension in two ways:

([107]) Stiglitz et al (2009), p. 266.

([108]) Income distribution is typically measured using the Gini-coefficient and the S80/S20 ratio.

([109]) This approach is similar to that of Eurofound in the project titled "Developing a conceptual framework to monitor convergence in the European Union." See Mascherini et al. (2018).

([110]) European Commission, 2016a, p. 16; See also Eurostat (2018b).

([111]) The capabilities approach developed out of the collaboration of development economists Amartya Sen, Sudhir Anand and James Foster and philosopher Martha Nussbaum. See Sen *(2001) and (2010), pp. 195–220, Nussbaum and Sen (1993).*

([112]) The Human Development Index (HDI) is a statistic composite index of life expectancy, education, and per capita income indicators, which is used to rank countries into four tiers of human development. A country scores a higher HDI when the lifespan is higher, the education level is higher, and the GDP per capita is higher.

([113]) This is particularly true since many social system characteristics (e.g. human capital development, social networking, leadership) allow for both adaptation and transformation of human production, consumption and conservation activity. See Apgar et al. (2015), cited in Johnson et al. (2018), p. 15.

Box 2.1: Explorative Factor Analysis

The factors are being extracted from the original dataset, following two rules:

- The extracted factors themselves are uncorrelated (orthogonal) so that they reflect different dimensions of social sustainability (are independent of each other).
- Extraction happens in a way as to maximise correlation of a factor with some variables while minimising correlation with other variables. This makes it possible to interpret each factor as each factor can be related to certain variables.

The correlation between the factors and the original variables is called 'factor loading'.

Firstly, it seeks synergies between the different aspects of the social dimension, as represented by the principles of the Social Pillar. In other words, it explores whether and which of these aspects/principles reinforce each other.

Secondly, it extends the quest for synergies beyond the social dimension, to the other two dimensions of sustainability — the environmental and economic.

The objective of the analysis is to identify the principal components of sustainable development. These bind together the social, environmental and economic dimensions. The principles of social sustainability are listed in the previous section. If they are pursued without paying attention to the constraints imposed by environmental and economic concerns the EU risks making progress on one dimension at the expense of the other two. To mitigate such risks, it is crucial to pursue improvements in the social dimension by capitalising on potential synergies with the other dimensions. The analytical framework usually used for this kind of question is an explorative Factor Analysis (FA), also called 'Principal Component Analysis' (see *Box 2.1*). ([114])

A factor analysis identifies groups of inter-correlated macro, social and environmental variables. ([115]) In the present case, the first step was to identify all the country-level variables deemed relevant to describing the core dimensions of the UN Sustainable Development Goals. The next step was to reduce this list of more than 400 variables to a manageable set of indicators. ([116]) This reduced final list contains variables that correlate highly with others which have been eliminated in the reduction process. *Annex 2* presents a table of non-included variables together with their correlations with the factors. ([117]) A further step was to use information about cross-country correlations between these variables to find out whether there are common drivers behind them. Those are the factors, or principal components, of sustainable development, with a focus on the social dimension.

The final list of indicators taken into account for the factor analysis is shown in *Table 2.2*, first column. It comprises 45 indicators from very different sources, distributed across six broad themes (policy areas) that are considered relevant to people's well-being: (1) the labour market situation in the respective country, (2) the availability of job-related skills and qualifications, (3) the macro-economic conditions, (4) the social outcomes, (5) the welfare state and institutions, and (6) the environmental conditions. The table also displays the Sustainable Development Goals covered by the respective theme. *Annex 2* explains variables and their data sources, indicating why they were included.

([114]) See, for example, Backhaus et al (2008), Ch. II.7.

([115]) See European Commission (2011, p. 210). The ESDE 2011 had used the same methodology in the context of identifying the main dimensions of Active Ageing.

([116]) Starting out from several hundred variables, the final list is the outcome of numerous rounds of reduction of redundant variables, or adding of new variables, based on the themes they cover and the contribution they made to the overall model's explanatory power.

([117]) That is, these variables were taken into account although they were technically not part of the model.

Table 2.2

Sustainable development can be summarized through four main factors

Four factors extracted from 45 labour market, social and institutional variables

No.	Original Indicator	Factor: Human capital and effective institutions favour productivity	Factor: Degree of labour market (in-) efficiency	Factor: Effective welfare states favour good social outcomes	Factor: Limits to growth, costly labour, high social expenditure	Sum over squared loadings (indicator's communality)	Data source
	Labour Market						
1	Employment rate of population aged 20-64 - total		-.83			.86	1
2	EDR - Economic Dependency Rate 15+ (Population/Employment - 1)		.85			.84	1
3	Unemployment rate of labour force 15+		.77			.70	1
4	NEET rate for population aged 15-24 - total		.57			.71	1
5	Involuntary temporary employment as % of total employees 15-64		.64			.45	1
6	Job tenure in years (15-64)		.80			.68	1
7	Self-employment – Share of self-employed workers among overall employment		.70			.57	1
8	Unemployment gender gap (20-64)		.83			.72	1
9	Share of adult population (aged 25-64) with upper secondary or tertiary education - total		-.53			.53	1
10	Job satisfaction		-.70			.80	9
11	Statement: "Difficult to fufil family responsibilities because of time spent on job"	-.79				.70	9
	(Job) Skills						
12	Share of employment in professional, scientific, and technical activities; administrative and support activities	.74				.58	1
13	Share of employment in care and health care activities	.84				.83	1
14	Individuals who have basic or above basic overall digital skills	.75				.82	12
15	Life long learning - percentage of adult population (aged 25-64) participating in education and training	.72				.74	1
	Macroeconomic environment						
16	Government Gross Debt		.87			.81	2
17	Nominal unit labour cost - growth over 3 most recent periods		-.59			.87	2
18	Average real GDP growth over 3 years				-.92	.88	2
19	Labour productivity growth - GDP per employed person - growth over 3 most recent periods				-.75	.65	2
20	Country's export share in GDP				-.57	.45	2
21	Labour Productivity in percent of EU-28 average	.89				.85	2
22	GDP per capita in EURO in percent of EU-28 average	.88				.83	2
	Social outcomes						
23	Poverty threshold (60% of median income) - value of threshold (in PPS)	.92				.88	3
24	At-risk-of poverty rate (60% of median income			-.92		.92	3
25	Severe material deprivation rate (can't afford 4 and more items)	-.64		-.50		.69	3
26	In-work poverty - total			-.75		.65	3
27	At-risk-of poverty rate of children (aged 0-17)			-.87		.86	3
28	S80/S20			-.87		.88	3
	Welfare state and institutions						
29	Social protection expenditure in % of GDP - Social protection benefits, total	.66			.57	.93	4
30	Social protection expenditure in % of GDP - Old age				.65	.81	4
31	Impact of social transfers (incl pensions) in reducing poverty			.81		.80	4
32	Tax wedge, earnings 100%, single				.65	.43	5
33	Trade union density	.56				.36	5
34	Bargaining coverage rate (ICTWSS)	.73				.73	6
35	Coll. Bargaining at Sectoral or Regional level ECS	.67				.69	7
36	Voice and Accountability	.89				.88	8
37	Government Effectiveness Index	.81				.90	8
38	Rule of Law Index	.81				.93	8
39	Control of Corruption Index	.83				.92	8
40	Child care – Children cared for (by formal arrangements other than by the family) (age 3 to mandatory	.68				.52	3
41	Perceived independence of the justice system - Index	.74				.68	10
42	Population with confidence in EU institutions by institution - Index		-.55			.49	10
	Environment						
43	Energy productivity	.74				.79	11
44	Resource productivity and domestic material consumption	.77				.66	11
45	Municipal waste recycled and composted 2014	.71				.68	11
	Sum over squared loadings (Factor's Eigenvalue)	14.6	8.5	5.6	4.3	Sum: 33.0	

Data Sources:

1 Eurostat EU Labour Force Survey (2017)
2 Annual Macro-Economic Database of the European Commission (AMECO, 2017)
3 Eurostat EU Survey of Income and Living Conditions (2017)
4 European system of integrated social protection statistics (ESSPROS, 2015)
5 OECD
6 Database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (2013)
7 European Company Survey (2013)
8 Worldwide Governance Indicators (World Bank, 2017)
9 European Quality of Life Survey (Eurofound, 2016)
10 European Commission, DG Communication
11 Eurostat, Sustainable Development Indicator for the EU (2016, 2017)
12 European Commission, DG Communication Networks, Content and Technology

Note: The overall variability of the model is normalised to a value of 45, i.e. 45 variables with a standardised variance of one each.
Summing up the (squared) loadings along one variable gives the variable's communality. It denotes the percentage of this variable's cross-country differences that all four factors manage to explain.
Summing up the (squared) loadings over one factor gives the factor's Eigenvalue. It denotes the percentage of all original variables' cross-country differences that each factor can explain.
The sum over all four Eigenvalues is equal to 33.0, equal to the sum over all 45 communalities. The four factors thus explain 73% (33/45) of the cross-country differences between the 45 original variables.

Source: DG EMPL calculation based on Eurostat: EU LFS, EU SILC National Accounts; Eurofound: EWCS, ESS; ICTWSS database (University of Amsterdam).

Click here to download table.

3.1. The principle components of sustainable development

The right part of *Table 2.2* presents each of the four factors as they were extracted from the analysis (columns). The table shows how each factor correlates with each original variable - the so-called factor loadings. Only those higher than 0.5 are shown. The following observations can be made:

Factor 1: Human capital and effective institutions favour productivity.

Countries scoring high on the first factor also tend to

- score high on all skill-related variables. In other words, the first factor correlates strongly with skills;
- score high on productivity, GDP per capita and income (60% of median income is used as the poverty threshold);
- score high on variables that indicate high coverage of workers by collective bargaining. In other words, workers benefit from coordinated (as opposed to individual) bargaining over working conditions as members of trade unions. Factor 1 also correlates positively with favourable indices of corruption, accountability, the rule of law and government effectiveness, signalling trust in the functioning and effectiveness of government institutions;
- score high in terms of social expenditure;
- score high on 'green' indicators that may indicate prior investment in energy productivity and resource efficiency of production.

Factor 1 is the factor with the highest explanatory power. It explains the biggest share (44%) of the cross-country differences in the 45 original variables included. Henceforth it is referred to as "Human Capital" (unless otherwise noted).

Factor 2: Labour market efficiency is a precondition to sustainable development.

This factor has a negative connotation. A high score signals less favourable outcomes. Countries scoring high on Factor 2 show:

- low employment outcomes (and high unemployment) for different groups of workers;
- signs of imperfect labour markets in the form of strong labour market dualities, with privileged insiders and certain groups at a high risk of being (and remaining) outsiders. A high Factor 2 score implies high job tenure, a high level of involuntary temporary work, a high share of self-employment, a low share of at least medium-educated people and low overall job satisfaction;
- signs of adjustment to persistently unfavourable labour market situations. A high Factor 2 score combines high government gross debt (reflecting long-standing structural problems) and low wage dynamics;

Factor 2 explains 26% of the original dataset's cross-country differences. Henceforth it is referred to as "Degree of labour market (in-)efficiency".

Factor 3: Favourable social outcomes.

- Factor 3 has a strong negative correlation with all poverty-related and inequality-related variables. A high score in Factor 3 implies very favourable social outcomes.
- At the same time, in countries scoring high on Factor 3, social transfers tend to be effective in reducing poverty.

This factor explains 17% of the original variables' overall cross-country variance. Henceforth, factor 3 is referred to as "Effective welfare states favour good social outcomes".

Factor 4: Regulatory barriers, high taxes and inefficient social expenditure represent important 'limits to growth'.

The fourth factor correlates with only a few variables and therefore contributes least to the overall variance (13%). However, it is included because it is effective in capturing growth and labour taxation characteristics. Countries scoring high on Factor 4:

- show low recent productivity-growth and hence GDP growth rates;
- tend to show high tax wedges on labour which, together with lower export shares in GDP, may reflect competitiveness problems in some countries;
- spend much of their GDP on old-age-related social protection, which implies little investment in the current workforce;

First conclusions

Before considering how countries perform on the four factors, some important findings can be derived from the way factors emerge from the comprehensive original dataset and how they reinforce each other. Comparing countries' performance on the four factors, it seems that:

- **Skills go hand in hand with higher productivity.** Effective and trustworthy political and labour-market institutions further reinforce this link. Countries where this is the case are also in a position to invest more in social welfare in a more efficient use of natural resources. Factor 1 provides evidence that policies focusing on human

capital and social and environmental sustainability create trust and favour (rather than hinder) economic efficiency.

- **Structural inefficiency in the labour market, if not tackled, accumulates over time.** It can thus lead to internal devaluation in the form of low wage increases and subdued employment prospects.

- **High effectiveness of welfare spending goes hand in hand with lower poverty rates and lower inequality.**

- **Regulatory barriers may hamper productivity growth and a high tax wedge on labour raises labour costs and reduces workers' take-home pay**. Both may thus lead to lower rates of economic growth. ([118]) This may be the case for Member States where income levels are already high and where certain social and institutional standards have been developed over past decades, the financing of which requires higher labour taxes. To the extent that high labour taxes are needed to guarantee high social standards, this could hint at problems of competitiveness that may arise in the future. Yet countries like the Nordic Member States, Germany and Austria score well on both the Human Capital (Factor 1) and Limits to Growth (Factor 4) factors. That is, they combine high social standards with high productivity.

3.2. A taxonomy of sustainable social development in the EU

Based on the components (factors) of sustainable development identified it is possible to show how Member States score on each of the factors. It appears that in some countries the foundations of sustainable development have been laid. In others, there seem to be shortcomings in one or more dimensions of sustainability. A Cluster Analysis (CA) seeks to build a hierarchy of groups (clusters) of countries based on the similarity or dissimilarity of their scores on all four factors. ([119]) *Chart 2.2* plots the first two factors against each other. They are the strongest factors in the sense that they represent 70% of the total variation on all four factors. The colours chosen for the chart reflect the clusters identified for Member States, based on all four factors. Factor values are standardised to ensure that a value of zero reflects the (unweighted) average across all countries. The factor scores of certain smaller countries do not allow them to be assigned to any of the broader clusters. ([120]) The following findings emerge:

There is structural labour market inefficiency in the South of Europe. Southern Member States show clear signs of segmented labour markets, with high unemployment and low employment performance of vulnerable groups such as young people, women, or people with only low-level qualifications. Workers' bargaining power has generally weakened in these countries, especially for workers on non-standard contracts, so it may be difficult for them to push effectively for higher wages.

There is an East-West divide in terms of institutions. Almost all eastern Member States ([121]) (EU-13, green and blue) are on the left side of the chart, while western Member States (EU-15) are on the right. ([122]) The eastern EU countries tend to perform less well on the Human Capital factor (which also captures productivity and effectiveness of institutions). They are still in the process of catching-up economically with western Member States, with labour productivity and per-capita GDP not yet reaching the same standard. The culture of social dialogue appears less developed as the share of workers covered by collective bargaining tends to be lower than in western Member States. In addition, in a number of eastern Member States trust in the functioning of labour market institutions is significantly lower. Finally, these Member States face relatively large environmental challenges and/or struggle with an investment gap in pollution abatement.

([118]) Earlier model-based Commission analysis on the allocative impact of higher labour taxes confirms this finding. See ESDE 2016.

([119]) The method is called "hierarchical clustering", where the Ward-methodology is being used. See Backhaus et al (2008), pp. 420ff, European Commission (2011), p. 212.

([120]) Ireland and Malta are distant outliers on the 'Limits to Growth' dimension (which complicates this factor's interpretation). They show by far the highest GDP and productivity growth and are among the countries with the lowest tax wedge for labour. Hence, these countries gain competitiveness through low taxation and (especially in the case of Ireland) low growth in labour costs. One should also consider a certain upward bias in Ireland's GDP measurement, reflecting the impact of mere changes in accounting practices of multinational companies. Luxembourg has a highly competitive and particularly large financial sector (European Commission (2019a). It pushes Luxembourg's score on the Human Capital dimension to the top. Its small open economy is highly exposed to global competition and shows by far the highest export share in GDP and the highest per-capita GDP in the EU.

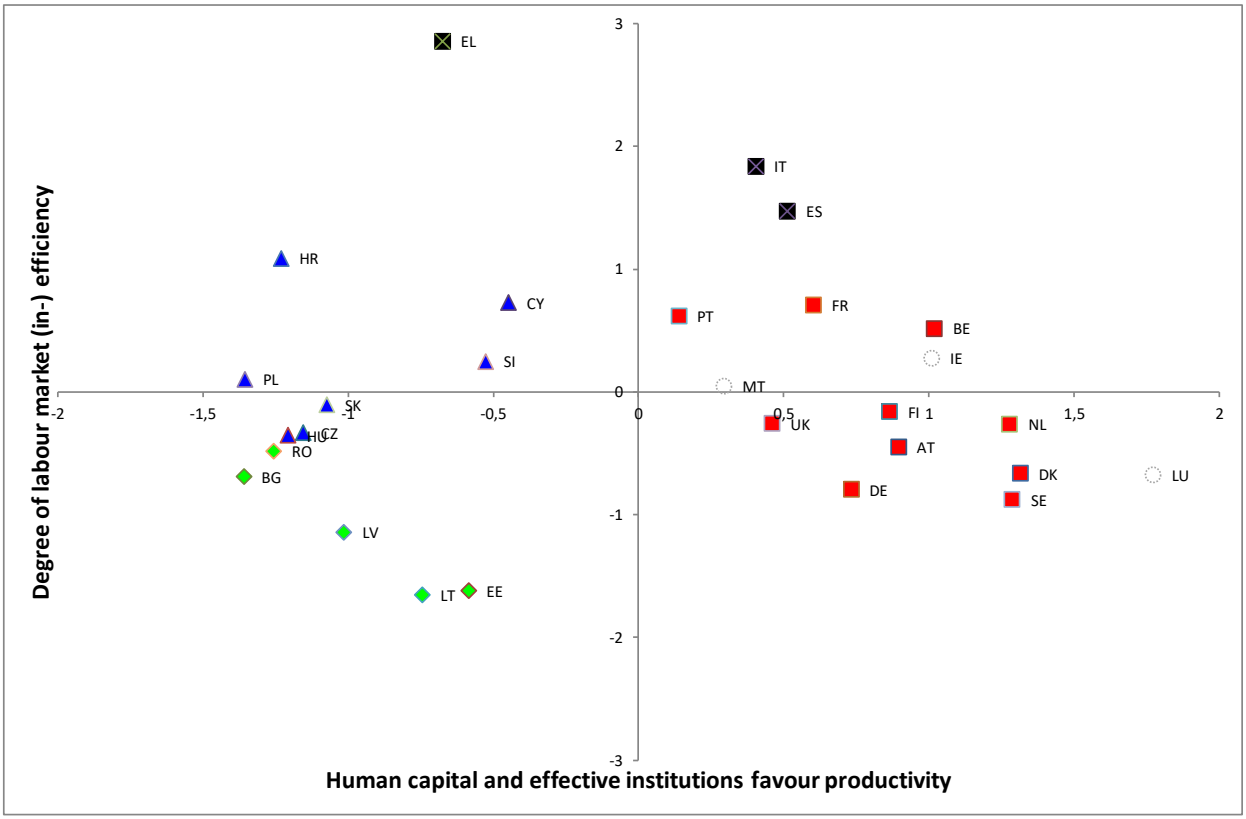
([121]) For the purpose of the analysis, "eastern" Member States are considered those that acceded in the EU in 2004 or later (EU-13).

([122]) "Western" Member States are those 15 countries that made up the EU before the 2004 enlargement (EU-15).

Chart 2.2

A South-East-West divide

The components of Sustainable Development (factors 1 and 2)



Note: Luxembourg, Ireland and Malta are not assigned to any of the clusters.

Source: DG EMPL calculations

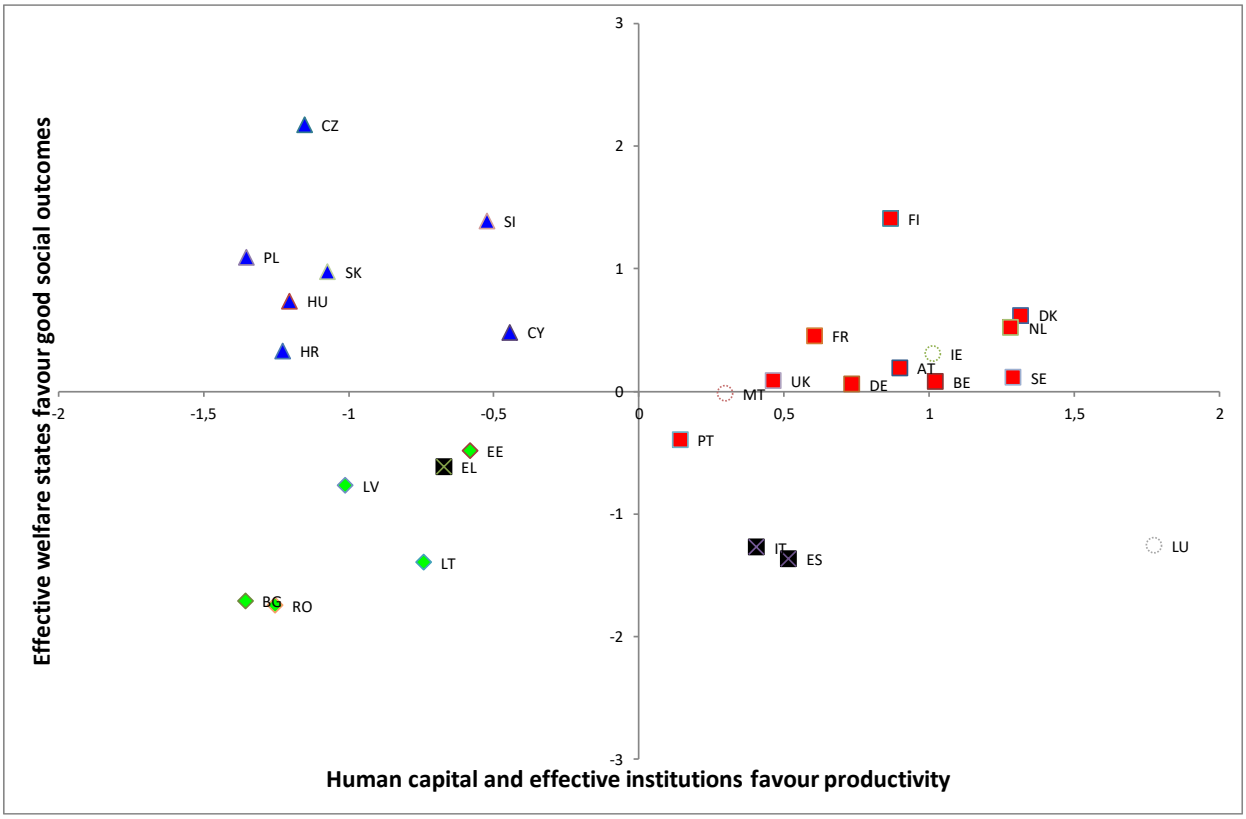
Click here to download chart.

Southern Europe and parts of eastern Europe face challenges as regards social outcomes. The clustering procedure assigns the Baltic States as well as Romania and Bulgaria to one cluster (green), separate from other eastern Member States (blue). These eastern European Member States are less affected than the southern cluster by labour market segmentation (vertical on *Chart 2.2*). Yet, like the southern cluster, they show relatively unfavourable scores on factor 3 "Effective welfare state favours good social outcomes". This factor captures Member States' performance on indicators related to inequality, poverty, and the potential for social transfers to reduce poverty. Factor 3 is shown on the vertical axis of *Chart 2.3* where it is plotted against the "Human Capital" factor.

Chart 2.3

A diverse eastern European pattern

The components of Sustainable Development (Factors 1 and 3)



Note: Luxembourg, Ireland and Malta are not assigned to any of the clusters.

Source: DG EMPL calculations.

Click here to download chart.

4. Social Sustainability in the EU: Challenges, Synergies, Trade-offs

The Reflection Paper "Towards a sustainable Europe by 2030" states that "sustainable development is about upgrading people's living standards by giving people real choices, creating an enabling environment" and leading to "a situation where we are living well within the boundaries of our planet through smarter use of resources and a modern economy that serves our health and well-being". ([123]) This section looks at where the EU stands today and which issues are particularly challenging on the EU's path to achieving this declared vision of balanced development. Specifically, the section examines the synergies and trade-offs between the different sustainability dimensions, which the factor analysis has already identified, by confirming and expanding upon them with examples from literature and some key findings from the subsequent chapters.

4.1. The Social-Economic Nexus

Decades of economic growth have brought steady improvements in living standards in the EU. On average, Europeans today live longer than ever before and are better educated. However, the economic recession represented a major setback in terms of employment and social inclusion, including poverty. Since the recovery, employment has grown strongly again, severe material deprivation has decreased, while activity rates have continued their long-term upward trend. The crisis and its aftermath made it clear that employment and social goals cannot be disconnected from broader growth objectives.

While public finances currently have some room for manoeuvre, long-term (economic and social) sustainability remains an issue. After substantial de-leveraging and reinforced fiscal discipline to safeguard financial stability, EU level debt is forecast to fall to 78.8% of GDP in 2020, 10 pp. lower than its peak in 2014 but more than 20 pp. higher than its pre-crisis low. The overall deficit for 2019 and 2020 is forecast to remain below 1% of GDP. ([124]) However, in high-debt countries fiscal buffers need to be further reinforced to create fiscal space for stimulating growth during the economic slowdown while at the same time investing in social and environmental sustainability. For example, welfare systems need to be sufficiently robust to cushion the impact the ageing of the society may have on economic growth and higher demographic dependency. ([125]) Welfare systems also need to fund better protection and empower people to make the most of labour market

([123]) European Commission (2019c).

([124]) European Commission Spring Economic Forecast 2019 (no-policy assumption).

([125]) European Commission (2017b): ESDE2017, Chapters 2 and 4.

opportunities. In this context, the quality, effectiveness and composition of public spending is of paramount importance and difficult reforms to public spending and taxation may therefore be needed.([126]) Efficient tax systems incentivise investment in areas that foster productivity and equity, thus supporting growth. In the absence of such structural reforms, ageing-related expenditure (pensions, health and long-term care) is projected to exert significant long-term pressure on the public budgets of a majority of Member States.

Labour markets and productivity

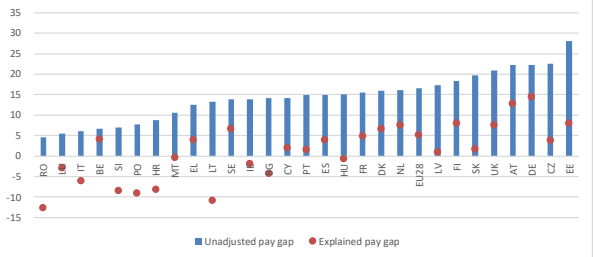
Current employment levels are at a record high but further gains depend on the ability to provide quality jobs. The margin for further gains is largest for groups currently facing difficulties in participating in the job market, such as young people, the low-skilled, the elderly, the disabled, migrants and marginalised communities. The prolonged detachment from work of many young people and migrant women in particular can have negative consequences for potential growth and be disadvantageous for the individuals concerned; they face skill depreciation and a higher risk of poverty and social exclusion later in life.

Gender gaps persist across the board, weighing down on the sustainability of both economic growth and social cohesion. These gaps encompass employment rates, pay, caring and household duties, part-time work and pension entitlements. The gender employment gap illustrates the mixed progress achieved in reducing gender gaps. While the gender employment gap remains stable at EU-level, it has widened in 11 Member States. In addition, the higher educational attainment levels of women, coupled with their over-representation in jobs below their qualification and skill levels, represent a clear productivity loss for the economy. In 2014, female workers earned 16.6% less than male workers on average (see *Chart 2.4*). Women working more frequently in lower-paying sectors and occupations can explain part of this gap. In some Member States, however, the average characteristics of the female workforce are more favourable than those of the male workforce and female workers would be expected – all else being equal – to earn more than men if they were remunerated on the same basis. ([127])

Chart 2.4

The gender pay gap is high and cannot be explained only by the characteristics of the female workforce

Unadjusted gender pay gap (% of average gross hourly earnings of men) and the 'unexplained' proportion of the gap, in hourly wages (2014)



Note: The unexplained pay gap is the gap that cannot be explained by differences in the average characteristics of the male and female workforce (age, education, occupation, job experience, employment contract, working time, enterprise characteristics). Countries are sorted by unexplained pay gap. Only unadjusted gender pay gap are considered official statistics.

Source: Figures from Eurostat (2018), Decomposition of the unadjusted gender pay gap using Structure of Earnings Survey data. (2014 wave).

Click here to download chart.

Similar to labour market participation, productivity growth becomes ever more important. To maintain and improve standards of living, the EU economy needs to remain competitive and resilient to shocks. ([128]) High productivity growth contributes to competitiveness and competitive economies are more likely to grow sustainably and inclusively. ([129]) Projected demographic trends indicate that productivity growth will become the main source of economic expansion in the long term. Policy-induced changes leading to both higher fertility rates and increased net immigration, if well managed, would also be beneficial to economic growth. ([130]) This requires continuous structural reforms and investment in both human and physical capital. Equality of opportunities and adequate mechanisms for redistribution through tax benefit systems need to be in place to allow everyone to benefit from economic growth. In addition to generating higher productivity growth, enhancing human capital improves social mobility, supports living conditions and improves people's employability across generations. ([131])

Investment in human capital is crucial. This is demonstrated by the factor analysis and is one of the main findings of the regional and firm-level analyses of Chapter 3. The efficient use of productive factors largely depends on firms' human capital: workers' qualifications, their access to training as well as more transversal elements, such as the workers' potential to innovate or to transfer knowledge across regions and companies. Fast-changing technological frontiers further accentuate the need for well-skilled labour. In general, investment in human capital through the life cycle gives workers access to the resources they need to be successful in the labour market. ([132]) These policies benefit society because they aim to contain

([126]) European Commission, Annual Growth Survey 2019.

([127]) This holds for countries where the explained part of the gender pay gap is negative. The Member States where the largest proportion of the gap is explained by the different average characteristics of the female workforce are Germany, Austria, the Netherlands, Finland, and Denmark. See also ESDE 2018, Chapter 4, pp. 123-126.

([128]) For recent work by European Commission services on resilience, see Bencur (forthcoming).

([129]) World Economic Forum.

([130]) See European Commission (2017b): ESDE (2017), Chapter 2.

([131]) European Commission (2018): ESDE 2018, Chapter 3.

([132]) ESDE 2018, Chapters 2 and 3.

costs by preventing social risks rather than compensating for them ex-post. In its productive function, social investment promotes higher participation in the labour market, employment and productivity, work-life balance and longer working lives; it provides incentives for skills acquisition and reskilling, thus smoothing out transitions in the labour market (see Chapter 4).

Social outcomes and social protection

Poverty and social exclusion reflect a lack of resources to ensure a sustainable livelihood, as well as limited access to education and other basic services. Supported by robust economic and employment expansion, the proportion of people at risk of poverty or social exclusion fell below pre-crisis levels to 22.5% of the total population in 2017, representing 113 million people. The decrease was driven by lower numbers of people in severe material deprivation and/or in very low work intensity households. However, there are large differences between Member States. The residual effort necessary to reach the 2020 poverty and social exclusion reduction target at EU level remains considerable. Social risks can emanate from social isolation and the instability that can accompany changing lifestyles and smaller families. For example, one-person households stand a much higher risk of poverty than the entire population. ([133]) In 2015, they accounted for a third of all households in the EU.

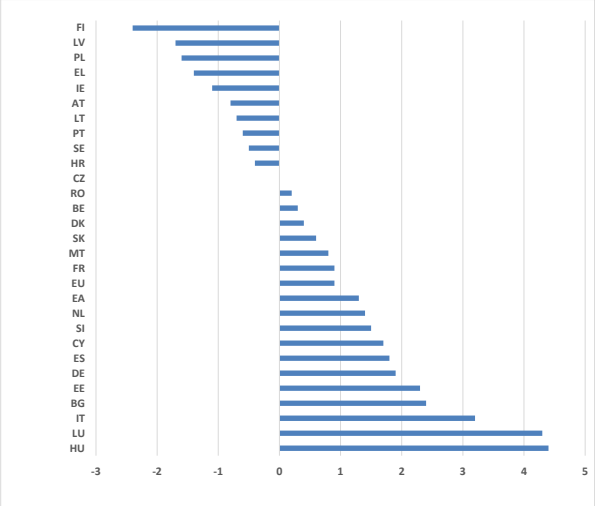
Work does not always protect from social risks. Working poverty in the EU affected 9.6% of the employed in 2017, up from 8.5% in 2008. Although it has slightly declined in the last two years, since 2014 the in-work poverty rate has oscillated higher than before the crisis. From 2008 to 2017 in-work poverty increased in the majority (16) of Member States (see *Chart 2.5*), indicating that work is less of a guarantee of a secure, adequate income than before the crisis.

([133]) At-risk-of-poverty rates for the EU-28: 26% for single person, 16.9% for the whole society (2017). Source: Eurostat EU SILC.

Chart 2.5

From 2008 to 2017, in-work poverty increased in the majority of Member States

Change in in-work poverty rate, percentage points, 2008-2017



Source: Eurostat, ilc_iw01.

Click here to download chart.

Income inequality and inequality of opportunities may negatively impact medium- and long-term growth. While higher productivity tends to be rewarded by higher wages, equality of opportunities and adequate mechanisms for redistribution through tax benefit systems need to be in place to enable everyone to benefit from economic expansion and thus enhance the human capital stock necessary to sustain economic growth for the long duration. ([134]) Inequality of opportunities, notably in access to quality education and training, remains a pressing issue in the EU and contributes to weaker upward social mobility. People with highly educated parents are much more likely to have a higher education themselves than those from families with low levels of education.([135]) The negative consequences of inequality on social outcomes have been fully identified by research.([136]) Furthermore, failure to deliver inclusive growth increases the difficulty of building a political consensus around structural reforms. ([137])

Social sustainability also depends on containing socio-economic disparities between territories, particularly in the larger EU context. Cohesion across territories is a fundamental objective of the EU (Article 3.3 TEU). Containing geographical disparities depends on the ability of national and subnational territories to converge upward and to guarantee equal access to services in different areas. The profile of inequalities described in Chapter 1 and outlined above is different at EU, Member State and subnational level. Regional heterogeneity is often masked at Member State level (see *Figure 2.3* and *Figure 2.4*). Notably,

([134]) OECD (2014), "Focus on Inequality and Growth - December 2014".

([135]) European Commission (2018b): ESDE (2018), Chapter 3.

([136]) See Klasen and Lamanna (2008); Dabla-Norris et. al. (2015); Hirschman (1973), pp. 29-36.

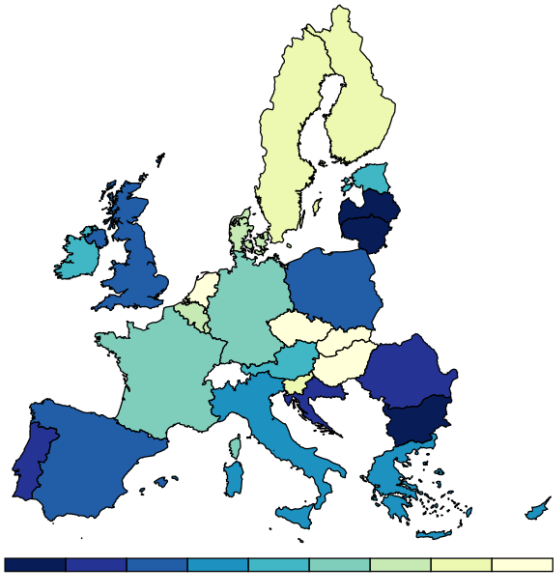
([137]) See Ostry et al. (2014); Easterly (2007), pp. 755-776; Thorbecke and Charumilind (2002), pp. 1477-1495.

where labour market indicators are concerned, disparities are usually larger between EU regions than between EU Member States. Furthermore, in some cases, the convergence patterns of regions differ from those of Member States. For example, over 2004–2016 Member States' employment rates converged while divergence was recorded at regional level. ([138]) Moreover, income inequality in the EU population has increased considerably over the 2011-2016 period, with still large differences between Member States, ([139]) reflecting the impact of the economic crisis. The variation among euro zone Member States has increased and regional disparities have expanded since the onset of the crisis. ([140])

Figure 2.3

Income inequality at national level....

S80/S20 income quintile share ratio at Member State level (NUTS 0), 2016



Note: Inequality is measured here by the S80/S20 income quintile share ratio, which refers to the ratio of total equivalised disposable income received by the 20% of the country's population with the highest equivalised disposable income (top quintile) to that received by the 20% of the country's population with the lowest equivalised disposable income (lowest quintile). The darker colours on the map denote higher values and therefore higher inequality. NUTS refers to the EU nomenclature of territorial units for statistics. NUTS 0 denotes the Member State level. The current NUTS 2016 classification, which entered into force on 01/01/2018, lists 104 regions at NUTS 1, 281 regions at NUTS 2 and 1348 regions at NUTS 3 level.

Source: Map by Commission services, based on Eurostat data.

Click here to download figure.

Social protection systems have the potential to raise economic efficiency and contribute to economic growth in the face of market failures. The efficient market-based provision of insurance against ill health or unemployment and for old age is often subverted by imperfections in the corresponding markets. State intervention ensuring the provision of such insurance has a clear economic benefit: it allows individuals to smooth out consumption over the life cycle (old-age pension) and face important risks (sickness, unemployment).

([138]) Mascherini and Istituto per la Ricersa Sociale (2018), p. 5.

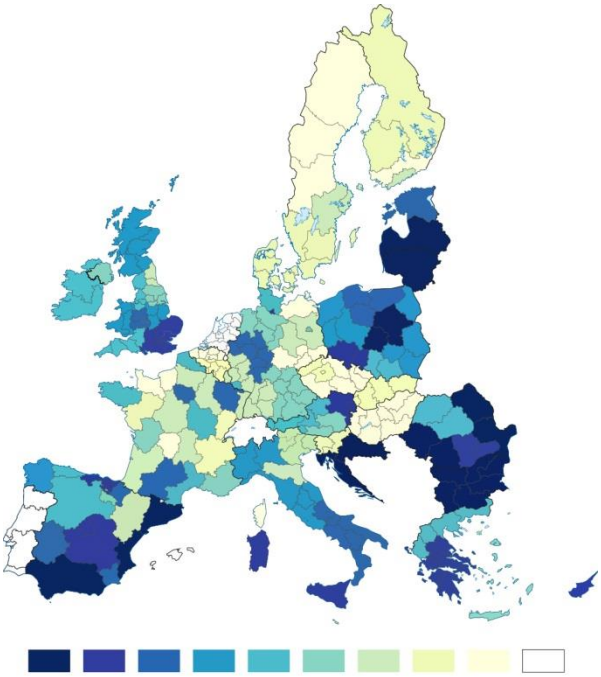
([139]) Mascherini and Bisello (2018), p.12. Eurostat data on the Gini coefficient confirms that inequality has significantly increased in a number of Member States such as Bulgaria, Denmark, Spain, Lithuania, Hungary and Austria.

([140]) Ibidem.

Figure 2.4

... does not capture the significant socio-economic disparities within Member States

S80/S20 income quintile share ratio at NUTS 2 level, 2016



Note: Inequality is measured here by the S80/S20 income quintile share ratio. The darker colours on the map denote higher values and therefore higher inequality. NUTS refers to the EU nomenclature of territorial units for statistics. NUTS 2, shown here, is the primary regional level in which Cohesion Policy intervenes.

Source: Map by Commission services, based on Eurostat data.

Click here to download figure.

Such policies may further underpin economic performance to the extent that, in the absence of insurance, people are likely to be more risk-averse in their choice of activities. When protected by the benefit system, people engage in risky and profitable economic activities, which they would probably not undertake otherwise. Social insurance may thus contribute to aggregate economic performance by facilitating better matching between labour demand and supply (e.g. unemployment insurance facilitating a search for jobs that match one's skills better) or encouraging innovation and entrepreneurship, which in turn can raise productivity and growth.

In addition, public social insurance schemes play a major role in macroeconomic stabilisation. They dampen fluctuations in real GDP and thereby in unemployment by acting as automatic stabilisers. These help to limit the loss of economic efficiency resulting from volatility in the economy, contributing to enhanced economic performance - to the extent that large output fluctuations can, notably in the absence of wage flexibility, result in a trend increase in unemployment (hysteresis effects) and erode human capital thereby undermining existing living standards.

The effectiveness of social transfers (excluding pensions) in poverty reduction has been different across Member States. The EU's limited success in poverty reduction under EU2020 and

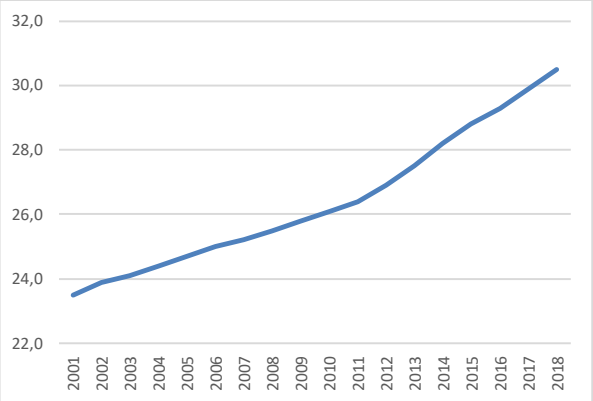
persisting inequalities call for enhancing access to and coverage by social protection systems, while improving the adequacy of benefits. Beyond becoming more inclusive, modernised social protection also entails combining minimum income support schemes with stronger incentives to participate in the labour market.

In the future, demographic change may impose further challenges to social sustainability. Advances in the medical sciences and a higher quality of life have enabled Europeans to live longer. In line with a universal process of rising living standards and a transition from pre-modern to post-industrial demographic patterns, ([141]) average life expectancy at birth in the EU has risen to roughly 81 years. As a result, the EU's old age dependency ratio has increased uninterruptedly in the last two decades (see *Chart 2.6*). Demographic change is also affected by migration. Although migration influences the size of working-age population, it may not necessarily lower the ratio between people *not* in employment and the employed population (Economic Dependency Rate). ([142]) A lot will depend on how well migrants get integrated into the labour market and whether they settle for the long-term (in which case they would add to the dependent part of the population after their working lives).

Chart 2.6

The EU's old-age dependency ratio has been rising rather fast

Old age dependency ratio (population aged 65 and over to population aged15-64, EU-28)



Source: Eurostat [demo-pjanind]

Click here to download chart.

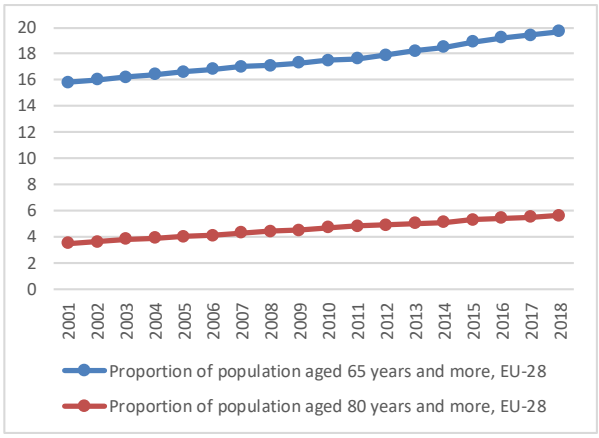
Demographic ageing puts pressure on social security systems. An increasing proportion of people in retirement age (65+) raises concern due to their dependence on a smaller labour force. Between today and 2060, the number of people aged over 65 is expected to increase from 30.5 to 51.6 per 100 people of working age (15-64). Moreover, between 2001 and 2018 the proportion of people aged 80 and over increased by almost 60% (see *Chart 2.7*). These developments have a profound impact on the sustainability and adequacy of pension systems as well as on accessible provision of quality long-term care and health care. All this puts particular pressure on the cohorts of young Europeans, who will, compared with their parents, have to pay higher contribution rates and will receive lower pensions in retirement. Indeed, earlier Commission analyses have identified this 'double burden' for today's young and for future generations. Ageing, together with frequent breaks in their careers or part-time work, contributes to that situation. In addition, the uncertainty of the legal framework and social protection regarding new types of work further accentuates this concern. ([143])

However, longer working lives can alleviate this pressure. The concerns above do not factor in the many years of healthy and potentially active lives that Europeans live today. Reaching the age of 65 does not have to be the end of a person's productive life, so there is a margin for extending the labour force participation of older workers. Flexible retirement ages and working arrangements as well as adjusted infrastructure and equipment can help to alleviate the economic challenges arising from changes in the traditionally defined working-age population and the increasing ratio of workers to non-workers (dependency ratio). Annex 3 demonstrates that longer working lives would significantly lower the burden on the working population. Finally, a similar and very effective remedy to the negative repercussions of population ageing is increasing the labour force participation of women to levels closer or equal to those of men.

Chart 2.7

The shares of Europeans in inactive age is increasing rapidly, putting pressure on the labour force and social protection systems

Proportions of population aged 65 or over and 80 or over, EU-28



Source: DG EMPL calculations based on Eurostat data [demo_pjanind].

Click here to download chart.

Demography and Mobility

Despite its important benefits, intra-EU labour mobility can magnify the effects of population

([141]) See Rosling (2018), Chapter 2.

([142]) See the findings of the study co-authored by the European Commission's Joint Research Centre on Demographic Scenarios for the EU in Lutz (2019), pp. 36-43. ESDE 2015 had also shown that the number of migrants necessary to maintain today's economic dependency rate in the future would have to climb to unrealistic magnitudes (p. 165).

([143]) See ESDE 2018, Chapters 2, 4, 5.

ageing in some cases. One of the four fundamental freedoms of the EU single market, the free movement of people between Member States has also contributed to population changes in the EU. By enhancing the allocation of productive factors, free movement of labour has beneficial effects on the economies of sending and receiving countries and of the EU as a whole. Short-term benefits of sending countries include the absorption, through mobility, of labour demand shocks, when these cause unemployment, and thereby a reduction of the burden on public finances and insurance systems due to lower expenditure on unemployment benefits and social assistance. On the other hand, labour flows into the receiving Member States may compensate for shortfalls in their labour supplies.

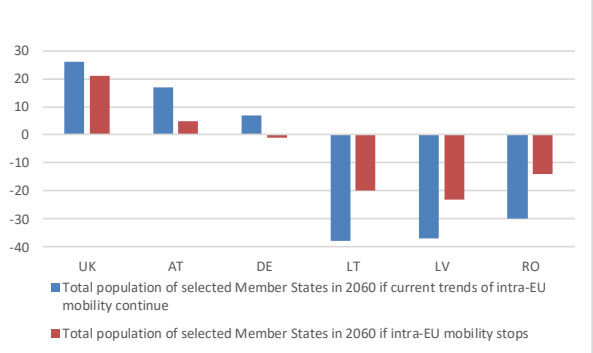
Even when certain patterns of intra-EU mobility are disruptive, they are reversible. Over the last two decades, differences in wages and living standards between Member States encouraged many citizens to seek employment outside their countries of origin. The main flows are from East to West and from South to North, influencing the size of both the total population and the labour force of sending and receiving Member States but having a disproportionate effect on the former, due to their usually smaller size. A pattern of high emigration of educated citizens ('brain drain') and other skilled labour can mean a smaller and lower-skilled workforce in sending countries. In the medium- to long-term, this can lower productivity and innovation potential and accelerate depopulation and population ageing, as emigrants are often early-career adults (see *Chart 2.8*). As a result, sending countries may experience skill shortages, erosion of their tax bases, lower overall return from their earlier investments in the welfare and education of their citizens and difficulty to maintain infrastructure and services. In turn, this may increase socio-economic disparities between Member States and their regions, counteracting the objectives of certain EU policies, notably of cohesion policy. ([144]) However, the recently increasing returns of skilled labour to EU sending countries show that these trends are not predictable with certainty. Changing macroeconomic and labour market positions and incentivizing policies (e.g. competitive employment opportunities for the highly skilled) can safeguard sending countries from excessive loss of talent (see Box 4.2 in Chapter 4 for a detailed discussion of 'brain drain' in the EU).

([144]) See Lutz (2019), pp. 44-50.

Chart 2.8

Under certain conditions, intra-EU mobility could affect the population size of Member States

Change in total population of selected Member States based on the assumption of a continuation of mobility trends without substantial increase in returns, or, alternatively, on the hypothetical scenario of a full stop to mobility



Source: Authors' chart based on calculations in the publication 'Demographic Scenarios for the EU: Migration, Population and Education' (2019).

Click here to download chart.

4.2. The Social-Environmental Nexus

The EU has been at the forefront of decoupling economic activity from its negative effects on the environment. This decoupling has to be achieved through resource and energy efficiency increases, sustainable consumption and production. The transition to a low-carbon, low-waste, low-polluting economy requires the transformation of production methods and consumption patterns in a manner that addresses the three dimensions of sustainable development simultaneously: boosting competitiveness to promote economic growth, create new jobs and promote equity and inclusiveness while ensuring that this growth does not have a negative impact on the environment. Inter alia, this requires "closing the loop" in the life cycles of products and materials, i.e. from production and consumption to waste management and then to markets for secondary raw materials, as recognised in the 2015 European Commission's action plan "Towards a circular economy". The 2030 climate and energy framework, addressing energy efficiency, renewable energy, revised Emissions Trading Scheme and emission standards was adopted to achieve EU-wide targets and policy objectives under the 'Paris agreement'. The framework is a key driver of the transition to a low-carbon economy and builds an energy system, which ensures that there is a secure supply of and affordable energy for all, creates new opportunities for growth and jobs and brings environmental and health benefits through reduced air pollution. ([145])

Greater efforts are required at the EU and global level. The urgency of the transition to a low-carbon economy raises the question of potential trade-offs. The recently-published climate change report by the Intergovernmental Panel on Climate Change (IPCC)([146])

([145]) https://ec.europa.eu/clima/policies/strategies/2030_en

([146]) IPCC (2018), Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global

urges further decisive action on climate change (one of the 'planetary boundaries') to limit the rise in global warming since pre-industrial times to 1.5 degrees. Beyond this limit, the risks of droughts, floods, extreme heat and poverty worsen significantly. Additional efforts imply additional costs as well as opportunities for the economy and society. This begs the question of whether economic expansion and environmental sustainability can reinforce each other or if the one can only be achieved to the detriment of the other. The cost of the transition to a low-carbon economy in terms of employment, skills and the ability to meet basic needs also has to be explored, as do the distributional effects of bearing this cost. Who would be the losers from this and what compensation and adjustment mechanisms can be put in place to enable a fairer sharing of the costs of transition?

Climate change action and the related energy transition are expected to have limited, typically positive total employment effects, but composition effects are also important. Several recent studies and model projections (impact assessment on long-term GHG reduction strategy 2018, impacts of circular economy policies on the labour market 2018, *Employment in Europe* report 2009) have shown that climate change action to meet the Paris agreement targets should have a limited impact on GDP growth (between -1.3% and +2.2%) and aggregate employment in the EU (+0.3% to +0.9%). However, the transition to low carbon society is bound to produce winners and losers across various economic sectors and regions, at least in the short to medium term. The composition of employment across some sectors is likely to be affected significantly. Job increases are projected primarily in the renewable energy and energy efficiency sectors, including construction and eco-system services (e.g. agriculture). Jobs are most likely to disappear in mining and extraction, while the results for services and manufacturing are more ambiguous. EU regions that rely predominantly on sectors expected to experience job losses and those where industry will have to adapt the most, are likely to see more significant challenges from the transition. It will therefore be important to design compensation and adaptation measures in order to support these regions in transition. As the economy restructures, so will skill requirements of existing jobs. The current workforce in the declining sectors is not a perfect substitute for the human capital needs in the expanding sectors and, therefore, reskilling will be necessary. However, the transition to a low-carbon economy is expected to require more of the existing skills sets, with the emphasis on transversal skills in design, monitoring, and communications rather than the development of a completely new set of skills, as, for example, in the case of digitalisation. ([147])

In the transition to a low carbon economy, energy prices are expected to increase in the medium term, having a potentially detrimental effect on energy poverty.([148]) Energy-poor households experience inadequate levels of essential energy services - warmth, cooling and lighting - which guarantee a decent quality of life including health. This does not necessarily affect only those at the bottom of the income distribution and it requires measures in addition to those for fighting poverty. Energy poverty is driven by a combination of factors including high energy prices, low incomes and inefficient buildings and appliances. In 2015, the poorest households spent around 10% of their total consumption expenditure on energy products including electricity, gas, liquid and solid fuels and central heating. Differences across Member States are significant, ranging from 3% in Sweden to 23% in Slovakia. ([149]) Up to 2030, energy expenses are expected to increase significantly in absolute terms, but in relative terms they will increase less than they did between 2000-2015. After the 2030 peak a decline is expected under different modelling scenarios, as the benefits of the energy transition materialise fully. Subsidies to poor households are often badly designed, subsidising the cost of energy instead of compensating poor households for lost income and / or enabling them to invest in energy efficiency and thus lowering future consumption costs. These subsidies do little to encourage energy saving and switching to non-fossil fuels. In addition, poor households face greater constraints in frontloading investment in energy efficiency and renewable energy.

There is no standardised or commonly accepted way of assessing vulnerability to environmental health hazards. ([150]) However, recent studies show that the detrimental impact of degrading environmental components is already visible today. For example, the recent Court of Auditors report finds that air pollution is the biggest environmental risk to health in Europe ([151]). It causes about 400,000 premature deaths in the EU and results in hundreds of billions of euro in health-related external costs. This has a direct effect on the quality of life, on productivity in terms of lost days at work and on public budgets.

Environmental health hazards tend to affect more negatively groups of lower socio-economic standing. However, evidence about the level of exposure of different groups is mixed. Regions that are both relatively poorer and more polluted in terms of particulate matter (PM) are located mainly in eastern

greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty,, https://www.ipcc.ch/sr15/

([147]) CEDEFOP (2012); Cambridge Econometrics et al. (2018).

([148]) Methodological issues related to the concept of energy poverty call for a cautious interpretation of these estimates.

([149]) EU energy poverty observatory, https://www.energypoverty.eu

([150]) European Environmental Agency (2018). p. 77.

([151]) For the link between climate change and air pollution see Chapter 5.

and south-eastern Europe. There is also a link between socio-economic status and exposure to PM at a finer-scale, local level. Wealthier sub-national regions tend to have higher average levels of nitrogen dioxide (NO2), mostly because of the concentration of traffic and industrial activities in these locations. However, poorer communities also tend to be exposed to higher local levels of NO2, as shown by studies with finer spatial granularity. In many cities, poorer communities are exposed to higher temperatures because of the urban heat island effect. ([152]) These temperatures are projected to continue to increase gradually due to climate change. However, a relatively high proportion of the individuals reporting pollution and other environmental problems in the EU belong to the national middle classes (see Chapter 5).

5. Conclusions

Sustainable development in its economic, social and environmental dimensions is a fundamental EU objective. All three dimensions of sustainable development, including the social, are high on the list of European citizens' preoccupations.

The social dimension figures prominently among EU priorities as set out in the Treaties and policies. It covers areas such as the promotion of employment, good working conditions, improvement of living standards, the fight against social exclusion and discrimination, social justice, human capital development, gender equality and social dialogue. The EU ranks very high in international comparisons in terms of social progress, as confirmed by a number of international indices developed to monitor progress towards the Sustainable Development Goals. Nonetheless, challenges resulting from ageing, digitalisation and globalisation risk undermining the sustainability of these achievements.

Social sustainability in its temporal aspect is difficult to measure. Different approaches have been proposed in the past. The Social Scoreboard can be considered as a tool for measuring progress in the social dimension of sustainability. Its overall methodology implicitly measures existing stocks and monitors flows under 14 headline indicators.

Identifying synergies among different dimensions of social sustainability as well as between social, economic and environmental dimensions is crucial. Useful as these approaches are, dashboard-type metrics do not necessarily identify synergies between the constituent aspects of the social dimension or between the social and other dimensions of sustainability. More information on these synergies could provide pivotal guidance to policymakers on promoting various objectives across all dimensions of sustainability in a balanced manner. This chapter has undertaken a factor analysis that reveals four principal components (factors) linking the different dimensions of sustainability.

The first factor – policies focusing on human capital (skills and social welfare) - most resembles a virtuous circle of sustainable development. This factor also shows how effective institutions and high energy productivity create social trust and favour economic efficiency. By contrast, the second factor illustrates conditions and weaknesses that undermine sustainable development - unaddressed structural problems, which accumulate over time and lead to internal devaluation. Another factor suggests that targeted welfare spending can be effective in lowering poverty rates and inequality.

The factor analysis identifies clusters of Member States according to their (social) sustainability characteristics. The cluster analysis presents some initial evidence of structural labour market inefficiencies in certain Member States in the South of Europe. Such inefficiencies are indicated by high unemployment, poor labour market performance of vulnerable groups and low bargaining power of employees. ([153]) Most north-western Member States seem to have solid sustainability foundations: a skilled workforce coincides with higher productivity, reinforced by effective and trustworthy institutions. These countries also invest more in social welfare and display higher efficiency in the use of natural resources. Eastern Member States are still catching up with founding Member States in terms of GDP per capita and labour productivity. Their tradition of social dialogue is less developed and people have a lower level of trust in institutions. Finally, a number of these countries lag behind in terms of skills and environmental policy implementation. The Baltic States together with Romania and Bulgaria have high poverty and inequality and low potential for social transfers to ameliorate these social outcomes.

Policy action needs to exploit synergies between the social and other dimensions of sustainable development. Employment and social policies need to support social sustainability in a world that is being reshaped by demographic change, automation/ digitalisation and climate change. Social policies have to be accompanied by a broader policy mix to ensure that no one is left behind in the upcoming transitions. To secure social acceptance of the necessary reforms, a generalized upstream integration of the social dimension in all future policies is essential.

([152]) European Environmental Agency (2018).

([153]) For a more detailed analysis of labour-market inefficiency and its drivers see section 3.3 of Chapter 3.

Annex 1: The Social Scoreboard

The Social Scoreboard is a central tool for monitoring performance in the employment and social domains, and convergence towards better living and working conditions. It helps to monitor the situation of Member States on measurable dimensions of the Pillar, complementing the existing monitoring tools, e.g. the Employment Performance Monitor and the Social Protection Performance Monitor. The Scoreboard's 14 headline indicators assess employment and social trends in:

- Equal opportunities and access to the labour market
- Share of early leavers from education and training, age 18-24
- Gender gap in employment rate, age 20-64
- Income inequality measured as quintile share ratio - S80/S20
- At-risk-of-poverty or social exclusion rate (AROPE)
- Young people neither in employment nor in education or training (NEET rate), age 15-24
- Dynamic labour markets and fair working conditions:
- Employment rate, age 20-64
- Unemployment rate, age 15-74
- Long-term unemployment rate, age 15-74
- Gross disposable income of households in real terms, per capita
- Net earnings of a full-time single worker without children earning an average wage
- Public support / Social protection and inclusion
- Impact of social transfers (other than pensions) on poverty reduction
- Children aged under 3 in formal childcare
- Self-reported unmet need for medical care
- Share of population whose overall digital skills are basic or above.

The methodology for analysing headline indicators has been agreed by the Employment Committee and the Social Protection Committee. The 2019 exercise of the Scoreboard shows that Europe is making progress in labour market and social situations. In a context of improving labour markets and declining poverty, all 14 headline indicators recorded an improvement, on average, over the previous available year (2017 or 2016). The most significant progress was recorded in (overall and long-term) unemployment rates, which decreased in all Member States in 2017, with only one "critical situation" highlighted. Although labour markets have improved considerably across the Member States, the fact that most problematic flags appear in the social situation is an additional indication of the fact that the dividends of recovery/growth are unevenly distributed across income quintiles and territories. Similar to the 2018 Joint Employment Report, problematic flags appear more frequently in the area of 'public support/social protection and inclusion', with an average of 9.8 cases (of which 3.5 are 'critical situations') per indicator. 'Children aged under 3 in formal childcare' appears as the indicator with most flags, i.e. for 12 Member States (of which 4 are in the bottom category).

The Social Scoreboard measures progress in key dimensions of the Social Pillar, using mostly existing and well-established indicators. The methodology allows measurement of convergence by analysis of both the levels of and changes in the indicators. The presentation of results using a colour code is relatively straightforward. However, the Scoreboard does not cover all Social Pillar principles. It also does not allow capturing *upward* convergence, as the benchmark is the change regardless of the direction.

Annex 2: Variables in the factor analysis

A2.1.1. Additional variables complementing the Factor Analysis

Table 2.2 of this chapter presented the results of a Factor Analysis, which included 45 different variables from seven thematic blocks that are relevant to sustainable development.

Those 45 original variables were reduced to just four principal components of sustainable development. Given that the original variables are correlated, it was possible to radically reduce their numbers while keeping 73% of the information about cross-country differences captured in the original variables.

However, the number of indicators that were funneled into the analysis as input information was much higher than 45 - several hundred variables from very different sources were tested. Most were eliminated because they did not sufficiently contribute to explaining one of the factors (no correlation). Others were not sufficiently related in terms of the content of one of the seven thematic blocks. In addition, a number of variables were excluded from the final Factor Analysis because they were so highly correlated to other variables that they would not yield any additional information.

A number of variables not included may well have added value. However, inserting too many variables in the extraction of only four factors would render the factors unstable and complicate their interpretation. The following table gives a selection of variables for which this is the case, presenting their correlation with the four factors (if the value of their loading is equal to at least 0.5). They confirm the interpretation of the factors provided in the chapter.

The following sections explain variables whose definition may not be self-explanatory or commonly known.

A2.1.2. Explaining the variables used in the Factor Analysis

NEET rate for population aged 15-24 – total

Young people neither in employment nor in education or training

Source: Eurostat

Job satisfaction

Measurement based on a question from the Quality of Life Survey 2016: "Could you please tell me on a scale of 1 to 10 how satisfied you are with the job, where 1 means you are very dissatisfied and 10 means you are very satisfied?"

Source: Eurofound

Lifelong learning (percentage of adult population participating in education and training)

Information from the EU Labour Force Survey 2017: Participation in formal and non-formal education and training in the last four weeks before the survey.

Source: Eurostat

Chart A2.1

Additional variables confirm the four principal components of sustainable development

Variables not included in the Factor Analysis of Table 2.2: correlation with the four factors (suppressed if < 0.5)

	Investment and effective institutions favour productivity	Degree of labour market (in-)efficiency	Effective welfare states favour good social outcomes	Limits to growth, costly labour, high social expenditure	Source
Overall employment growth: total growth over 3 most recent periods - total				-0.59	1
Change in share of part-time employment in overall employment (over last 3 years)				0.57	1
People at-risk-of poverty or social exclusion - total			-0.79		2
Impact of social transfers (other than pensions) in reducing poverty			0.72		2
Relative median poverty risk gap			-0.73		2
Persistent at-risk-of-poverty rate			-0.81		2
At-risk-of poverty rate of children (aged 0-17)			-0.87		2
Relative median poverty risk gap (18-64)			-0.73		2
Housing deprivation (65+)			-0.51		2
Youth unemployment rate, for population aged 15-24 - total		0.82			1
Job tenure in years (15-64)		0.80			1
Rate of long-term unemployment (as % active population) - total		0.80			1
Share of employees working in involuntary fixed-term or part-time contracts - men		0.73			1
Share of employees working in involuntary fixed-term or part-time contracts -women		0.75			1
Median relative income ratio of elderly people (65+)		0.55			2
Self-perceived health (very good + good)	0.60				2
Child care – Children cared for (by formal arrangements other than by the family) (age 0 to 3)	0.79				2
Gender gap in part-time employment	0.80				1
Completion of tertiary or equivalent education (aged 30-34) - men	0.56				1
Eco-Innovation Index	0.77				3

Data sources:
1 Eurostat EU Labour Force Survey (2017)
2 Eurostat EU Survey of Income and Living Conditions (2017)
3 Eco-Innovation Index published by Eurostat

Note: Data sources: 1: Eurostat EU Labour Force Survey (2017); 2: Eurostat EU Survey of Income and Living Conditions (2017); 3: Eco-Innovation Index published by Eurostat
Source: Commission Services
Click here to download chart.

Poverty threshold (60% of median income)

60 % of the national median equivalised disposable income after social transfers. Information from the EU Survey of Income and Living Conditions.

Source: Eurostat

At-risk-of poverty rate

The share of people with an equivalised disposable income (after social transfers) below the at-risk-of-poverty threshold. Information from the EU Survey of Income and Living Conditions.

Source: Eurostat

Impact of social transfers (incl. pensions) in reducing poverty

The reduction in percentage of the risk of poverty rate, due to social transfers: compares the at-risk-of poverty rates before and after social transfers (transfers without pensions).

Source: Eurostat

Severe material deprivation rate

A measure of living conditions severely constrained by a lack of resources, in which people experience at least 4 out of the following 9 deprivations: they cannot afford i) to pay rent or utility bills, ii) to keep their home warm enough, iii) to face unexpected expenses, iv) to eat meat, fish or a protein equivalent every second day, v) a week's holiday away from home, vi) a car, vii) a washing machine, viii) a colour TV or ix) a telephone.

Source: Eurostat

In-work poverty

The proportion of employed persons at risk of poverty. Information from the EU Survey of Income and Living Conditions.

Source: Eurostat

S80/S20

Ratio between the highest and the lowest income quintile, i.e., the 80th percentile divided by the 20th percentile of the income distribution.

Source: Eurostat

Social protection expenditure in % of GDP

Under the European system of integrated social protection statistics (ESSPROSS), the expenditure of social protection is classified by type and function, old-age being one of these functions.

Source: Eurostat

Tax wedge, earnings 100%, single

An OECD measure defined as the ratio between the amount of taxes paid by an average single worker (a single person at 100% of average earnings) without children and the corresponding total labour cost for the employer.'

Source: OECD

Trade union density

A measure that OECD defines as 'union membership as a proportion of wage and salary earners'.

Source: OECD

Bargaining coverage rate

The 'proportion of all wage earners with right to bargaining' defined in the Database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (ICTWSS), maintained by the University of Amsterdam.

Source: ICTWSS

Collective Bargaining at Sectoral or Regional level

In the questionnaire of the 2013 European Company Survey distributed to managers one question was: "Are employees in this establishment covered by any of the following collective wage agreements?" One of the answer options is: "A collective agreement negotiated at sectoral or regional level" (as opposed to national, or individual - i.e.company - level).

Source: Eurofound

Voice and Accountability

According to the Worldwide Governance Indicators project (WGI) this indicator "reflects perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media."

Source: WGI (World Bank)

Government Effectiveness

According to the Worldwide Governance Indicators project (WGI), this indicator "reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies."

Source: WGI (World Bank)

Rule of Law

According to the Worldwide Governance Indicators project (WGI), this indicator "reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence."

Source: WGI (World Bank)

Control of Corruption Index

According to the Worldwide Governance Indicators project (WGI), this indicator "reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests."

Source: WGI (World Bank)

Energy productivity

The indicator measures the amount of economic output that is produced per unit of available energy. Further Information: Eurostat. The variable is part of the set of indicators supporting the Sustainable Development Goals in an EU context.

Source: Eurostat

Resource productivity and domestic material consumption

Gross domestic product divided by domestic material consumption (DMC). DMC measures the total amount of materials directly used by an economy. For further information see Eurostat. The variable is part of the set of indicators supporting the Sustainable Development Goals in an EU context.

Source: Eurostat

A2.1.3. Additional variables

People at-risk-of poverty or social exclusion

People at risk of poverty (threshold: 60% of the national median equivalised income) *or* severely materially deprived *or* living in households with very low work intensity. People living in households with very low work intensity are those aged 0-59 living in households where the adults (aged 18-59) work 20% or less of their total work potential during the past year.

Source: Eurostat

Relative median poverty risk gap

Gap between the median income of those living below the poverty threshold and the poverty threshold itself (as percent of the poverty threshold).

Source: Eurostat

Persistent at-risk-of-poverty rate

People at risk of poverty for the current and at least two out of the preceding three years.

Source: Eurostat

Median relative income ratio of elderly people (65+)

The ratio of the median equivalised disposable income of people aged above 65 to the median equivalised disposable income of those aged below 65.

Source: Eurostat

Housing deprivation (65+)

Percentage of the population deprived of certain housing items. For more information see Eurostat.

Source: Eurostat

Self-perceived health (very good + good)

Indicator expresses subjective assessment by the respondent of his/her health. It is based on one question from the EU statistics on income and living conditions (EU-SILC): "How is your health in general?" (four answer options).

Source: Eurostat

Gender gap in part-time employment

Difference between the share of part-time employment in total employment of women and men aged 20-64. The indicator is based on the EU Labour Force Survey.

Source: Eurostat

Eco-Innovation Index

A composite indicator is calculated from 16 sub-indices, which measure ecological efficiency and innovation. For more information see EU Open Data Portal.

Source: Eurostat.

Annex 3: Longer working lives help sustain pension systems

In the 2017 *Employment and Social Developments in Europe* annual review a simple illustration was presented to demonstrate how demographic ageing in the EU may impact future pension levels and contribution rates to the EU's pension schemes. ([154]) This model can be extended to show how longer working lives can help sustain current pension systems.

The model starts from the extreme assumption that the EU had one single pension scheme, with one single contribution rate paid by workers and one average level of pensions, relative to average wages. Everyone of working age (20 to 65 years) is assumed to be in employment, everyone older than 65 is on a pension. The pension level is assumed to be 47% of the average wage, which corresponds to today's average level of pensions. Under these assumptions, workers will have to pay a contribution rate equal to 14% of wages in order to finance these pensions in a pure Pay-As-You-Go pension system.

Under these simple assumptions, the only determinant of the pension level and the contribution rate is demographic change. ([155]) Working-age population is projected to decline whereas the number of older people will increase. As a result, there will be more than 0.5 older people per person of working age in 2060, up from 0.3 today. Considering the strong increase in demographic dependency, it is assumed that some kind of pension reform will be implemented today (in the base-year 2017). This reform will lower the level of pensions with the aim of limiting the expected necessary increase of the pension contribution rate to a maximum of 20% (which otherwise would increase beyond that level). The reforms may be deemed necessary to keep labour costs from increasing too strongly, given that employers will have to pay their share of workers' social security contributions.

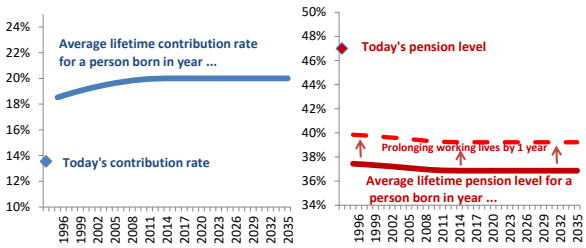
The model looks at cohorts, starting with workers born in 1997 who are assumed to start their working lives aged 20 (in 2017) and then work for 46 years, before receiving a pension for 20 years.

The left chart shows the average contribution rate workers of the different cohorts would have to pay throughout their entire working lives. For workers born today it is already very close to the 20% limit, much higher than what today's workers pay on average (14%).

Chart A3.1

Longer working lives can reduce the double burden on future cohorts significantly.

Average lifetime contribution rate and average pension level by cohort if contribution rates were not to increase beyond 20%, EU-28



Source: Commission calculations based on Eurostat 2015 population projection s

Click here to download chart.

The right chart shows the level of pensions (in percent of wages) which the respective cohorts will receive when retired. The same cohorts that had to pay higher contributions during their working lives will receive a pension equivalent to some 37% of average wages, much lower than today's pension level of 47%. This decline is necessary because we do not allow the increase of the contribution rate beyond 20%, so that higher pensions can no longer be financed.

To demonstrate the impact of longer working lives one could assume that every worker worked for one more year (47 instead of 46), retiring aged 67 instead of 66. As a result, contributions are being paid for one more year. Accordingly, pensions would have to be paid for only 19 instead of 20 years. In that case, an average lifetime contribution rate of 20% would be sufficient to finance a lifetime pension level of 39%, two percentage points higher than without with lower retirement age (see right side of the Chart). The 'double burden' of ageing for future cohorts would be thus alleviated to a significant extent.

([154]) ESDE 2017, Chapter 4, especially Box 4.2 on pp. 122-3.

([155]) ESDE 2018 extends the model by including a labour market scenario (Chapter 5, especially Box 5.5).

References

Agyeman, J., Bullard, R. D., & Evans, B. (2002). "Exploring the nexus: Bringing together sustainability, environmental justice and equity." *Space and Polity*, 6(1), 77–90.

Algan, Y., Guriev S., Papaioannou E, Passari E. (2017). "The European Trust Crisis and the Rise of Populism." *Brookings Papers on Economic Activity*, 2017(2), 309-400.

Alkire, S (2002), "Dimensions of Human Development", *World Development* 30(2): 181–205.

Anderies, J. M., Folke, C., Walker, B., & Ostrom, E. (2013). "Aligning key concepts for global change policy: Robustness, resilience, and sustainability." *Ecology and society*, 18(2): 8.

Apgar, M. J., W. Allen, K. Moore and J. Ataria (2015). "Understanding adaptation and transformation through indigenous practice: The case of the Guna of Panama." *Ecology and Society*, 20(1): 45.

Autor, D. H., D. Dorn, G. H. Hanson and K. Majlesi. (2017). "A note on the effect of rising trade exposure on the 2016 presidential elections." MIT Department of Economics Working Paper, January 2017.

Banerjee, Bobby. (2003). "Who Sustains Whose Development? Sustainable Development and the reinvention of nature." *Organization Studies*, vol. 24, no. 2, pp. 143-180.

Barbier, Jean-Claude, Ralf Rogowski and Fabrice Colomb (eds.) *The Sustainability of the European Social Model*. Edward Elgar Publishing: Northampton, MA, 2015.

Barca, Fabrizio. An Agenda for a reformed Cohesion Policy: A Place-Based approach to meeting European Union challenges and expectations. Independent Report prepared at the Request of Danuta Hübner, Commissioner for Regional Policy. April 2009.

Bardhan, Pranab. "Institutions Matter, But Which Ones?" *Economics of Transition*, vol. 13(3), pp. 499-532.

Bardhan, Pranab (2016). "State and Development: The Need for a Reappraisal of the Current Literature." *Journal of Economic Literature* 2016, 54(3), 862–89.

Barron, Leanne and Erin Gauntlet. (2002). "WACOSS Housing and Sustainable Communities Indicators Project." The Regional Institute Online Publishing, 2002 (4).

Becker, S.O., T. Fetzer and D. Novy (2017). "Who Voted for Brexit? A comprehensive district-level analysis." *Economic Policy*, vol. 32, Issue 92, (October 2017): 601–650.

Begg, I. (2009). "Paving the way for a Strategy of sustainable development," in M.-J. Rodrigues (ed.), *Europe, Globalization and the Lisbon Agenda*. Edward Elgar Publishing: Northampton, MA, 2019.

Begg, I. (2013). "Socio-ecological transition in a period of crisis: how well is the EU coping?" *NEUJOBS Policy Report* No. 1 www.neujobs.eu

Bencur, P., E. Joossens, A.R. Manca, B. Menyhert and S. Zec (forthcoming). "Building a policy-relevant resilience measure: beyond the economic perspective". In Bristow, G. and A. Healy, (eds.), *Handbook of Regional Economic Resilience*. Edward Elgar Publishing.

Benessia, Alice et al. (2012). "Hybridizing sustainability: Towards a new praxis for the present human predicament." *Sustainability Science*, vol. 7 (Supplement 1), pp. 75–89.

Benjamin, Daniel J., Miles S. Kimball, Ori Heffetz and Nichole Szembrot. (2014). "Beyond Happiness and Satisfaction: Toward Well-Being Indices Based on Stated Preference." *American Economic Review* 104(9): 2698–2735.

Benson, M.H. and Craig, R.K.. (2014). "The end of sustainability." *Society and Natural Resources*, vol. 27 (7), pp. 777-782.

Berkes, Fikret. (2007). "Understanding uncertainty and reducing vulnerability: Lessons from resilience thinking." *Natural Hazards*, 41(2), 283–295.

Berkes, Fikret, Johan Colding, and Carl Folke, eds. (2003). *Navigating social-ecological systems: Building resilience for complexity and change*. Cambridge, UK: Cambridge University Press, 2003.

Besley, Timothy & Torsten Person. (2011). *Pillars of Proseprity: The Political Economics of Development Clusters*. Princeton University Press, 2011.

Bockstette, Valerie, Chanda, Areendam. & Putterman, Louis. "States and Markets: The Advantage of an Early Start." *Journal of Economic Growth* (2002) 7: 347-369.

Borcan, O., Olsson, O. and Putterman, L. (2018) "State History and Economic Development: Evidence from Six Millennia." *Journal of Economic Growth* 23(1): 1-40.

Brand, F. S., & Jax, K. (2007). Focusing the meaning(s) of resilience: Resilience as a descriptive concept and a boundary object. *Ecology and Society*, 12(1), 23.

Brown, K. (2014). "Global environmental change I: A social turn for resilience?" *Progress in Human Geography*, 38(1), 107–117.

Bughin, Jacques et al. (2018). *Testing the Resilience of Europe's Inclusive Growth Model*. McKinsey Global Institute Discussion Paper, December 2018.

Cambridge Econometrics, Trinomics, and ICF. (2018). *Impacts of circular economy policies on the labour market; Final Report*. European Commission, Directorate-General for Environment, May 2018.

Campolongo, Francesca, Sven Langedijk, David Mair and Alessandro Rainoldi. (2018) "How to Fix Our Society." Presentation at JRC Meeting with High-Level Peer Group. Ispra, 16 October 2018.

CEDEFOP. (2012). "A strategy for green skills?" *Briefing Note*, February 2012.

Che, Y., Y. Lu, J. R. Pierce, P. K. Schott and Z. Tao. (2016). "Does trade liberalization with China influence US elections?" *National Bureau of Economic Reasearch Working Paper* No w22178.

Chen, Tingyun et al. (2018). Inequality and Poverty Across Generations in the European Union. *IMF Discussion Note*. January 2018.

Clark, W. (2007). "Sustainability science: A room of its own." *Proceedings of the National Academy of Sciences of the United States of America*, 104(6), 1737–1738; p. 1737.

Colantone, I. and P. Stanig (2018). "Global competition and Brexit." *American Political Science Review*, vol 112, issue 2 (May 2018): 201-218.

Costanza, R., & Patten, B. C. (1995). Defining and predicting sustainability. *Ecological Economics*, 15(3), 193–196.

Cote, Muriel, & Nightingale, Andrea J. (2012). "Resilience thinking meets social theory: Situating social change in socio-ecological systems (SES) research." *Progress in Human Geography*, 36(4), 475–489 (p.478).

Dabla-Norris et. al. (2015). *Income Inequality and Labour income share in G20 countries: Trends, impacts and causes*. International Labor Organization, International Monetary Fund, Organisation for Economic Co-Operation and Development, World Bank Group: Prepared for the G20 Labour and Employment Ministers Meeting and Joint Meeting with the G20 Finance Ministers, Ankara, Turkey, 3-4 September 2015.

Darvas, Zsolt and Guntram B. Wolff. (2016). *An Anatomy of Inclusive Growth in Europe*. Brugel Blueprint Series 26, 2016.

Daly, Herman E. (1977). *Steady-State Economics* (2nd ed.). Washington, DC: Island Press.

Daly, Herman E. and J. B. Cobb Jr. (1994). *For the Common Good: Redirecting the Economy toward Community, the Environment, and a Sustainable Future* (2nd ed.). Boston: Beacon Press.

Daly, Herman E. (1996). *Beyond Growth: The Economics of Sustainable Development*. Boston: Beacon Press.

Derissen, S., Quaas, M. F., & Baumgärtner, S. (2011). "The relationship between resilience and sustainability of ecological-economic systems." *Ecological Economics*, 70(6), 1121–1128, p. 1121.

De Vries, C. E. (2018). "The cosmopolitan-parochial divide: changing patterns of party and electoral competition in the Netherlands and beyond." J*ournal of European Public Policy*, 25(11), 1541-1565.

Dijkstra, L., H. Poelman and A. Rodriguez-Pose. (2018). "The Geography of EU Discontent." *Regional and Urban Policy Working Papers* 12/2018.

Duit, A., Galaz, V., & Ebbesson, J. (2010). Governance, complexity, and resilience. *Global Environmental Change*, vol. 20, 363–368.

Dustmann, C, B Eichengreen, S Otten, A Sapir, G Tabellini and G Zoega. (2017). *Europe's trust deficit: Causes and remedies*. Series: Monitoring International Integration 1, CEPR Press, 2017.

Eakin, H., Bojórquez-Tapia, L. A., Janssen, M.A., Georgescu, M., Manuel-Navarrete, D., Vivoni, E. R., et al. (2017). "Urban resilience efforts must consider social and political forces." Proceedings of the National Academy of Sciences of the United States of America, 114, pp. 186–189.

Easterly, William. (2007). "Inequality Does Cause Underdevelopment: Insights from a New Instrument." *Journal of Development Economics*, 84 (2007), 755-776.

Elkington, John (1997). *Cannibals with Forks: The Triple Bottom Line of 21st Century Business*. Capstone, 1997.

Elkington, John. (1999). "Triple bottom line revolution: reporting for the third millennium." *Australian CPA*, vol. 69, 1999.

European Commission. (2009). "Europe 2020: A European strategy for smart, sustainable and inclusive growth. Communication for the Commission." COM(2010)2020 of 3 March 2010.

European Commission. (2016a). "Next steps for a sustainable European future: European action for sustainability. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions." COM(2016)739 final of 22 November 2016.

European Commission. (2016b). "Regional Indicators of socio-economic well-being." *Social Situation Monitor Research Note* no. 9/2016.

European Commission. (2017). Special Eurobarometer 467: Future of Europe; Social issues. November 2017.

European Commission (2017b). Employment and Social Developments in Europe; Annual Review 2017.

European Commission (2018), Employment and Social Developments in Europe; Annual Review 2018.

European Commission (2019a). Commission Staff Working Document – Country Report Luxembourg 2019 Accompanying the document Communication from the Commission to the European Council, the Council, the European Parliament, the European Central Bank and the Eurogroup. February 2019.

European Commission (2019b). Joint Employment Report by the European Commission and the Council accompanying the Communication from the Commission on the Annual Growth Survey 2019. March 2019.

European Commission (2019c). Europe's Sustainability Puzzle: Broadening the Debate. European Political Strategy Centre paper, 8 April 2019.

European Environmental Agency. (2018). *Unequal exposure and unequal impacts: social vulnerability to air pollution, noise and extreme temperatures in Europe*. EEAR Report No. 22, 2018.

European Political Strategy Centre (2019). Delivering on European Common Goods: Strengthening Member States' Capacity to Act in the 21st Century. 3 May 2019.

Eurostat (2018). *Decomposition of the unadjusted gender pay gap using Structure of Earnings Survey data*. Luxembourg: Publications Office, 2018.

Eurostat (2018b). Sustainable development in the European Union — Monitoring report on progress towards the SDGs in an EU context — 2018 edition, Luxembourg: Publications Office of the EU, 2018.

Evans, Peter and James E. Rauch. "Bureaucracy and Growth: A Cross-National Analysis of the Effects of 'Weberian' State Structures on Economic Growth." *American Sociological Review*, Vol. 64, No. 5 (Oct. 1999), pp. 748-765.

Falkenberg, Karl. (2016). Sustainability Now! A European Vision for Sustainability. European Political Strategy Center Strategic Notes, Issue 18 (July 2016).

Filauro, S. and Zachary Parolin. (2018). "Unequal unions? A comparative decomposition of income inequality in the European Union and United States." *Journal of European Social Policy*, November 2018.

Fleurbaey, M (2009), "Beyond GDP: The Quest for a Measure of Social Welfare." *Journal of Economic Literature*, vol. 47(4): 1029–1075.

Fratscher, Marcel. (2018). "Perceptions vs. Reality About Inequality." Presentation at EU Commission Workshop. Brussels, 19 October 2018.

Folke, C. (2006). "Resilience: The Emergence of a Perspective for Socio-Ecological Systems Analyses." Global Environmental Change, 16(3):253-267 (August 2006).

Frey, Bruno S. and Jana Gallus. (2012). "Happiness Policy and Economic Development." *International Journal of Happiness and Development*, vol. 1, no. 1, 2012, pp. 103-111.

Frey, Bruno S. (2018). "Economics and Well-Being." In The SAGE Handbook of Personality and Individual Differences, eds. Virgil Zeigler-Hill and Todd K. Shackleford, vol. 3, pp. 552-567. SAGE: 2018.

Goldman, M. (2006). *Imperial nature: The World Bank and struggles for social justice in the age of globalization*. New Haven, CT: Yale University Press.

Graham, C (2011). *The Pursuit of Happiness: An Economy of Well-Being*. Washington, DC: Brookings Institution Press.

Guiso, L, H. Herrera and M. Morelli. (2018). "Populism: Demand and supply of populism". Einaudi Institute for Economics and Finance (EIEF), Working Paper no. 1703, rev. 2018.

Hassel, Anke. (2018). "Trade Unions and the Future of Democratic Capitalism." In: Pablo Beramendi, Silja Häusermann, Herbert Kitschelt, Hanspeter Kriesi (eds.): *The Politics of Advanced Capitalism*. Cambridge University Press, Forthcoming. Available at SSRN: https://ssrn.com/abstract=2490883

Hemmerijck, Anton. (2018). "Social investment as a policy paradigm." *Journal of European Public Policy*, 25:6, 810-827.

Hicks, Christina C., et al. (2016). "Engage key social concepts for sustainability." *Science*, 352(6281), 38–40.

Hirschman, Albert O. (1973). "The Changing Tolerance for Income Inequality in the Course of Economic Development." *Quarterly Journal of Economics*, vol. 1, No. 12: 29-36 (November 1973).

Iammarino, S., Rodríguez-Pose, A. & Storper, M. (2018). "Regional inequality in Europe: evidence, theory and policy implications." *Journal of Economic Geography*, April 2018. https://doi.org/10.1093/jeg/lby021

Jacobs, Michael. (1999). "Sustainable development: a contested concept." In: A. Dobson, ed., *Fairness and Futurity: essays on environmental sustainability and social justice*. Oxford University Press, 1999, p. 24.

Johnson, Jennifer L., Laura Zanotti, Zhao Ma, David J. Yu, David R. Johnson, Alison Kirkham and Courtney Carothers. (2018). "Interplays of Sustainability,

Resilience, Adaptation and Transformation." In *Handbook of Sustainability and Social Science Research*, ed. by W. Leal Filho, R. W. Marans and J. Callewert. Springer International Publishing, 2018.

Kelley, Judith D. and Beth Ann Simmons. 2015. "Politics by number: Indicators as social pressure in international relations." *American Journal of Political Science,* 59 (1): 55-70.

Klasen, Stephan and Francesca Lamanna. (2008). The Impact of Gender Inequality in Education and Employment on Economic Growth in Developing Countries: Updates and Extension. Discussion Papers, Ibero America Institute for Economic Research 175.

Kraay, Aart. (2018). Methodology for a World Bank Human Capital Index: Background Paper to the 2019 World Development Report. Policy Research Working Paper 8593. World Bank, 2018.

Lutz, W. (ed.), Amran G., Bélanger A., Conte A., Gailey N., Ghio D., Grapsa E., Jensen K., Loichinger E., Marois G., Muttarak R., Potancokova M., Sabourin P., Stonawski M. (2019). *Demographic Scenarios for the EU – Migration, Population and Education*. (European Commission, Joint Research Center) EUR 29739. Luxembourg: Publications Office of the EU, 2019.

Manca, A.R., P. Benczur and E. Giovannini (2017). *Building a scientific narrative towards a more resilient EU society, Part 1: a conceptual framework*. (European Commission: Joint Research Center: JRC science for Policy Report) doi: 10.2760/635528. Luxembourg: Publications Office of the EU, 2017.

Manca, A.R. and S. Zec (2019). "The JRC Narrative on resilience: towards a societal well-being approach." Joint Research Center – Finance and Economy Unit. Presentation given at the European Commission's DG EMPL, 19 June 2019.

Martin, R., Tyler, P., Storper, M., Evenhuis, E. & Glasmeier, A. (2018). Globalization at a critical conjuncture?" *Cambridge Journal of Regions*, Economy and Society, 11(1), 3-16.

Mascherini, Massimiliano, Martina Bisello, Hans Dubois and Franz Eiffe. (2018). *Upward convergence in the EU: Concepts, measurements and indicators*. Eurofound, December 2018.

Mascherini, Massimiliano, Istituto per la Ricersa Sociale and University of Bergamo. (2018). *Monitoring Convergence in the EU: Progress on convergence in employment*. Eurofound, December 2018.

Mascherini, Massimiliano and Martina Bisello. (2018). *Monitoring Convergence in the EU: Progress on convergence in the socioeconomic area*. Eurofound, December 2018.

Meadows, D. H., Meadows, D. L., Randers, J., & Behrens, W. W. (1972). *The limits to growth. A report for the club of Rome's project on the predicament of mankind.* New York, NY: Universal Books.

McKenzie, Stephen (2004). "Social Sustainability: Towards Some Definitions." Hawke Research Institute Working Paper Series No. 27. Magill, South Australia, 2004.

Noll, Heinz-Herbert. (2011). "The Stiglitz-Sen-Fitoussi Report: Old Wine in New Skins? Views from a Social Indicators Perspective." *Social Indicators Research*, vol. 102 (2011), pp. 111-116.

Nussbaum, Martha and Amartya Sen, eds. (1993). *The Quality of Life*. Oxford University Press, 1993.

Nussbaum, Martha. (2001). "Symposium on Amartya Sen's Philosophy: 5 Adaptive Preferences and Women's Options." *Economics and Philosophy*, vol. 17: 67–88.

OECD. (2012). New Approaches to Economic Challenges –A Framework Paper. OECD Week, 2012.

OECD. (2014). Report on the OECD Framework for Inclusive Growth. OECD Publishing, Paris, 2014.

OECD. (2017). How's Life? 2017: Measuring Well-being. OECD Publishing. Paris, 2017.

Olsson, L., Jerneck, A., Thoren, H., Persson, J., & O'Byrne, D. (2015). "Why resilience is unappealing to social science: Theoretical and empirical investigations of the scientific use of resilience." *Science Advances*, 1(4):1-11, e1400217, p. 6.

Ostry, Jonathan D., Andrew Berg, and Charalambos G. Tsangarides (2014). Redistribution, Inequality, and Growth. IMF Staff Discussion Note, IMF, April 2014.

Palier, Bruno. (2018). "The politics and policies of social investment at the EU level: a longitudinal analysis." Presentation at Social Situation Monitor seminar, January 2019.

Pepperdine, Sharon. (2000). "Social Indicators of rural community sustainability: an example from the Woady Yaloak Catchement." The Regional Institute Online Publishing, 2000, available at http://www.regional.org.au/au/countrytowns/strategies/pepperdine.htm

Progressive Society. (2018). Sustainable Equality: Report of the Independent Commission for Sustainable Equality 2019-2024. November 2018.

Ravallion, Martin. "How Long will it Take to Lift One Billion People Out of Poverty?" The World Bank Research Observer, vol 28, no. 2(Aug. 2013).

Rockström, Johan et al. (2009). "Planetary Boundaries: Exploring the Safe Operating Space for Humanity." *Ecology and Society*, vol. 14 (2): 32.

Rodríguez-Pose, Andres. (2018). "The revenge of the places that don't matter (and what to do about it)."

Cambridge Journal of Regions, Economy and Society, 2018, 11: 189-209.

Rodrik, D. (2018). "Populism and the Economics of globalization." *Journal of International Business Policy* (2018).

Rosling, Hans. (2018). *Factfulness: Ten Reasons We're Wrong About the World--and Why Things Are Better Than You Think*. Flatiron Books, 2018.

Smailes, Peter and Hugo Graeme. (2000). "The Gilbert Valley, South Australia." In: Cocklin, C. and M. Alston, M. (eds.). (2003). *Community sustainability in rural Australia: a question of capital?,* pp.65-106.

Sen, Amartya. (2001). *Development as freedom* (2nd ed.). Oxford: Oxford University Press, 2001.

Sen, Amartya. (2010), "Equality of what?" In MacMurrin, Sterling M., ed., *The Tanner lectures on human values*, 4 (2nd ed.). Cambridge: Cambridge University Press, pp. 195–220.

Stiglitz, Joseph E., Amartya Sen and Jean-Paul Fitoussi (2009). Report by the Commission on the Measurement of Economic Performance and Social Progress. 2009.

Thomas, D., Mitchell, T., & Arseneau, C. (2016). "Re-evaluating resilience: From individual vulnerabilities to the strength of cultures and collectivities among indigenous communities." *Resilience*, 4(2), 116–129.

Thorbecke, E. and C. Charumilind. (2002). "Economic inequality and its socioeconomic impact." *World Development*, 30 (9) (2002), pp. 1477-1495.

Vandermotten, C., Capron, H., Decrolly, M. & Romus, P. (1990). Les régions et l'Europe. Actes du Neuvième Congrès des Economistes Belges de langue française. Namur, 1990.

World Bank. (2018). World Development report 2019: The Changing Nature of Work. World Bank, 2018.

World Commission on Environment and Development. (1987). Report of the World Commission on Environment and Development: Our Common Future. UNWCED. Oxford: Oxford University Press, 1987.