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The rise of the paradigm of sustainability and the quest for its measurement in the social domain

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ABSTRACT:

The paper reviews the concept of sustainability (in its economic, social and environmental dimension) in its historical evolution, its rise to prominence in the policy domain and the difficulties linked to its operationalization in the social field. The paper discusses the strengths and weaknesses of existing measurement methods and proposes a new method for monitoring social sustainability in the EU that builds on the European-Semester tool of the Social Scoreboard.

Contents

1. The concept

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. Once an esoteric notion confined to environmental scientists and nature activists, in the last two decades sustainability has gained traction in international policy-making, becoming the dominant paradigm within social-ecological systems and global literature on climate and environmental change.

Sustainability refers to the ability of a system, organism or human-made product to endure indefinitely. The concept emerged 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.'[1] A number of variations of this definition have arisen since then, abbreviating it and accentuating its essential components, as in: 'living well and sharing fairly within the limits of the planet.'[2] Related concepts emphasize the ultimate goods, values and entities that need to be sustained, as in 'sustainable society': 'one where economic growth is compatible with planetary boundaries and fairly distributed among its citizens.'[3] Some break down the ultimate goal of sustainability to its logical prerequisites in the field of human economic activity, such as 'sustainable production,' 'sustainable consumption' 'sustainable agriculture,' 'sustainable fisheries,' etc. Others highlight a single aspect of interest to a group, deliberately shifting the focus away from the original environmental context to social issues and values, as in 'sustainable equality.' [4] As initiatives promoting sustainability and sustainable development remain widespread, different interpretations and applications of sustainability and sustainable development continue to emerge.

From the start, sustainable development and, by extension, sustainability, were considered a normative concept. That is, sustainability is thought of as a good that individuals and institutions ought to strive to foster.[5] From this perspective, sustainability is characterized either as a policy goal or as the process leading to it - a 'normative decision process involved in steering a system to a preferred state.'[6] This dual quality of the concept incentivized its proliferation.

Three dimensions

Sustainable development globally is broadly understood as having three interlinked dimensions - economic, social and environmental. Seminal works that advanced the concept discussed sustainability as a state of balance in the increasingly visible trade-offs between two dimensions - the economy and the environment. Starting in the 1970s, the mounting signs of environmental degradation caused by human activity and the multiplying clues of the finiteness of natural resources inspired the notion of *external limitations* to global economic expansion. Though controversial at the time of its publication, the 1972 'Club of Rome report,' titled *The Limits to Growth*,[7] broke new ground by articulating the existence of ecological limits to both demographic and economic growth. The report was based on a simple, quantifiable rationale: at the time, population, food production, industrialization, pollution and the consumption of non-renewable natural resources (from minerals of strategic importance to stocks of

[1] World Commission on Environment and Development (1987).
[2] European Commission (2016a).
[3] European Commission (2016a).
[4] Progressive Society (2018).
[5] Anderies et al. (2013); Derissen et al. (2011); Hicks et al. (2016).
[6] Berkes et al. (2003); Eakin et al. (2017).
[7] Meadows et al. (1972).

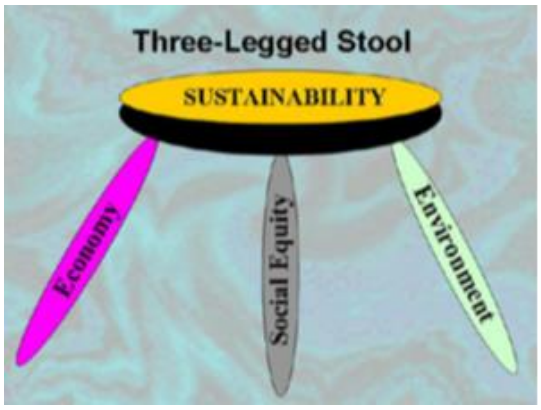
plant and animal life) were increasing exponentially while the ability of human science and technology to substitute plentiful resources for more scarce ones grew only linearly. To sustain humankind in the future by preserving precious resources, the report posited that nothing short of *transformative change* in the interplay between economy and environment was necessary.

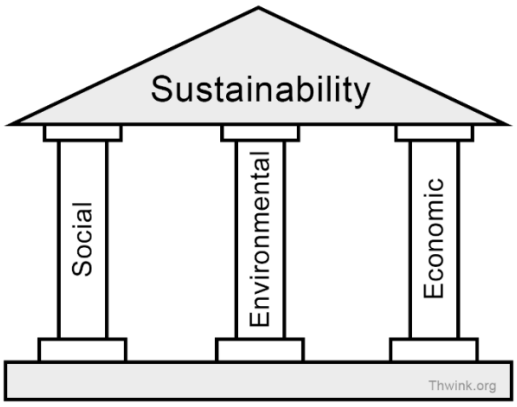
The Brundtland definition of sustainable development focuses primarily on the balance between economy and environment. In the decade that followed his report, the search of development and welfare economics for ways to capture wellbeing beyond the measurement of GDP, focused on the individual economic actor and their social conditions.[8] By the mid-1990s, individual and societal well-being as well as the notion of sustainability had sufficiently permeated and fertilized other fields. So much so, that forward-looking researchers could elevate social concerns to the same level as economic and environmental ones and coin the expression 'triple bottom line.'[9] It epitomized the necessity of *fundamental change* in order to capture and account for all the costs and benefits of human activity in the economic, environmental *and social* dimensions. It was argued that humans had 'to bear in mind 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.' Since then, explicit or implicit reference to the triptych of economic, social and environmental dimensions has been the sine-qua-non assumption of all discourse on sustainability.

However, the relative weight and visibility of the three dimensions of sustainable development has fluctuated in academic research and policy advocacy. Depending on the context, the three dimensions have been considered as objectives of the same order or split in overarching and subordinate ones. In today's policy-making, sustainability's three dimensions are broadly understood as equal and visualized in various ways on a par with each other (see Figure 1. below).

Figure 1. Sustainability and its environmental, economic and social dimensions

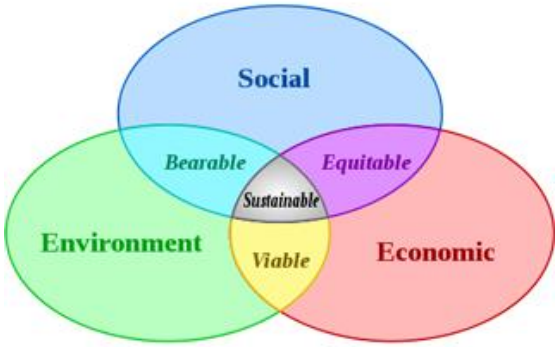
Top: Sustainability as a state supported in equal measure by the pillars of economy, society and environment





Bottom: Sustainability as the intersection between environment, economy and society

[8] See, for instance, Fleurbaey (2009), Benjamin et al. (2014) and Frey (2012) and (2018).
[9] The term is owed to the fresh take of sociologist and business researcher John Elkington on corporate financing. See Elkington (1999) and (1997).

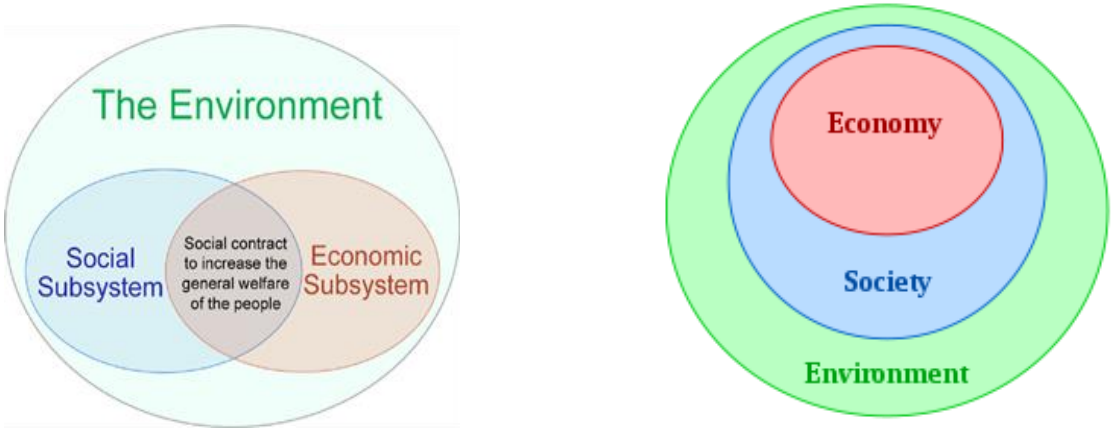


Source: 'Thwink.com: finding and resolving the root causes of the sustainability problem' at http://www.thwink.org/sustain/glossary/ThreePillarsOfSustainability.htm

By contrast, early proponents of sustainable development had considered the environment to be the largest dimension, within which the human-made systems of economy and society are nested.[10] For instance, World Bank Chief Economist and pioneer of ecological sustainability Herman Daly considered environmental sustainability the top priority because the lower the carrying capacity of the environment, the lower the common good delivered by the social system and the less output the economic system can produce (see Figure 2 below).

Figure 2. Society and economy as sub-systems of the environment (biosphere)

The environment contains the social and economic systems formed to increase welfare and economic output



Source: Daly (1996).

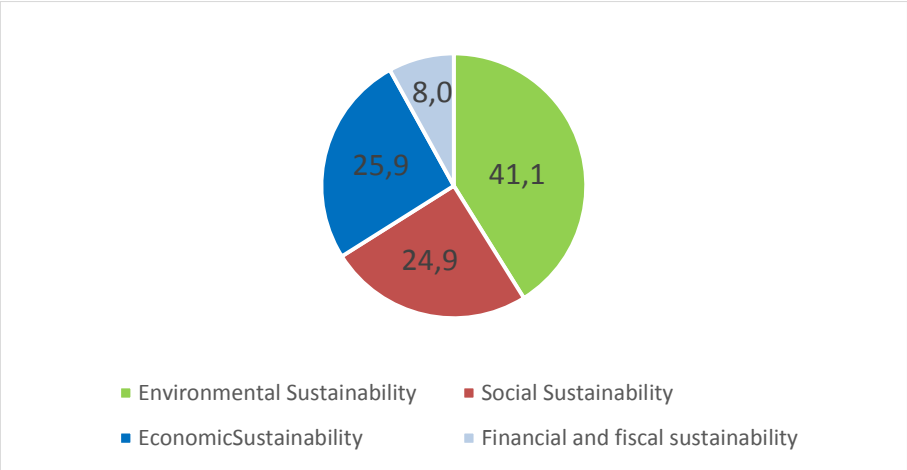
Against the backdrop of the financial and economic crisis in the EU, other sub-dimensions of sustainability gained urgency and visibility. The Great Recession exposed unsustainable trends in the economic development of certain Member States, such as high rates of growth funded through recurring deficits and growing debt – both public and private. In 2010, just as the EU adopted a strategic framework with emphasis on sustainable development ('Europe 2020' discussed later) political priority had to shift to reinforcing 'fiscal sustainability' and 'financial sustainability,' i.e. the robustness of public finances and the viability of the financial system(s), impacted by mounting shares of non-performing loans and extensive holdings of sovereign debt (see Figure 3 below). The social dimension receded into

[10] See Daly (1996).

the background, as saving, strengthening and deepening the Economic and Monetary Union (EMU) became the EU's uncontested top priority for the better part of the 2010s.[11]

Figure 3. The many faces of sustainability

Shares of different (sub-)dimensions of sustainability in publications in the peak year of the euro crisis 2012



Note: Shares of total number of publications (articles, book chapters, books, conference papers, business or press articles, short surveys, or reviews) in the social and economic sciences in the year 2012 featuring one of the three dimensions of sustainability in the title, abstract, or keywords.
Source: Own visualisation based on 2012 data from the ELSEVIER Scopus database, accessed on 21/01/2020.

For all these reasons, the definitions of the three dimensions of sustainability – especially of the social — have received uneven attention. The economic dimension of sustainable development (also referred to as 'economic sustainability') is generally understood as the ability of an economy to support a defined level of economic production indefinitely. Environmental sustainability is understood as the ability to continue indefinitely the rates of renewable resource harvest, pollution creation and non-renewable resource depletion (without causing the collapse of human systems dependent on the environment).[12]

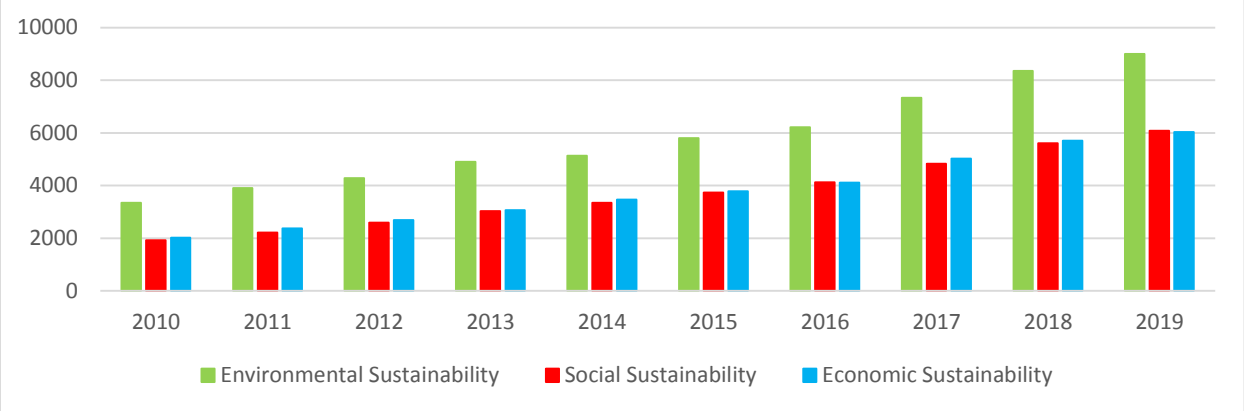
The social dimension of sustainability has so far been profiled less prominently in policy initiatives. It has also been interpreted more loosely than 'sustainable development' in general or 'environmental' sustainability. Sometimes referred to as 'social sustainability,' the term is so far little more than a 'container concept' for social outcomes and values, such as (freedom from) poverty, equality, social fairness, health equity, social responsibility, community resilience, social capital, etc. Globally, however, activists, researchers and, increasingly, policymakers consider that 'while there has been considerable work done on the environmental and economic aspects, the social has tended to fall off the sustainability agenda.'[13] The perception is that the sustainability discourse has concentrated too much on the environmental risks of economic growth at the expense of risks endogenous in human societies. As of late, symptoms of social decohesion due to unequal distribution of economic growth are placing new

[11] This prompted a high-ranking Commission official to admit in the aftermath of the crisis that 'Europe has a track record for inclusive growth, somehow lost in the last decades.' See European Commission (2016a) and Eurofound (2018), p. 1.
[12] See Gough (2017) and http://www.thwink.org/sustain/glossary/ThreePillarsOfSustainability.htm
[13] Barron and Gauntlet (2002).

emphasis on social sustainability.[14] To be sure, in the EU, the social dimension of 'sustainable development' figures prominently in EU primary law and many recent high-level initiatives, such as the European Pillar of Social Rights. However, it has so far lagged behind the economic and environmental dimensions in terms of how its implementation can best be pursued.

Figure 4. Research in sustainability issues keeps increasing

While the environmental dimension of sustainability has consistently captured most of the scientific community's attention, the social dimension has gained ground over the economic dimension of sustainability and finally surpassed it 2019



Note: Total number of publications (articles, book chapters, books, conference papers, business or press articles, short surveys, or reviews) in the social and economic sciences featuring one of the three dimensions of sustainability in the title, abstract, or keywords.
Source: Own visualisation based on 2011-2019 data from the ELSEVIER Scopus database, accessed on 21/01/2020.

The partly contested conceptualization of the three dimensions of sustainability has not stopped the concept's onward march to the mainstream. This is true for multinational business, policy advocacy, intergovernmental action, and scholarship. On what concernsthe latter, the popularity of sustainability is illustrated by an increasing volume of academic research on sustainable development in all its dimensions. The numbers show the enduring preponderance of the environmental dimension up to the present. In the last decade, the economic and social dimensions attracted roughly equal interest but consistently and considerably lower than the environmental. In 2019, the social dimension overtook the economic one in the production of scholarly research (see Figure 4 above).

2. Sustainability as an EU objective

The EU's strong commitment to sustainable development is one of the Union's fundamental objectives 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:

[14] See European Commission (2019a) and (2019b).

- presupposes enduring economic growth. This has to be underlined because key theorists of sustainability have advocated economic models which altogether abandon growth as an objective, settling instead for a 'steady-state' economy;[15]
- is based on macroeconomic stability without imbalances;
- should be pursued through a highly competitive 'social market economy' (i.e. a distinctly European model of economic policies[16] which promote free and fair market competition within a welfare state);
- should aim at full employment and social progress;
- should aim at protecting and improving the environment.

Moreover, article 3.5 TEU mandates the EU to strive for sustainable development not only domestically, but also 'in its relations with the wider world, the Union shall […] contribute to […] the sustainable development of the Earth…'

The social dimension figures prominently in EU primary law. Article 2 TEU conveys the strong social content of the EU's shared foundational values: 'The Union is founded on the values of respect for human dignity, freedom, democracy, equality, the rule of law and respect for human rights, including the rights of persons belonging to minorities. These values are common to the Member States in a society in which pluralism, non-discrimination, tolerance, justice, solidarity and equality between women and men prevail.' Article 3.3 TEU mentioned above also specifically commits the Union to 'combat social exclusion and discrimination, and shall promote social justice and protection, equality between women and men, solidarity between generations and protection of the rights of the child. It shall promote economic, social and territorial cohesion, and solidarity among Member States.' Furthermore, whether subsumed directly under 'sustainable development' or not, the content of the social dimension is broadly delineated in the Treaties through explicit or implicit references to the following aspects:[17]

- promotion of (high) employment (3.3. TEU and 151 TFEU);
- working conditions and their harmonisations across Member States (151 TFEU);
- the improvement of living conditions and their harmonisation across Member States (151 TFEU and implied under 'social progress;' in 3.3. TEU);
- welfare states (indirectly in 3.3 TFEU, through the stated preference for a 'social market economy');
- the fight against social exclusion and discrimination (2 & 3.3 TEU and 151 TFEU);
- (social) justice (2 & 3.3 TEU);
- human dignity and equality (2 & 3.3 TEU);
- (proper) social protection (3.3 TEU, 151 TFEU);

[15] This would include H. Daly, P. Ekins and I. Gough. See Daly (1977), Ekins (2017) and Gough (2017).

[16] The 'social' element to 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.

[17] Article 3.3. TEU in fact lists fundamental EU objectives emanating from foundational values presented in art. 2 TEU and from the EU's overarching aim (art. 3.1 TEU): 'The Union's aim is to promote peace, its values and the well-being of its peoples.' Article 151 TFEU elaborates on EU objectives related to human resource development, labour markets and social consitions: 'The Union and the Member States, having in mind fundamental social rights such as those set out in the European Social Charter signed at Turin on 18 October 1961 and in the 1989 Community Charter of the Fundamental Social Rights of Workers, shall have as their objectives the promotion of employment, improved living and working conditions, so as to make possible their harmonisation while the improvement is being maintained, proper social protection, dialogue between management and labour, the development of human resources with a view to lasting high employment and the combating of exclusion.'

- social dialogue (151 TFEU);
- human capital development (151 TFEU);
- gender equality (2 & 3.3 TEU);
- inter- or intra-generational solidarity (2 TEU);
- protection of the rights of the child (3.3 TEU);
- economic, social and territorial cohesion (3.3 TEU);
- and solidarity among Member States (3.3 TEU).

Under its most recent strategic framework, Europe 2020, the EU aimed to deliver on these employment and social objectives through the concept of 'inclusive growth'. The EU was not alone in comprising the social dimension of sustainable development under the label of 'inclusive growth,' i.e. economic growth that is distributed fairly across society and creates opportunities for all. International institutions such as the OECD, the World Bank, the United Nations Development Programme and the Asian Development Bank also developed similar agendas in the last decade based on own concepts of inclusive growth.[18] Whereas economic growth benefits from efficient product (and credit) markets and fair competition to allocate resources to their most productive use and incentivise innovation, the concept of inclusive growth is broader.

For the EU, inclusive growth means empowering people through opportunities for all throughout the people's lives. This requires investing in skills to attain high levels of employment and fight poverty, thus building a cohesive society. Given the faster pace of change today, inclusive growth also requires modernising labour markets, education, training and social protection systems to help people anticipate and manage technological transformation and more frequent labour market transitions. Europe 2020, as its precursor Lisbon strategy, also recognized that for economic growth to be inclusive it had to spread to all parts of the Union, 'including its outermost regions.' Europe 2020 also 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 both a measure of support for the EU's growth potential, benefiting all, and a matter of principle, with gains for the concerned individuals.[19]

Since 2017, high-level policy acts and guidance documents fleshed out in greater detail the EU's view on the social dimension of sustainable development. Through the Reflection Papers on the Social Dimension of Europe and on Harnessing Globalisation and the European Pillar of Social Rights, the EU defined the labour market and social domains and interventions that help sustain growth.[20] The experience of the crisis was key in identifying labour market and social aspects of consequential impact on growth.[21] The EU recognized the importance of the following aspects:

- **Continuously improving people's knowledge and competences is essential to sustain growth.** Education and training systems and lifelong learning opportunities have to meet the demand for better

[18] The OECD's concept focuses on the well-being of individuals and households and defines inclusive growth as a rise in the 'multidimensional living standards' of a target income group in society, such as the median household. In the World Bank's approach, inclusiveness refers to equality of opportunity in terms of access to markets, resources and unbiased regulatory environment for businesses and individuals. See OECD (2014), pp. 9-11 and World Bank (2019). Cf. Darvas (2018) for the situation in the EU.

[19] See European Commission (2017c).

[20] European Commission (2017a) and (2017b) and the Proclamation by the European Parliament, the Council and the European Commission on the European Pillar of Social Rights, 17 November 2017.

[21] See the Introduction to Eurofound (2018), pp. 1-2 for a commentary of the impact of the crisis on the renewed impetus to foster the social dimension in the EU.

and new skills coming out of fast technological transformation. Yet, several Member States have been overtaken in skills rankings by countries on other continents. More effective and equitable education and training systems can address skills mismatches and facilitate occupational mobility.

- **Fostering equal opportunities throughout people's lives, beyond access to education and training, is vital.** Helping everyone have a good start in life by overcoming difficult social conditions some are born into creates more skilled, cohesive and resilient societies where people can realize their potential. Enhancing equality of opportunities requires investment in children and youth, skills and lifelong learning, infrastructure adapted to elderly or disabled workers and in eliminating all forms of discrimination.
- **A more skilled labour supply has to be matched by the creation of quality jobs.** Job quality is an increasing concern in the new world of work. It is understood in terms of earnings, job security and safety working conditions, as well as social assistance networks, benefits, healthcare and childcare and pension planning. The degree to which EU economies can invest in high-quality jobs for a better-skilled labour force is therefore a determinant of socially sustainable growth and a priority for action.
- **Active labour market policies are indispensable.** They also need to operate on and instil a new, 'employment for life' as opposed to a 'job for life' perspective. Public services providing individualized support facilitate access to employment for all, help migrants integrate and ensure efficiency-enhancing mobility.
- **Promoting gender equality is necessary to overcome remaining gaps.** It can help women reap their full productivity potential, for their own and for society's benefit.
- **Working lives need and can be extended through health prevention and care.** Adaptive working environments also promote greater participation of elderly cohorts.
- **Poverty and social exclusion need to be tackled.** They undermine social cohesion and erect limitations to growth. Conversely, upward convergence in social outcomes contributes to sustained growth.
- **Welfare states, including social security systems, are instrumental in helping people cope with (increasingly frequent) transitions.** This is especially true for unemployment benefits during the crisis. Minimum income schemes helped people meet their basic needs and live in dignity. However, existing welfare states, riddled with limitations on coverage and access, are facing unprecedented challenges. To adapt to the changing face of work, they need to deliver new protections. Aside from delivering the right safety nets, they need to capacitate people to reach their full productive potential in order to prosper individually and as a society.
- **Civic participation, social and cultural capital and social dialogue are also economic assets.** They help increase trust across society and economic actors. They thus contribute to more consistent perceptions of reality and more consensual responses to challenges.

The European Pillar of Social Rights gave further prominence to the EU's social dimension and its 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 and stakeholders to work on all of the aforementioned aspects of the social dimension. The 20 principles and rights of the Pillar are a compass for upward convergence towards more equal opportunities and access to the labour market, fairer working conditions and more decent living conditions through social protection and inclusion. Thus, they can also be considered a 'to do' list for promoting more sustainable societies.

3. Criticism of Sustainability

Despite or perhaps because of its omnipresence, the sustainability paradigm has also received quite some criticism. First of all, its emergence out of environmental sciences and concerns concentrated attention to natural capital stocks. The rate at which such stocks were being depleted rather than regenerated, determined the degree to which these stocks would be available to future generations. Thus Brundtland's original definition of sustainable development, widely embraced, tended to place emphasis on intergenerational (rather than intragenerational) equity. It was thus deemed that, contrary to the concerns of some early proponents, sustainability as a policy paradigm tended to obscure attention to equity, power relations and justice across the same generation. [22]

Other critics deplore the 'fuzziness' to which excessive and diffuse use of the term has reduced sustainability. To them, sustainability has become little more than 'a listing of any societal objectives that various agents happen to think important'[23] or a catch-all term that captures some 'basic ideas of intergenerational justice when human well-being depends on natural capital and services.' [24] Environmental scientists and economists pointed out that the profuse evocation of sustainability risks depriving the term of clear, uncontested meaning and thus undermines its usefulness. One of the most criticized developments is that popular and official approaches to sustainability tend to equate sustainability with sustainable growth itself. In this approach, sustainability seems to be uncritically commensurate with economic growth combined with market-based approaches to conservation. Critics point out that in its original meaning, derived from environmental sciences, sustainability did not imply growth. In fact, those who attempted to re-found sustainability as a scientific field, tried to return to the original definition of the capacity of a system to persist in time regardless of growth.[25]

'Sustainable' policies in the developing world have also been criticized for an inherent tension between endogenous and exogenous definition of the goals of sustainability. Critics pointed out that defining system boundaries, system components and desirable attributes is not value-neutral. It is shaped by methodological tools, theoretical concerns, disciplinary and interdisciplinary norms and most often determined by outsiders (scholars, scientists, policy makers) to the systems examined. They rarely incorporate the practices and concerns of local (or indigenous) people who live their daily lives within these theorized systems on their own terms.[26]

Moreover, in the context of international economic relations, the sustainability paradigm has been criticized for placing the burden of adjustment on developing societies. This, argued economists from emerging economies, hampers progress on poverty reduction. The ultimate effect would be consolidation of intra-generational inequality across different geographical areas.[27]

Finally, the perception that 'sustainability' has been usurped by special interests has coined the term 'greenwashing'. Greenwashing is an unsubstantiated claim to deceive consumers into believing that a company's products are environmentally friendly.[28] The pervasive impression is that the same entities that were first held up as culpable for their unsustainable practices have in the meantime successfully internalized reproaches and refashioned themselves as pioneers of environmental sustainability. This includes international financial institutions and big corporations whose activities

[22] Agyeman et al. (2002).
[23] Brand and Jax (2007).
[24] See, for instance, Derissen et al. (2011), p. 1121.
[25] Costanza and Patten (1995).
[26] Berkes (2007); Thomas et al. (2016).
[27] Benessia et al. (2012).
[28] https://www.investopedia.com/terms/g/greenwashing.asp

happen to be among those most responsible for environmental degradation.[29] This allows the drivers of sustainability challenges — increasing use of fossil fuels, seemingly unending consumer demand, programmed obsolescence in production as well as the presumed necessity of continuous economic growth just to name a few — to escape unaddressed. For this reason, climate action champions criticize governments and big corporations for carrying on with 'business as usual', in the words of young climate activist Greta Thunberg at the December 2018 COP24 conference in Katowice.

Despite these criticisms, there is new and much-needed opportunity to raise the profile of the social dimension of sustainability. Among other, the Headline Ambitions of the new European Commission that came into office in December 2019, in particular the 'European Green Deal' and 'An Economy that Works for People and Planet', allow political priority to shift from financial and fiscal sustainability and rethink the way economy, environment and society intertwine in the EU.[30] The severe disruption of worldwide economic and social activity due to the coronavirus pandemic in 2020 also underlined the need to transform the socio-economic model in a manner that builds in resilience to unexpected shocks with unprecedented impacts. Recent research strongly suggests that the increasing frequency of outbreaks of animal-borne and other infectious diseases due to pathogens crossing from animals to humans (e.g. Ebola, SARS, bird flu, COVID-19) is linked to environmental degradation through human behaviour.[31] The disruption of pristine forests driven by logging, mining, road building through remote places, rapid urbanization and population growth is bringing people closer to contact with animal species they may never have been near before.[32] Therefore, to the extent that sustainability is a framework that imposes the internalisation of hitherto externalised costs, unexpected pandemics due to novel pathogens can be considered one more externality, one more of the previously hidden costs of human economic development. Taking all of the above into consideration complexifies the effort of making sustainability an *operational* concept, i.e. a concept which can be measured in the social and employment domains as well.

4. Measuring (social) sustainability

The rising importance of sustainability as an all-encompassing goal for human development has not led to consensus on how to measure the social dimension in particular. According to some, the concept is too unclear to lend itself to measurement as a policy goal, despite decades dedicated to exploring sustainability metrics. For this reason, since the 1980s, the concept of 'resilience'[33] has also been transferred from environmental sciences and engineering to social sciences, as a more practical framework for conceptualizing and tackling environmental and social challenges.[34] The relation between sustainability and resilience is not entirely settled in the social sciences. Some approaches see resilience as a subordinate point on a continuum of societal behavior (from adaptation to transformation) leading to

[29] Benson and Kirsch (2010); Goldman (2006).
[30] European Commission (2016a) and Eurofound (2018) deem that the surprising rise of euro-sceptic movements and the underlying societal unease due to rapid change in the socio-economic domain has provided new impetus for strengthening and speeding up the implementation of social dimension objectives. Cf. Algan (2017), Dustmann et al. (2017), Becker (2017) Chen (2018), Rodrik (2018) and De Vries (2018).
[31] The U.S. Centers for Disease Control and Prevention (CDC) estimates that three-quarters of "new or emerging" diseases that infect humans originate in nonhuman animals (https://www.cdc.gov)
[32] See Quammen (2012).
[33] Dictionary definitions of resilience are 1. the capability of a strained body to recover its size and shape after deformation caused especially by compressive stress and 2. an ability to recover from or adjust easily to misfortune, unexpected shock or change.
[34] See Folke (2006), Duit et al. (2010), Brown (2014), Bughin et al. (2018).

the ultimate strategic objective of sustainability, some reverse this relation, while other see resilience as a useful property in the service of pursuing a sustainability path. [35]

Measuring and assessing sustainability was a central concern of the 'Commission on the Measurement of Economic Performance and Social Progress' established in 2008. [36]The report of the Commission admitted the difficulty of devising measures that can accurately determine if current levels of well-being can be maintained for future generations. This difficulty can only be addressed through assumptions and normative choices. The report underlined 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 into a single indicator measures of current well-being and of sustainability or confusing the former for the latter. This means that measurement of *sustainability* in the employment and social domains cannot amount to the measurement of *current performance* in these domains, based on familiar stylised indicators.

Assessing sustainability requires a methodology based on 'stocks,' 'flows,' and 'tipping points.' The report of the 'Stiglitz Commission' concluded that any assessment of sustainability, in the economic, environmental or social dimensions, required a dashboard of indicators partly reflecting the methodology of the environmental sciences. This methodology would represent the variability of certain 'stocks' humans wish to sustain, i.e. quantities and qualities of natural, physical, human and social capital. It would also monitor 'flows' in and out of these stocks and quantify threshold values for each stock ('tipping points') beyond which adverse effects rise exponentially and/or incalculably.[37]

Because of the centrality of the environment in the sustainability paradigm, natural sciences have had a head-start in operationalizing sustainability. Accordingly, academic literature on measuring and adapting to global environmental and climate change has proliferated and continuously topped interest on the social or economic dimensions of sustainability (see Figure 4 above). So have national and international policy frameworks for combatting environmental degradation and climate change and setting quantified and measurable targets, as those governing CO2 emissions.

The environmental dimension based itself on quantifiable natural stocks while 'planetary boundaries' became environmental sustainability's 'tipping points'. Planetary boundaries are the levels of specific natural stocks within which humanity can continue to develop and thrive indefinitely. According to this paradigm, 'transgressing one or more planetary boundaries may be deleterious or even catastrophic due to the risk of crossing thresholds ('tipping points') that will trigger non-linear, abrupt environmental change within continental-to planetary-scale systems.'[38] For instance, competitiveness for the sake of economic growth may require some tolerance of damage to the environment, but, beyond a certain point, this damage may 'tip' the environment to a state which has non-linear negative impacts on society and, ultimately on economic growth itself.[39] By 2009, human activity was found to have crossed two of the planetary boundaries: genetic diversity and soil saturation by nitrogen exhibit values (see Figure 5 below).

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[35] Manca et al. (2017) overviews the epistemological roots of the concept of resilience in a historical context, but comes surprisingly close to making resilience a synonym of sustainability. It defines as resilient a 'society [which is] ... ensuring current wellbeing without seriously compromising that of future generations' and states that the objective of resilience 'matches a very general notion of sustainability.' Later improved versions of the same stream of research, such as Benczur et al. (2020), define sustainability as the ability of a system to return (to 'bounce forward') to a pre-defined, policy-relevant sustainability path following a shock.

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

[37] Stiglitz et al., p. 266.

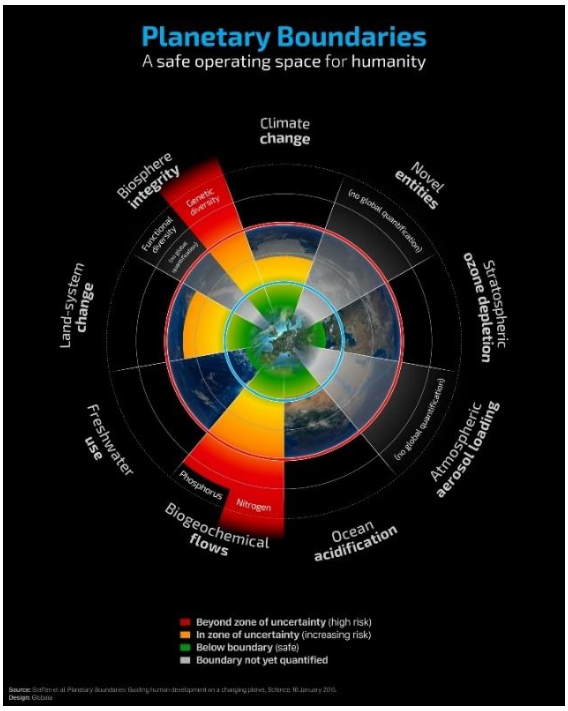
[38] The elaboration of planetary boundaries is owed to the Stockholm Resilience Center led by Professor Johan Rockström. See Rockström et al. (2009).

[39] Barbier et al. (2015), p. 72.

Figure 5. Human economic activity cannot operate beyond specific planetary boundaries without triggering asymmetrically negative impacts

The nine planetary boundaries including the two which have already been crossed by human activity (in red)

Source: Stockholm Resilience Centre



A strand of social science research has attempted to replicate methodologies of the environmental sciences to measure social sustainability. They have thus focused on the ability to sustain specific normatively defined goods (e.g. well-being) and/or capital stock(s) of crucial concern to human societies (e.g. human capital, social capital and institutional capital). [40] Prominent in such approaches has been the 'community' as the locus for the definition and implementation of the objectives of any sustainability action. Some research has defined social sustainability as 'a life-enhancing condition within communities, and a process within communities that can achieve that condition.' [41] Hence, these approaches view social sustainability as a grassroots, bottom-up responsibility par excellence.[42] Bundling together a number of public goods, social research of this strand has affirmed that 'social sustainability occurs when the formal and informal processes, systems, structures and relationships actively support the capacity of current and future generations to create healthy and liveable communities. Socially sustainable communities are equitable, diverse, connected and democratic and provide a good quality of life.'[43] Yet such operationalization of social sustainability suffers from lack of comparability across space and time. Additionally, the contested salience of various public good 'stocks' has hindered the elaboration of a coherent measuring framework for social sustainability. [44]

However, for social sciences, the 'stocks' method has been mostly a stumbling block on the way to assessing social sustainability. Given that societies do not behave the same way as natural stocks, plausible and universally applicable tipping points cannot be established for functions such as human capital, unemployment, inequality, poverty, etc. The difference in the behaviour of human societies as opposed to non-human organisms and eco-systems means that as sustainability, or resilience for that

[40] See, for instance, Smailes and Graeme (2000) and Pepperdine (2000), who makes strongly the point that 'any measurement of sustainability needs to include considerations of social issues. The significance of social sustainability as a component of the sustainability equation has been recognised in the agricultural sector in particular. An understanding of social sustainability can assist planning and policy development as the human and physical environment is interconnected.'
[41] McKenzie (2004), p.12.
[42] See Daly and Cobb (1994).
[43] McKenzie (2004), p.18.
[44] Jacobs (1999), p. 24.

matter, mutate from rather precise descriptive concepts in ecology to normative notions in social policy, they become 'diluted,' 'increasingly unclear' and burdened 'with many different intentions.' [45]

The 'capabilities' approach

Searching for the drivers of human prosperity, development economics elaborated the 'capabilities' approach, facilitating the operationalization of social sustainability. In his influential works, Amartya Sen grappled with the fact that the citizens' established rights to certain public goods are empty without active measures by governments to capacitate 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 realize their potential. [46] The capabilities approach inspired the creation of the UN's Human Development Index, which captures capabilities in health, education and income. [47] Strengths of this approach are: the emphasis of welfare economics on subjective individual choices; the contextualization of development efforts in a specific society with its regulatory, institutional and legal aspects; and the possibility of weighting indicators of development according to the situation in life.

Insights from the 'capabilities' approach can be useful in capturing better the social dimension of sustainability in the EU. Among other, they call for increased attention to the subjective experience of individuals, including the measurement of perceptions. The ability to adjust the weighting of indicators based on subjective salience of issues may facilitate policy solutions adapted to the EU's particularities. The most obvious of these particularities is that the EU is a region already boasting some of the most equal and inclusive societies, while it faces in more acute manner the global trend of demographic ageing. Therefore, standard solutions devised for regions with more room for improvement in their social domain may not be effective in the EU. The capabilities approach also favours diverse policies that empower challenged citizens to ameliorate their conditions through own action without unravelling the protective safety net provided by European welfare states. Novel research has adapted the rather global focus of the capabilities approach to the reality of the highly developed EU economies and added salience weights to each capability to determine the degree of convergence in the employment and social domain.[48]

The 'Doughnut Economy' and human need(s)

New interpretations and applications of sustainability and sustainable development continue to emerge. This is also due to the fact that the concept's still diffuse and broad meaning is also its strength. After all, at a higher level of abstraction, sustainability can be thought of as a paradigm that facilitates gaining an overview and achieving a balance between different goals and their intended or unintended effects. Thus, as sustainable development becomes the predominant paradigm encompassing all domains of human development within the planet's boundaries, it may require an extensive range of metrics rather than reliance on a single approach.

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[45] Brand and Jax (2007); Olsson et al (2015), p. 6. Note that some prefer 'resilience' as paradigm because they find that it lends itself more readily to quantification, whereas other researchers, such as Cote and Nightingale (2012) did so in order to shift away from environmental sciences and the quantitative availability of resources and focus instead on 'available response options.'

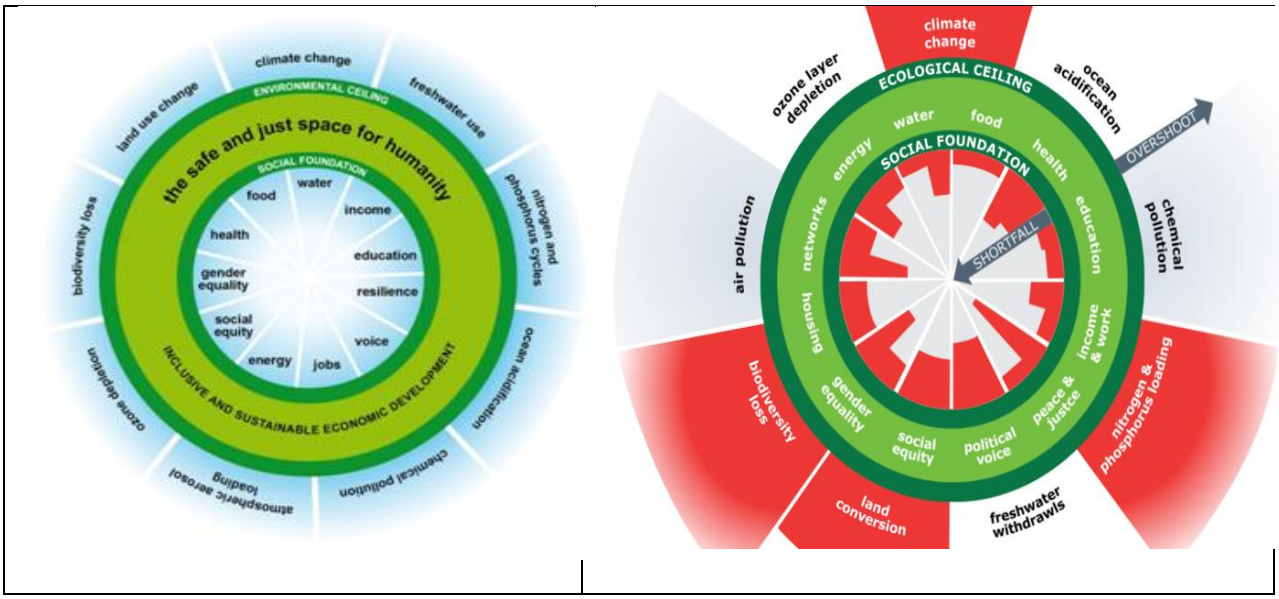
[46] The capabilities approach developed out of the collaboration of economists Amartya Sen, Sudhir Anand and James Foster and philosopher Martha Nussbaum. The operational dimensions of capabilities according to Nussbaum are: 1. Life, 2. Bodily Health, 3. Bodily Integrity, 4. Sense, Imagination and Thought, 5. Emotions, 6. Practical Reason, 7. Affiliation, 8. Other Species, 9. Play, 10. Control Over One's Environment. See M. Nussbaum and A. Sen, eds. (1993) and Sen (1999).

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

[48] See Hancké and Axisa (2019), pp. 9-14.

Figure 6. The 'Doughnut' economy

Intended as a truer-to-reality illustration of the economic system, the 'doughnut' has utilized the concept of 'planetary boundaries' concept to integrate economy, society and environment in a telling visualisation



Source: Raworth (2017).

'Doughnut economics' and the concept of 'human need' provide ways out of the impasse of unquantifiable tipping points, which has held back attempts to measure social sustainability. The 'doughnut' is a visual framework for sustainable development inspired by the concept of (the nine identified) planetary boundaries and complementing it with (twelve) 'social foundations.' The framework is named after its visualisation, as a disc with a hole in the middle. The hole depicts the share of people that lack access to life's essentials (healthcare, education, equity and so on) while the outer rim represents the ecological ceilings (planetary boundaries) which can only be overshot at the risk of incalculable damage to life –human and other. Oxford economist Kate Raworth conceived the model as an alternative to classical depictions of the economy, which left outside important externalities (such as depletion of environmental resources). [49] In addition to the work of the Stockholm Resilience Centre, Raworth drew inspiration from years of hands-on development work in Africa, where insufficient stocks of crucial social foundations was an omnipresent impediment rather than a theoretical intellectual challenge. The doughnut model considers an economy prosperous when all of social foundations are met without overshooting the ecological ceilings. This state of prosperity, called 'a safe and just space for humanity', is situated between the two rings.

Combining the doughnut's social foundations with the concept of objective human needs could advance the search for the definition and quantification of social boundaries (or 'foundations' or 'tipping points'). Welfare economist Ian Gough challenged the view that human needs are essentially subjective, by exploring the individual and social prerequisites of any human action. To Gough, the goal of progress in meeting human need is rational and practicable, provided that further communicational, constitutional and ecological prerequisites are in place. Establishing 'objective' levels of human need which should be met as a matter of urgency, with the understanding that shortfalls in this respect could be more damaging to social cohesion than, say, income inequality, can remove a major stumbling block on the way to establishing social sustainability metrics.[50]

[49] Raworth (2017).
[50] Gough (2017).

5. Assessing social sustainability through EU strategic monitoring frameworks

Europe 2020

Issued in early 2010, the Europe 2020 strategy is consistent with the three-dimensional view of sustainability. The strategy's overarching goal is 'growth', but its success requires this growth to be knowledge-based, innovation-driven and productivity-enhancing ('smart growth'). Also, growth has to be equitable, delivering high employment and improvements to everybody's living standards ('inclusive growth') and thus fostering social and territorial cohesion. Finally, growth has to be resource-efficient and low-carbon, preventing environmental degradation and biodiversity loss ('sustainable growth').[51] Such policy statements placed the three dimensions of sustainable development on equal footing. The strategy's monitoring framework translated key objectives at EU level to quantified targets monitored by stylized indicators in the areas of employment (employment rate); research and development (R&D investment as share of GDP); climate change and energy (greenhouse gas emissions, share of renewable energy sources, energy efficiency); education (share of early school leavers, tertiary education attainment) and poverty and social exclusion (at risk of poverty and social exclusion-AROPE).

The metrics of Europe 2020 have allowed easy comparability across Member States and have become the basis for focusing and coordinating policy efforts better than ever before. However, reservations have been expressed over the difficulty of gaining overview of the social dimension in individual Member States by following the indicators established for the few headline targets. Other reservations concern the appropriate *use* of the measurement (regardless of its accuracy), i.e. the degree to which an indicator chosen is a good proxy for the function policy really wants to track. This is the case, for instance, of the indicator regarding the share of 30-34 year-olds with tertiary education attainment. To some extent this also applies to the at-risk-of-poverty (AROPE), which may be more telling as an indicator of inequality than of living standards. The need to extend the metrics for the social dimension in future monitoring frameworks has been pointed out, notably through the inclusion of new indicators, including those specific to population sub-groups (e.g. in-work poverty, child poverty, employment rate of older workers, underachievement in education, gender employment gap and possibly similar gap measures for vulnerable groups such as people with disabilities).

Sustainable Development Goals

In September 2015, the United Nations adopted the resolution on the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs). This 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.[52] Through the UN 2030 Agenda, the international community committed to end poverty, protect the planet and ensure prosperity and peace for all.

The EU was one of the leaders in the formulation of the SDG agenda and has taken follow-up action towards its implementation. In 2016 the European Commission announced the mainstreaming of the SDGs into EU policies and initiatives, with all new policies having 'to take into account the three pillars of sustainable development, i.e. social, environmental and economic concerns.'[53] The following

[51] European Commission (2010).
[52] Access the UN resolution at https://sustainabledevelopment.un.org/post2015/transformingourworld.
[53] See European Commission (2016b), p.18 and its precursor Note by K. Falkenberg, Senior Adviser for sustainable Development to the President of the European Commission, in European Commission (2016a).

year, 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.'[54] 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. The Reflection Paper complemented a series of other Reflection Papers launched before, including on the Social Dimension of Europe and on Harnessing Globalisation.[55] It aimed at stimulating further reflection on the vision of a sustainable EU and a strategy for implementation of sustainable development goals. Aspiring to consolidate the EU as a global trailblazer in sustainable development, the Reflection Paper 'Towards a Sustainable Europe by 2030' outlined policy choices for setting the EU's economy on a path towards sustainability, while taking account of the inextricable links between its dimensions, each facing particular challenges.[56]

The new Commission that came into office at the end of 2019 upgraded the integration of the SDGs in EU policy monitoring and coordination. The European Semester was refocused, beginning with a broader economic narrative put forward in the Annual Sustainable Growth Strategy. Country reports feature a reinforced analysis and monitoring on the SDGs, including on the contribution of macroeconomic policies to their delivery. Each Country Report also includes a new annex setting out the individual Member States' SDG performance. Under the refocused Semester cycle, Commission proposals for country-specific recommendations should highlight the contribution of national reforms to progress towards delivering on specific SDGs, where instrumental to ensure the coordination of economic and employment policies.

The indicators for monitoring the implementation of SDGs in an EU context are more numerous and diverse than under Europe 2020. 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. [57] The indicators enable a more extensive view into the evolution of human capital and social outcomes in the EU. Yet they concentrate on trends and outcomes rather than assessing the sustainability of current well-being. The multitude of indicators under the 17 SDGs reflect functions which can be considered as levers for sustainable development. This could be said, for instance, for the measure of 'investment share of GDP' (SDG 8, 'decent work and economic growth') because of the known positive effect fixed capital formation can have in sustaining productivity in the long term. Similarly, the measure of 'gender employment gap' under SDG 5 ('gender equality') monitors the differential employment rates of women and men and closing this gap both promotes equal opportunities and can incentivize labour market activation - crucial to sustaining the EU's labour force.

[54] European Commission (2019a).

[55] 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 mutlilateral set of global rules and a common agenda.

[56] The Reflection Paper proposed the promotion of a circular economy, sustainable production and consumption, including in the agro-food and energy sectors, and a socially fair transition to ecologically sustainable economic growth. The Paper also identified domains in which policy action can foster 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. See European Commission (2019a), which was followed by European Commission (2019b) and (2019c); they outlined long-term structural trends with economic, technological, societal and governance-related risks, such as significant growth divergence between countries, regions and businesses, changing demographics and rising inequalities, unsustainable consumption patterns, societal unease with rapid pace of change; rising protectionism; and climate change.

[57] European Commission (2016), p.16; see also Eurostat (2018).

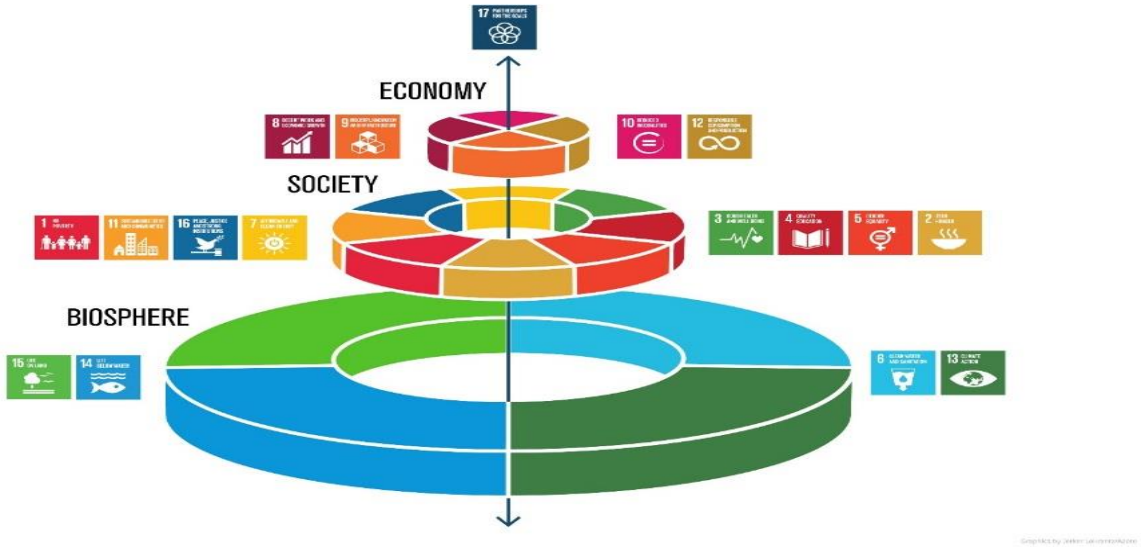
Common to all these monitoring frameworks is the effort to assess the social dimension of sustainability through stylized indicators of labour market and social outcomes. These are indicators such as employment, activity and unemployment rates and their breakdowns, Gross Disposable Household Income and its distribution,[58] the rate of people at risk of poverty and social exclusion and its breakdowns, in-work poverty, gender gaps, etc. This heuristic approach can and does often uncover a treasure of important evolutions but still misses the measurement of the longitudinal, temporal dimension of performance under each such indicator.[59] Moreover, it foregoes any attempt at exploring the interplay between indicators and how they may reinforce each other or not.

Figure 7. Conceptual and monitoring frameworks begin to merge

The 17 Sustainable Development Goals arranged in rows (original design) as well as in a circle, to elicit association with the holistic approach to sustainability and as superimposed layers of a 'wedding cake', to re-emphasize the primacy of the environment and to attribute specific SDGs to one of the three dimensions.

[58] Income distribution is typically measured through the Gini coefficient and the S80/S20 ratio.

[59] In Eurofound (2018) convergence in the employment and socioeconomic area is not theorized in terms of its drivers (the way convergence in economic growth is theorized in neo-classical economics) but is defined as convergence in the fields of application of 'employment' and 'socioeconomic area.' Even the 'Stiglitz' Commission itself has not escaped criticism for failing to propose new measures for the social dimension. See Noll (2011).



Source (from left to right and bottom): United Nations; Sustainable Development Solutions Network; Stockholm Resilience Centre.

The Social Scoreboard

Assessing performance in the social dimension in the EU has been greatly improved since the European Pillar of Social Rights and the monitoring tool that accompanies it - the Social Scoreboard. The EU economic policy coordination under the European Semester uses the Social Scoreboard to monitor performance in the social dimension of the EU. This has greatly improved the connection between analysis and policy steering. The Social Scoreboard helps to monitor the situation of Member States on measurable dimensions of the European Pillar of Social Rights, complementing other monitoring tools, e.g. the Employment Performance Monitor and the Social Protection Performance Monitor. The Scoreboard uses 14 stylized headline indicators, monitored by Eurostat. Some of them were taken up in the context of measuring progress towards the 17 Sustainable Development Goals in the EU. Despite the high relevance of Scoreboard's indicators, the general difficulty of conflating current and longitudinal aspects of performance in the social domain (which the 'Stiglitz report' had identified) has not been overcome by the Scoreboard's methodology.

The European Commission which took office in December 2019 gave new impetus to the implementation of the Social Pillar through a dedicated action plan. This may well add importance to the Social Scoreboard as a dynamic tool for monitoring the social dimension in the EU. By evaluating the development of certain indicators in Member States, the Scoreboard ascertains the positive or negative direction of the evolution and can assist policy target-setting to influence the direction and speed of this evolution.[60] Part of the Scoreboard's strength may lie in the similarities of its methodology to the 'stocks,' 'flows' and 'tipping points' approach. The Scoreboard looks at levels (similar to 'stocks') and yearly changes (similar to 'flows' in and out of these levels) of each of the headline indicators. Levels and changes are classified according to their distance from the respective EU averages. Member States' performances on levels and changes are then combined (by using a predefined matrix) so that each Member State is assigned to one out of seven categories ('best performers', 'better than average',

[60] As Apgar et al. (2015) point out, 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.

'good but to monitor', 'on average/neutral', 'weak but improving', 'to watch' and 'critical situations.' Persistent performance under 'critical situation' could be considered akin to crossing a 'tipping point'.

6. Social Scoreboard Factor Analysis Tool

Assessing social sustainability the EU's Member States (hereafter MS) can be improved by utilizing further the Social Scoreboard. The Scoreboard's (14) headline indicators, headline-indicator breakdowns and supplementary indicators monitor performance in the three main fields of the Pillar: equal opportunities and access to the labour market; dynamic labour markets and fair working conditions; public support/social protection and inclusion. They are broken down in twelve subfields (e.g. education, skills and lifelong learning, gender equality in the labour market, labour force structure, income, early childhood care, healthcare, etc.).

The Scoreboard monitors, analyzes and visualizes in a number of ways the evolution in the performance of the MS. Tables, maps and heat maps measure distance from targets (for Europe 2020 indicators) and compare the MS between and with themselves, so as to ascertain the direction and speed of (annual) change and inform policy accordingly.

Yet there is still scope to improve upon the many existing ways of analysing Scoreboard data. One way to do that is an explorative factor analysis conducted on the variables that are inputted annually in the Social Scoreboard.[61] The added value of the results of this factor analysis lies in the following:

- **Better overview:** This factor analysis reduces the otherwise large number of variables included in the Scoreboard to just three principal components, conveying a Member State's overall performance in what could be broadly defined as the 'social dimension' as well as its position relative to others in a more concise manner, which is presumably better-suited for attracting policy attention.
- **Better perspective:** By collapsing a large number of variables into a small number of factors, the analysis paints a broad-brush picture of specific MS' performance and position relative to others, which may be used as background against which it is possible to evaluate more judiciously the annual evolution of individual indicators. This can be of crucial importance in decision-making about policy recommendations in the context of the Semester. For instance, our analysis can help place in the right perspective a *prima facie* alarming year-on-year evolution of a single indicator (e.g. a proportionally large rise in the early school leavers rate of CY in 2018, albeit remaining well below the EU average and being based on LFS data derived from a small sample).
- **Better policy targeting:** Reducing the large number of the Scoreboard's variables to a small number of factors helps to reveal synergies between different subfields of the labour markets and social domains. This provides additional clues as to the levers policy can use to influence performance in each one of these subfields. This can help policy operate more efficiently by concentrating public resources on the subfields with the most important positive impacts/spillovers.

BOX: THE SOCIAL SCOREBOARD

The Social Scoreboard is a central tool for monitoring performance in the employment and social domains as well as convergence towards better living and working conditions. The methodology for analysing headline indicators has been agreed by the Employment Committee and the Social Protection Committee. The Scoreboard's 14 headline indicators assess employment and social trends in:

[61] A factor or principal components analysis is a statistical method used to describe variability among observed, correlated variables in terms of a potentially lower number of unobserved variables called factors. The exercise in this paper is inspired by a similar exercise in Chapter 2 of *Employment and Social Developments in Europe* 2019.

- **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 less than 3 years in formal childcare
- Self-reported unmet need for medical care
- Share of population with basic overall digital skills or above.

Selection and manipulation of input data

The aim of this exercise was to arrive at a meaningfully reduced subset of variables, still covering the whole spectrum of fields included in the Scoreboard. We aimed for the most recent year for which there was fully available data. The point of departure was the full set of (94) variables used by the Social Scoreboard. Eliminating indicator breakdowns (e.g. adult participation in learning rates by gender) as well as certain indicators that are highly correlated with or derived from others (e.g. activity rate) we arrived at a subset of 28 variables. The year 2017 was the most recent one for which data for all variables and MS were available with a few exceptions in:

- 'Gender pay gap in unadjusted form' (EL, IE)
- 'labour transitions from temporary to permanent contracts' (MT)
- 'out-of-pocket expenditure on healthcare' (MT) and
- 'individuals' level of digital skills' (IT)

We filled the gaps in the first two variables above by substituting 2014 data for all MS (for consistency). For the third variable above, we substituted 2015 data for all MS. We were able to substitute 2016 data for the last variable, only for Italy, where 2017 data was missing. Data for the variable 'net earnings of full-time single worker without children earning an average wage (levels in PPPs, three year average)' was consistently missing for CY. Rather than omit the variable (an option we rejected because we had also had to omit the income-related variable 'GDHI per capita index' due to missing data), we excluded observations along all variables for CY. For this reason, the explorative factor analysis covers 26 MS (plus the UK). The 28 variables retained and inputted in the factor analysis are listed in Annex 1.

The principal components of the social dimension of the EU ('social sustainability') based on the Social Scoreboard

The last three columns in the table below present the three principal components (factors) as they were extracted from the analysis. The table shows how much each factor correlates ('factor loadings' in the

rows of the last three columns) with each original variable (first column), where such correlations have a value higher than 0.5.

	Principal Component		
	Skilled and healthy human capital	Low-performing welfare state failing to check social risks	Efficient labour market
Adult participation in learning	,641		
Aggregate replacement ratio for pensions			
At risk of poverty or social exclusion (in %)		,859	
At-risk-of-poverty rate		,922	
Children aged less than 3 years in formal childcare	,811		
Connectivity dimension of the Digital Economy and Society Index	,678		,519
Early leavers from education and training (% of population aged 18-24)		,519	
Employment in current job by duration - 1- 2 years			,700
Employment rate (% population aged 15-24) - 15 - 24			,675
Employment rate (% population aged 20-64)			,879
Gender employment gap			-,587
Gender gap in part-time employment	,749		
Gender pay gap in unadjusted form (2014)			,511
General government expenditure - education			
General government expenditure - health		-,697	
General government expenditure - social protection			
Healthy life years (at the age of 65) - female	,838		
Healthy life years (at the age of 65) - male	,875		
Impact of social transfers (other than pensions) on poverty reduction		-,702	
Income quintile ratio (S80/S20)		,896	
Individuals' level of digital skills	,610		
In-work at-risk-of-poverty rate		,681	
Labour transitions from temporary to permanent contracts (2014)			,687
Long term unemployment			-,735
Net earnings	,864		
Out-of-pocket expenditure on healthcare (2015)		,669	
People living in households with very low work intensity			
Self-reported unmet need for medical care			

Note: Summing up the (squared) loadings along one variable gives the variable's 'communality'. Summing up the (squared) loadings over one factor gives the factors' 'Eigenvalue'.

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

Together, the three factors can replace almost two-thirds (62%) of the explanatory power of the full set of variables included in the Social Scoreboard. The factors can be described as follows:

Factor 1: Skilled and healthy human capital

This factor is characterized by relatively high factor loadings in skills- and health-related variables, thus depicting an important part of the overall quality of human capital. As known, these traits are correlated with high productivity and high earnings. Factor 1 has the highest explanatory power of the three factors.

It explains 22.508% of the cross-country variance in the 28 variables included in the analysis. MS scoring high on this factor also score high on:

- Skills-related variables such as adult participation in learning, individuals' level of digital skills and digital connectivity as well as high levels of participation in formal childcare for the ages of up to 3 years (which is linked to the development of better cognitive skills at an early age, in addition to increasing labour participation of mothers).
- Good health, as indicated by 'healthy life years at the age of 65' for both men and women.
- Higher part-time employment for women than for men, revealing a gender gap in this respect, which may also be linked with the higher full-time employment rates of men in ICT-related industries (these are countries with high levels of digital skills, presumably linked with high employment in related fields).
- Net earnings, presumably linked to the high productivity of workers with good digital skills.

Factor 2: Low-performing welfare state failing to check social risks

This factor is expressed with negative values. In other words, it is characterized by high correlation (high factor loadings) with social risks such as poverty (incl. in-work poverty) and inequality. The higher the values the higher the correlation with such social risks. Conversely, it is low factor loadings under this factor which signify a positive situation. If inverted, this factor would underline the importance of social welfare policies and would be expressed positively as 'Effective welfare state checking social risks'. The explanatory power of Factor 2 is only slightly lower than that of Factor 1. The factor explains 21.014% of the cross-country variance in the 28 variables included in the analysis. MS scoring high in this indicator also score high on:

- Variables for preeminent indicators of poverty and inequality, such as AROPE, AROP, in-work at-risk-of-poverty rate and the S80/S20 income quintile ratio.
- Low effectiveness of the welfare state in keeping social risks in check, as indicated by low government expenditure on health, consistent with high out-of-pocket expenditure on health and low impact of social transfers (other than pensions) on poverty reduction.
- High rates of early leavers from education and training.

Factor 3: Dynamic labour market

In contrast to Factor 2, factor 3 has a strong positive connotation, reflecting traits of a dynamic, fluid labour market. It explains 18.083% of the total cross-country variance in the 28 variables included in the analysis. MS scoring high in this indicator also score high on:

- Employment-related variables such as employment rate for both young and prime-age workers, low gender employment gap, low long-term unemployment.
- Relatively quick and 'upward' transitions between jobs and employment statuses, as indicated by high correlation with employment in current job for a duration of 12-23 months and high labour transitions from temporary to permanents contracts.
- The connectivity dimension of the Digital Economy and Society Index, completing the picture of a dynamic, increasingly technology-intensive labour market.
- The unadjusted gender pay gap (difference between average gross hourly earnings of male and female employees as percentage of male gross earnings), attesting to the persistence of the gender pay gap even in well-performing labour markets, possibly linked also to the high technology-intensity of the labour market.

A taxonomy of social sustainability in the EU: four clusters

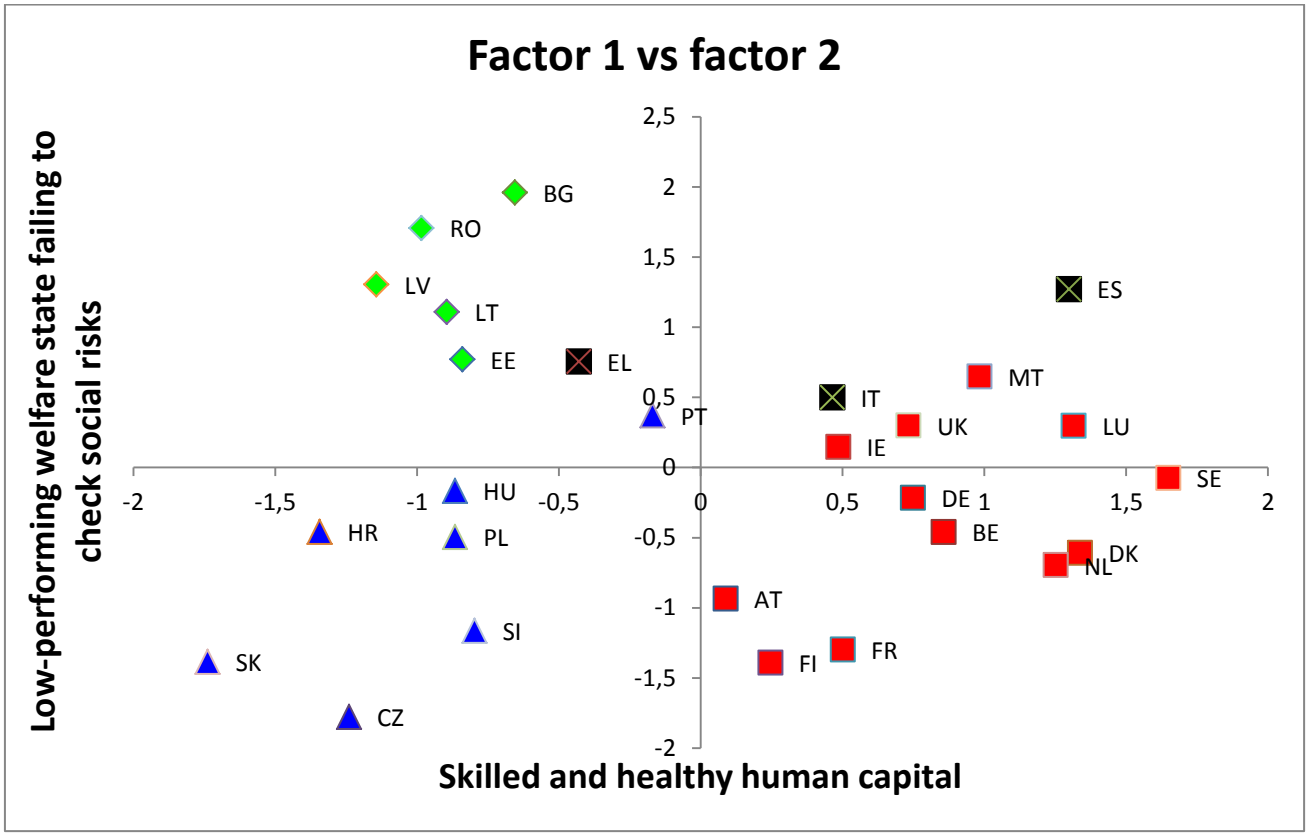
Based on the factors presented and described above, it is possible to show how MS score on each of the factors and how they compare to one another by establishing groups (clusters) of MS with similar scores in the factors.

This paper has plotted each factor against the other and shows the two most revealing plots, i.e. factor 1 vs factor 2 and factor 2 vs factor 3. The factors of the former plot represent 44% of the total variance, while those of the latter represent 39% of the total variance. The colours chosen for the chart reflect the clusters identified among 26 MS (plus the UK), based on all three factors. Factor values are standardized to ensure that a value of zero reflects the unweighted average across all MS. Four clusters of MS with similar characteristics can be observed:

North-East and South-East Periphery: Comprising the Baltic countries (LT, LV, EE) and the eastern Balkans (BG, RO), this group clearly stands out in both plots for its high scores on factor 2 and below-average human capital in terms of either skills *or* health (or both). The cluster is somewhat split into subgroups with regard to the dynamism and efficiency of the labour market (factor 3), with the Baltics leading the EU whereas BG and RO are close to the EU average in that respect. In fact, EE is emblematic of this cluster in terms of its score under factor 3, since it known for the dynamism of its labour market although it also leads the EU in the unadjusted gender pay gap.

South: The three largest MS of the South of the EU (IT, ES, EL) also stand out as a group in both plots, due to the high incidence of social risks and the ineffectiveness of the welfare state in dealing with them as well as the low dynamism of their labour markets. Spain and Italy fare better than Greece in terms of the skill and health of human capital, while the latter scores below the EU average in this factor.

East-Central Europe: The cluster comprises six of the MS which acceded to the EU in 2004 or later, together with Portugal. The case of Portugal is interesting, because its performance in the last few years, possibly also due to the reforms enacted in the aftermath of the Great Recession and the adjustment programme to which the country was subjected, has begun to 'peel it off' its traditional classification with other MS of the South. In the first plot, representing the two factors with the largest explanatory capacity, this cluster stands out clearly against the others. It is marked by below-EU-average scores on factor 1 (skilled and healthy human capital) but also by lower social risks and more efficient welfare states, performing markedly better than either the South-East or the North-East and South-East Periphery in this factor (2). Portugal lies slightly apart from the rest, with social risks and a welfare system that are performing closer to those of southern MS but with better-skilled and healthier human capital than the East-Central European MS in this cluster. In the second plot, showing factors 2 and 3, most of the MS of this cluster are close to EU average in terms of labour market dynamism.



North and Western Europe: This is the cluster with the highest number of pre-2004 MS covering North and Central Europe, together with Malta. It stands out more clearly in the first plot, marked by some of the best (and in all cases above-average) performances in terms of human capital as well as by average to better-than-average scores on social risks and the ability of welfare systems to contain them (factor 2). In the second plot, this cluster exhibits a partial overlap with East-Central Europe, albeit with more dynamic labour markets (factor 3) than East-Central Europe, on the whole.

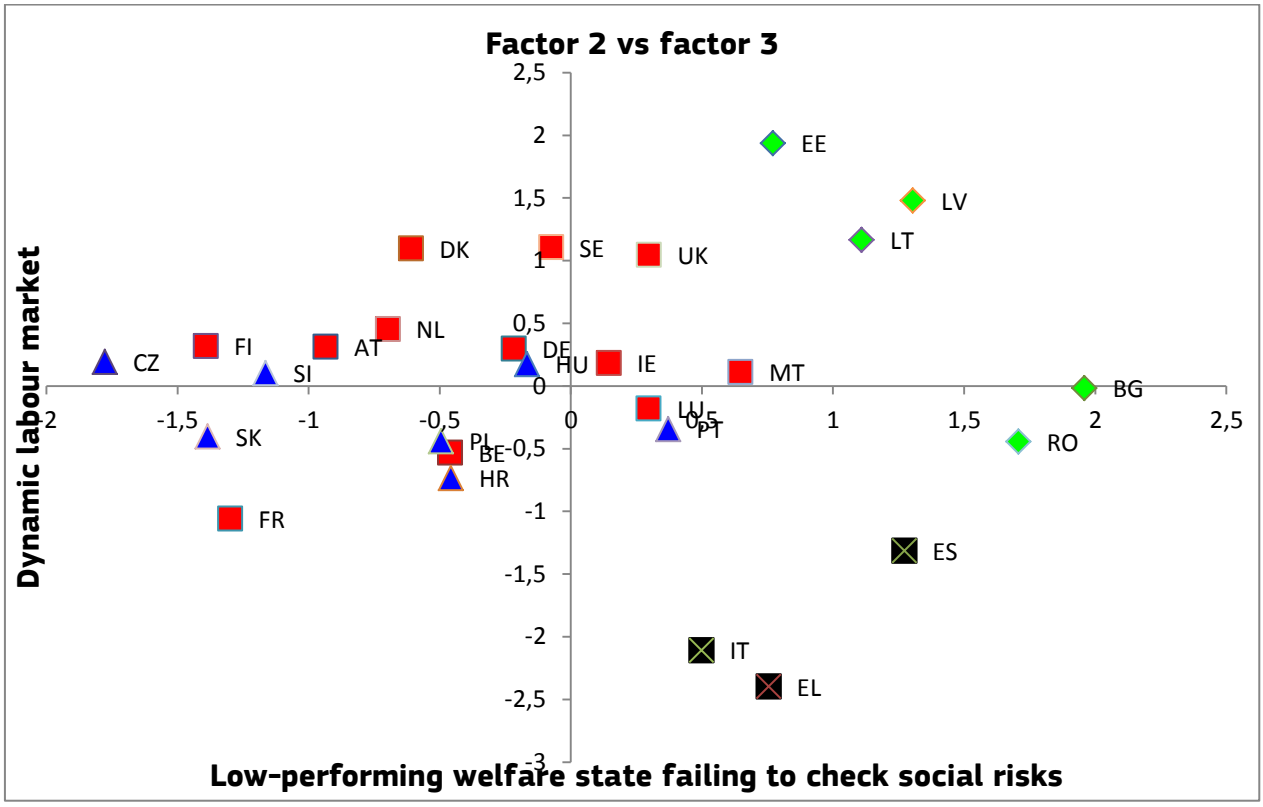
In conclusion, priorities in each of the clusters should rather place emphasis on the following:

North-East and South-East Periphery: improving the skills and/or health of human capital; fighting social risks.

South: raising the effectiveness of the welfare systems in fighting social risks; improving the functioning of labour markets**.**

East-Central Europe: improving the skills and health of human capital; raising further the efficiency of labour markets.

North and Western Europe: in most MS of this cluster, too, there is room for further improvements in the functioning of the labour markets.



Conclusion

In the last two decades, the concept of sustainability in its economic, social and environmental dimensions has risen to the status of a global reference framework for explaining, monitoring and steering all human activity. Despite the prominence of the concept in research and policy, operationalizing social sustainability has lagged behind the other two dimensions. Existing monitoring frameworks for the social dimension devised by the EU have managed to provide increasing clarity about the state of the society in the EU. However, they have not been able to differentiate the measurement of the current from the future performance and thus truly assess the degree of sustainability of current practices and outcomes.

New, holistic monitoring frameworks, such as 'Doughnut Economics', have provided the basis for more objective definitions of human needs and necessary capabilities. They have thus advanced the search for values that could be used as thresholds (e.g. 'social foundations') to be met in the social domain, in order to allow European society to thrive in future generations as well. Nonetheless, most of these novel approaches have emerged out of considerations at global level. The EU's already high living standards mean that these approaches need to be adjusted to the developed economies of the Member States to become truly relevant in the EU context.

The Social Scoreboard is thus far the most suitable framework for capturing the evolution in the social dimension in the EU but it could be improved though new approaches. This paper proposes an additional way of utilizing the Scoreboard for policy purposes: it applies a Factor Analysis on the scores of all variables in the Scoreboard in order to identify the principal components of sustainability. There is also scope for further research. Part of this research could focus on making the Social Scoreboard the basis for adapting to the EU-context novel approaches that seem promising for quantifying boundaries for the social domain. This can provide the necessary *quantified* basis against which to assess long-term

social sustainability in the EU. This analysis could take into account the regional dimension of the Social Scoreboard.[62]

Annex 1: The variables used in the Social Scoreboard Factor Analysis

Adult participation in learning	General government expenditure - health
Aggregate replacement ratio for pensions	General government expenditure - social protection
At risk of poverty or social exclusion (%)	Healthy life years (at the age of 65) - female
At-risk-of-poverty rate	Healthy life years (at the age of 65) - male
Children aged less than 3 years in formal childcare	Impact of social transfers (other than pensions) on poverty reduction
Connectivity dimension of the Digital Economy and Society Index	Income quintile ratio (S80/S20)
Early leavers from education and training (% population aged 18-24)	Individuals' level of digital skills
Employment in current job by duration - 1- 2 years	In-work at-risk-of-poverty rate
Employment rate (% population aged 15-24)	Labour transitions from temporary to permanent contracts (2014)
Employment rate (% population aged 20-64)	Long term unemployment
Gender employment gap	Net earnings
Gender gap in part-time employment	Out-of-pocket expenditure on healthcare (2015)
Gender pay gap in unadjusted form (2014)	People living in households with very low work intensity
General government expenditure - education	Self-reported unmet need for medical care

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[62] A number (not all) of Scoreboard variables are available at regional level. A qualitative analysis by the European Committee of the Regions (2019) broadly confirms the clusters of countries around the four dimensions derived here. For example, people in Southern and Eastern European regions tend more to being at risk of poverty and social exclusion than is the case in the rest of the EU. Those are the countries scoring least favourable on the 'low-performing welfare state' factor extracted above. Likewise, regional employment and unemployment figures confirm our findings on the 'dynamic labour market' factor.

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