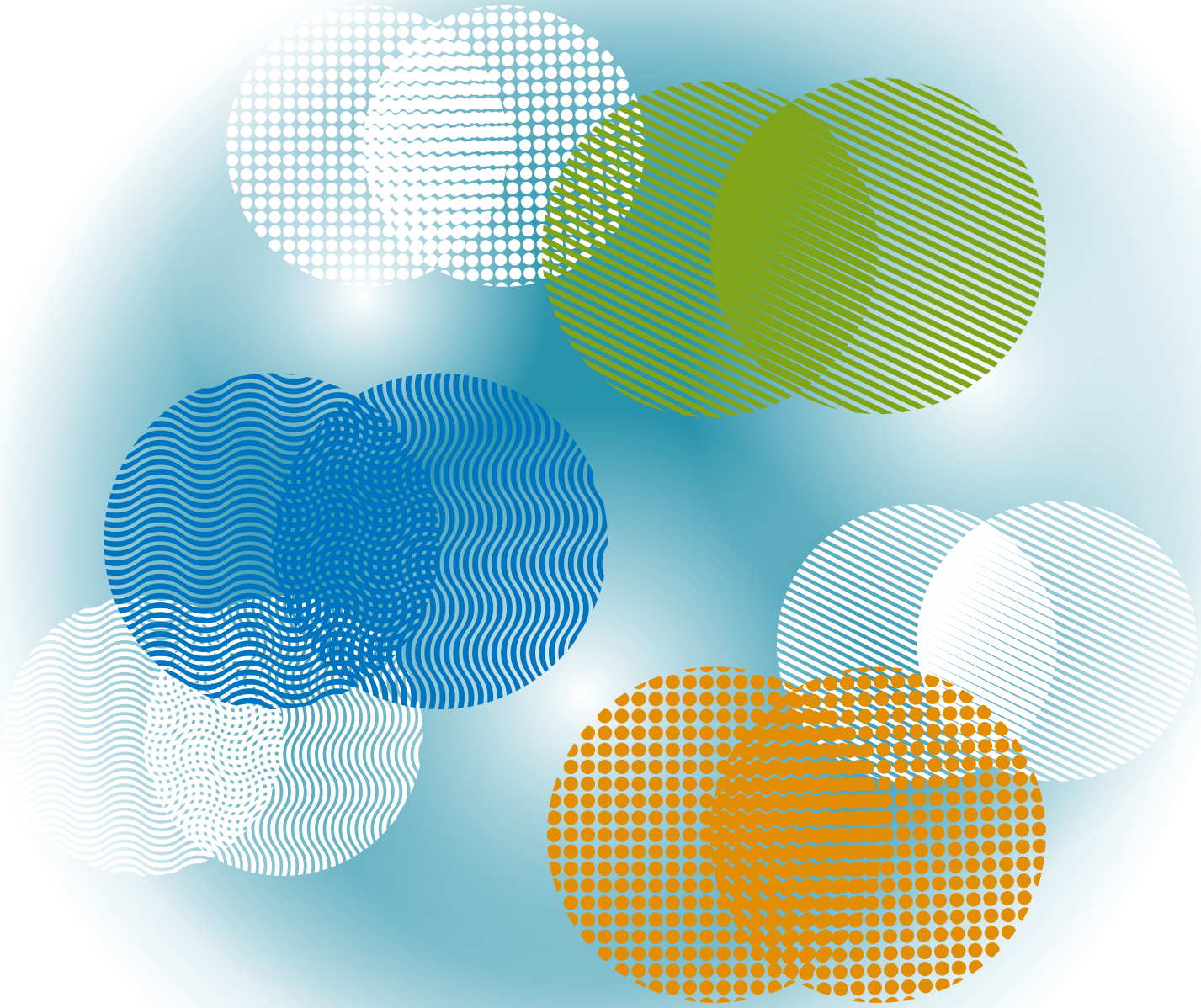
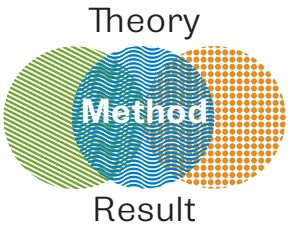
Eurasian Economic Commission
United Nations Conference on Trade and Development

INCLUSIVE GROWTH

of the Eurasian Economic Union Member States: assessments and opportunities




Theory
Method
Result

This report is a joint study by the Eurasian Economic Commission (EEC) and the United Nations Conference on Trade and Development (UNCTAD) published in partnership with Interstate Bank

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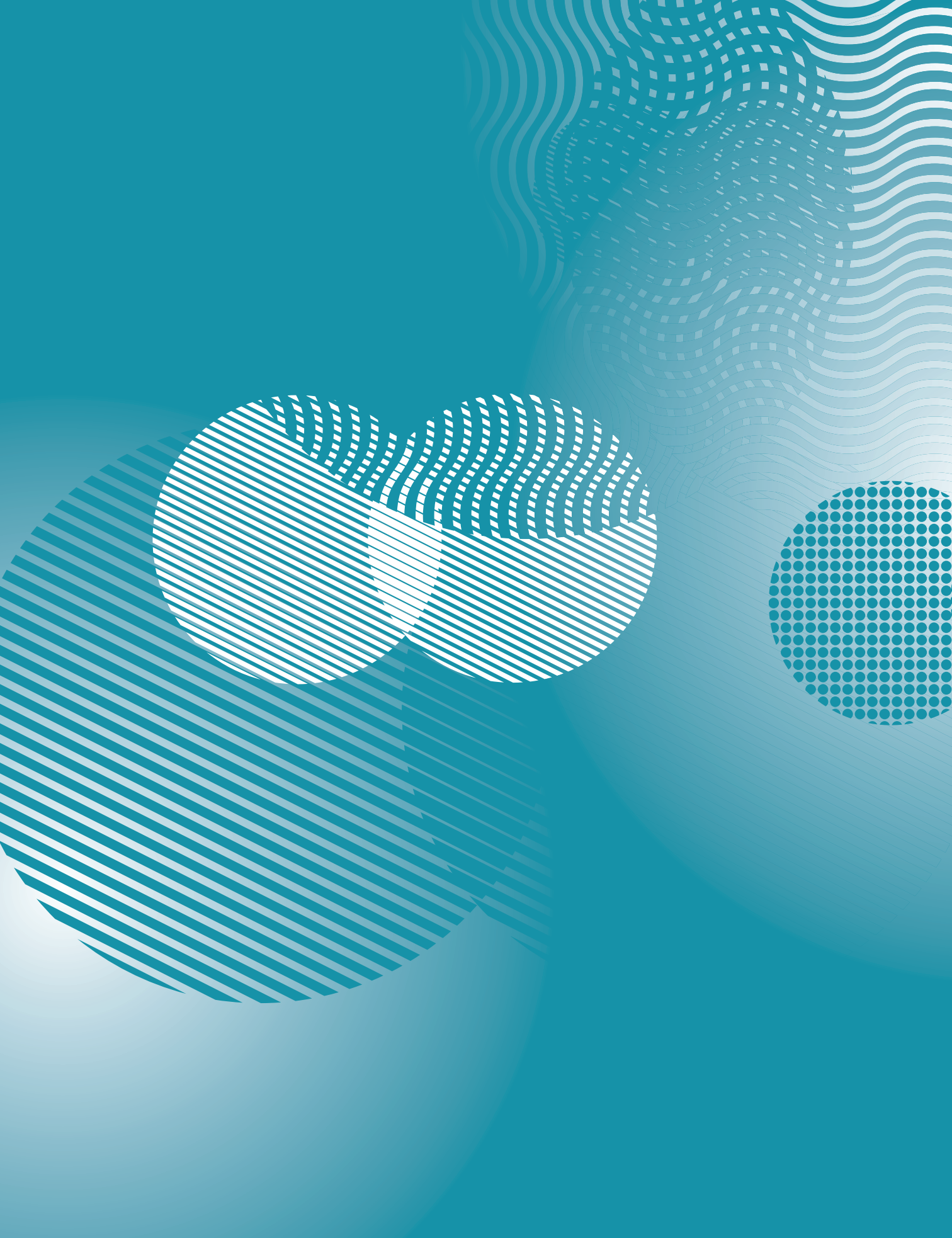


INTRODUCTION

Development of the world economy over the last thirty years has been characterized by extensive deregulation of markets – particularly financial and currency markets – in rich and poor countries alike, the attrition of the public realm, and the extension of profit-making opportunities to an ever-widening range of spheres, among which not only economic, but also social, cultural and political life. It has been described as a period of "hyperglobalization" (UNCTAD, 2017, p.21).

Hyperglobalization has resulted in a massive shift in power that benefited capital over labour. It also led to asymmetries between increasingly more concentrated and powerful transnational units operating through international trade and finance, and ever weaker governments in most countries. Other features of globalization include financialization of the economy, increasing inequalities, high market concentration, rentierism, and ever-growing indebtedness, among others.

While the Global Financial Crisis (GFC) of 2008-2009 to a certain extent slowed this process of hyperglobalization, it did not reverse any of these trends. As governments bailed-out private investors with taxpayers' money and adopted fiscal austerity, further undermining social policies meant to help the most vulnerable, they continued with "business as usual". In response, growing popular frustration with the political and technocratic elite has resulted in a backlash against the establishment, as well as against hyperglobalization. More recently, a sense of anxiety has given way to contestation in various forms and at various levels, ranging from Brexit, the "yellow vests" in France, through the "trade wars", to the School Strike movement for climate action, to name a few.

The international community has responded to the challenges posed by hyperglobalization by proposing an ambitious vision for the future in the form of the 2030 Agenda for Sustainable Development (the 2030 Agenda). The United Nations Member States pledged to ensure sustainable and inclusive economic growth, elimination of extreme poverty, reduction of inequalities, and environmental protection. The Agenda is intended to be

the most comprehensive and ambitious project in history and is universally applicable.

The issue of fostering inclusive growth is relevant for the Eurasian Economic Union (EAEU) Member States (the Republic of Armenia, the Republic of Belarus, the Republic of Kazakhstan, the Kyrgyz Republic, and the Russian Federation). In accordance with Article 4 of the Treaty on the Eurasian Economic Union, one of the main objectives of the Union is to create conditions for stable economic development of the Member States so as to improve the living standards of the population. It places additional responsibility on regulatory bodies of the EAEU Member States towards all the citizens of each country, since the commitment to implement long-term scenarios of the EAEU economic development should not lead to deterioration in the current quality of life. In addition, the external economic environment has been generally unfavorable for the EAEU Member States in recent years. Therefore, there has been a need to create a fuller picture of the challenges facing the population in the context of global economy turbulence and aggravation of internal problems in the course of development and implementation of integration measures and actions.

The core proposition of the 2030 Agenda is that social advancement cannot be accomplished without economic progress and environment protection. Unlike the Millennium Development Goals, which focused primarily on social targets, the 2030 Agenda has rightly emphasized the development of productive capacity as the basis for achieving the other goals. A part of this shift in emphasis towards economic and environmental issues, the notion of inclusive growth has received a prominent place in the 2030 Agenda.

The matters of inclusive and sustainable growth are encapsulated in Sustainable Development Goal № 8, which has the ambition of "promoting sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all".

Moreover, target 17.19 in the 2030 Agenda states: "by 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement GDP, and support statistical capacity building in developing countries". This reflects a burgeoning movement for a better measurement of progress than GDP, which has, for instance, resulted in the call by the Stiglitz – Sen – Fitoussi 2010 Report, commissioned by the then President of France, Nicolas Sarkozy, to find a better measure of economic performance and social progress. The work in this study contributes to these sustainable development goals and targets and to the wider debate on how inclusive growth might be measured.

The EAEU Member States are fully aware of these issues. During the plenary session of the Astana Economic Forum 2017, the then President of the Republic of Kazakhstan, Nursultan Nazarbayev, noted:

> *"GDP does not reflect the long-term nature of economic activity, does not consider the damage caused to the environment, including depletion of natural resources. Moreover, it does not reflect the quality of life in a country. GDP per capita does not reflect the real well-being of citizens, nor does it consider the income inequalities.*

I believe that the world community should adopt an updated method of calculating GDP on the basis of "green" GDP and such indicators as the Human Development Index and the OECD Better Life Index. The calculation method should adequately reflect the need for a balanced development of countries".

Consequently, there seems to be a global search for more comprehensive approaches, starting from the premise that an improvement in the quality of life of a country's population is the ultimate goal of any economic policy and should be its main assessment criterion at the macro level. While there has been no agreement on how to define or measure "quality of life" yet, there appears to be an emerging consensus that any assessment should be represented either in the form of a dashboard of well-defined indicators or of a composite index calculated on the basis of those.

The conceptualization of the elements determining quality of life has more recently been based on the inclusion principle. In a broad sense, inclusion is an incorporation of all elements of a system into a process. From the perspective of economic theory, it refers to the non-discriminatory participation of each and every individual in social and economic processes. Consequently, the term "inclusive development" describes economic development taking into account the inclusion principle. However, the term "inclusive growth", which is mostly used as a synonym for "inclusive development", has been more widely used.

Against this background, the Eurasian Economic Commission (EEC) and the United Nations Conference on Trade and Development (UNCTAD) have joined forces to contribute to the debate on inclusive growth. While the EAEU Member States gave a commitment to achieve the objectives of the Treaty on the EAEU and the United Nations Sustainable Development Goals (including Goal № 8), they have not, as yet, examined the issues related to inclusive growth in a comprehensive manner.

This report is intended as a first contribution to the debate on the concept of inclusive growth and the instruments to measure it (section 2), and proposes one possible methodology (section 3). This work lays the foundation for a comparative analysis of the inclusive economic growth in the EAEU Member States (section 4). In this vein, the study should assist policymakers in identifying options for EAEU Member States on how to adopt an inclusive growth path the most efficiently.

Importantly, this study should be considered a work-in-progress as it is the first of its kind for the EAEU Member States and globally there is no precisely developed concept and methodology to measure inclusive growth in countries. Nevertheless, both UNCTAD and EEC are convinced that this report presents some important findings that will help the EAEU Member States to implement economic, social and environmental policy measures that will improve the living standards of their population.

1 INCLUSIVE GROWTH: SOME CONCEPTUAL ISSUES

1.a The 2030 Agenda and the SDG 8

In the post-war period, the prevailing view in economics was that economic growth and inequality followed the inverted U-curve formulated by Kuznets (1955). In other words, inequality was low in slowly growing traditional, agricultural economies, before starting to increase in a more dynamic phase, when developing countries started a catching-up process, and then again became low in more mature, developed economies experiencing slower growth. In essence, increasing inequality was seen as a price to be paid for modernization and for higher economic growth. However, the expected end result was a modern economy with a low level of inequality. Short term pain for long term gain.

Radical changes in economic policies during the neoliberal reforms of the 1980s and 1990s, however, started to render this "empirical regularity" moot. In particular, inequality started to increase in developed economies as well, while in developing countries there were differing paths of economic development, ranging from high inequality and low growth (mostly Latin American countries) to high growth and low inequality (some East Asian countries). As a result, a new line of thinking in economic theory has emerged, arguing that equity and growth are complementary (Lustig et al., 2002; Birdsall & Szekely, 2003). Instead of focusing solely on inequality of outcomes (income and wealth), this approach also examined inequality of opportunities. Initial inequalities in opportunities due to structural reasons, for example, in education, tend to be amplified later in life through different channels depending on the specific mixture of institutions, policies, and power relations in a certain society. These inequalities affect investment and innovation possibilities of the poorer part of the society, and therefore restrict economic growth at a national level. Thus, if the achievement of GDP growth is the ambition, inequality is hardly a price to be paid but rather a constraint.

Until not long ago, the issue of inequality has been a marginal subject in economic theory. Only recently has it become more prominent. UNCTAD's annual Trade and Development Report anticipated current debates on growth and inequality by at least a decade. The 1997 edition was subtitled "Globalization, Distribution and Growth". Later the World Bank, the IMF and the OECD also took up the banner of inclusive growth. The debates on these topics in academic circles received wider attention with the general public as the Global Financial Crisis erupted in 2008-2009. Two books that strongly popularised the topic were "The Price of Inequality" (Stiglitz, 2012) and "Capital in the Twenty-First Century" (Piketty, 2014).

The concept of inclusive growth is not without controversy, however. The neoliberal understanding of inclusive growth is based on the notion that some individuals, communities, or even countries have been excluded from the processes of hyperglobalization and the opportunities offered by them. If that is the diagnosis, then the cure is simple: more markets, more liberalization and deregulation, and less state intervention. In other words, if policymakers adopt structural reforms advocated by the Bretton Woods institutions, everybody will enjoy the benefits of hyperglobalization. Indeed, according to the words of Pier Carlo Padoan, Deputy Secretary-General and Chief Economist at the OECD, and Mahmoud Mohieldin, Managing Director of the World Bank, "structural reforms can do much to unleash opportunities for investment and to allow countries to tap new sources of growth. They can also address issues of inclusiveness and social cohesion, ensuring that the benefits of sustained growth are shared equitably."[1]

This diagnosis, however, overlooks a central point, namely that many of those who are on the losing end of hyperglobalization have not been excluded, but rather are deeply embedded in it[2]. They have been integrated into these processes, but at the same time have been excluded from the accruing benefits. One of the most obvious examples is the so-called "working poor". This term denotes individuals who despite having a steady job live below the poverty line. Thus, it cannot be claimed that they are excluded from hyperglobalization and that they should somehow be "included". Data from ILO (2019) show that the total number of working poor in low- and middle-income countries was around 700 million in 2018. In other words, one in four persons in employment lives in conditions of poverty in these countries.

One area where neoliberal "inclusion" is especially detrimental is financial inclusion of the poor through microfinance. While microfinance has been hailed as the best way to turn poor into entrepreneurs, a more critical assessment shows that the results are very different from the intensions. Neoliberal forms of financial inclusion allow financial institutions to identify new client populations to be targeted, and value can be extracted from them, no matter what the eventual consequences for the wider population. The extent of dividend and interest payment channelled from the poorest communities up to the rich elites is simply massive due to interest rates, which are usually in double digits. Thus, microfinance mostly serves to perpetuate inequality instead of providing the poor with means to benefit from hyperglobalization[3].

Of special significance for the understanding of inclusive growth is the relationship between inequality and growth. Statistics shows, for example, that from 1980 to 2016, the top one percent of the world income distribution captured 27 percent of the real income growth in the world economy. At the same time, the bottom 50 percent accounted for only 12 percent of total real income growth. Similarly, the wealth of the world's billionaires increased by USD 900bn in 2018, or USD 2.5bn a day, while the wealth of the poorer half of humanity, 3.8 billion people, fell by 11% (Oxfam, 2019). These numbers show that the benefits of economic growth are not shared evenly among people in our societies, and that profound inequalities are a systemic feature of hyperglobalization, not an aberration.

An alternative to the neoliberal understanding of inclusive growth is to see poverty and inequality as crucial and integral parts of hyperglobalization. A process where labour markets get more flexible but more precarious and jobs are low paid, while simultaneously corporations enjoy large profits, is the norm rather than the exception. Fiscal austerity, which reduces public services and social protection, is closely related to the fact that corporations and high net worth individuals are hiding, on a large scale, their profits and wealth in tax havens. Rising indebtedness of the poorer segments of society and bailing out the "too big to fail" financial institutions engaged in risky lending and investment practices are an intrinsic part of hyperglobalization, and not something alien. High market concentration and near-monopoly power in many market segments, coupled with rentier strategies, is another consequence of deregulation and liberalization processes over the last four decades.

The policy implications of these two views on inclusive growth are very different. From the neoliberal point of view, policymakers must ensure that structural reforms are implemented, that impediments to free markets are removed, and that all players are properly equipped to participate. According to the alternative view, however, the prescriptions advocated by the neoliberal viewpoint will only aggravate the problems of inequality. The policy challenge, instead, is to change the rules of the game. This would entail rebalancing development with goals such as a productive global economy built around full and decent employment at liveable wages; a just society aiming to close socio-economic gaps, within and across nations, generations, households, gender and race; a caring community that protects vulnerable populations and promotes economic rights, and the like.[4]

However, translating this alternative view of inclusive growth into a measurable concept is not an easy task. Information on whether the change is being brought about and we are moving in the right direction cannot be easily captured by one indicator. The challenge presented by inclusive growth is that it is a multifaceted phenomenon, the main characteristics of which are not easily presented in statistical form.

The 2030 Agenda has also had to deal with this problem. Looking at SDG 8, it is comprised of three groups of targets. The first group entails economic targets, namely economic growth, productivity, job creation, access to finance, and Aid for Trade. The second group comprises social targets such

as full and productive employment and decent work, youth employment, labour rights and fight against forced and child labour. The third group includes targets related to environment such as resource efficiency and decoupling growth from environmental degradation, and sustainable tourism. Unless all of these elements can somehow be combined into a single indicator, SDG 8 must be represented by a dashboard of indicators.

While no one individual SDG target captures the "alternative" view of inclusive growth, it can be argued that the SDGs in their totality approximate it quite well. SDG 8 captures full employment and decent work; SDG 16 (peace, justice and strong institutions) aims at building just societies; SDG 10 (reduced inequalities) addresses closing socio-economic gaps within and across nations, generations and households; SDG 5 (gender equality) aims to reduce gaps between men and women; SDG 1 (poverty reduction) and SDG 2 (food security) are goals of building a caring community that protects vulnerable population groups. Thus, linkages between SDG 8 and other SDGs are multiple and very strong and taken together point to a more holistic view of inclusive growth.

It is only by looking at the 2030 Agenda as a whole that one can comprehend its radical nature. In its 17 goals, the Agenda aims to achieve a radically better world, one that departs decisively from the "business as usual". At its core, therefore, the aim of the 2030 Agenda goes beyond embedding in hyperglobalization those who have been excluded or somehow "left behind" and has the ambition to change the rules of the game itself and to build societies that are more equitable, more caring and more in tune with nature.

1.b What, if anything, will replace GDP?

The growth in real Gross Domestic Product (GDP) and its derivatives has for a long time been the primary approach for evaluating a country's economic performance and the success of its macroeconomic policy. But recently the switch in dominance from manufacturing to services, from analog to digital, all accompanied a growing recognition that any measure of economic performance should take account of what are today termed "regrettables" e.g. degradation of environment, high policing or military costs or time lost to commuting. In short, the growing appreciation of the interconnections between economic, political, social, environmental and cultural spheres in the public consciousness has contributed to the realization that GDP may not be the optimal measure of progress. Hence the search by economists for an alternative or complement to GDP.

This realization has coincided with a proliferation of attempts to go beyond GDP as the main, or at least the most important, measure of macroeconomic progress. These attempts have been present in academia for a long time (for example, Kuznets, 1962), but have in the last two decades moved on to the agenda of international organizations (e.g. Human Development Index of the United Nations Development Programme), as well as to some national-level initiatives (Bhutan's Gross National Happiness, for

example). Opinions such as the one expressed by Nobel laureate. Joseph Stiglitz, at the World Economic Forum in Davos in 2016 are becoming increasingly widespread:

> *"GDP is a poor well-being indicator, and it is important to understand that the use of such indicators influences certain decisions. What is the point in increasing GDP if the planet is so polluted that our lives are in danger?"*

Abandoning the idea of prioritizing GDP is also evidenced by an increasing number of practical examples that cast doubt on sufficient informational value of GDP and its derivatives. In particular, there are many countries that have enjoyed positive GDP growth rates for decades (for example, annual GDP growth rate in Colombia was negative only once over the last 55 years) but simultaneously faced a variety of challenges, such as, risk of economic and political destabilization or poor working and living conditions.

The debate on the usefulness of GDP as a measure of economic progress cannot be seen in isolation from broader discussions both in economic and social theory. As the dominant, mainstream narrative in economic theory has difficulties explaining the highly unequal outcomes in the world where markets have been more and more deregulated, or where the Global Financial Crisis appears as a unicorn (a once-in-one-hundred-years event), the time is ripe to search for alternative narratives. In the same vein, the failure of mainstream economics to explain climate change has led to a critical rethinking of some of the basic premises of neoliberal discourse. Thus, the means to measure economic progress is not only a technical, statistical issue, it is political to the core as it places a much broader set of issues on the agenda, including welfare, inequality, quality of living, happiness and many others.

Following the Great Depression of the 1930s and the onset of World War II, GDP emerged from these crises and the 1944 Bretton Woods conference as the preeminent economic indicator (Dickinson, 2011; Fioramonti, 2013) and the ultimate measure of a country's overall welfare. Described by Samuelson and Nordhaus as one of the greatest inventions of the 20th century, as Philipsen (2015, p. 237) notes "GDP is not just a measure of the economy. It defines the economy". Although a purely economic measure, GDP has frequently been used as a proxy measure for welfare. Palmer in 1966 described GDP as the "chief criterion for national welfare or progress." Steve Landefeld, Director of the United States Bureau of Economic Analysis, in 2010 similarly noted the "singular focus on GDP alone as a measure of society's welfare" (Bureau of Economic Analysis, 2010).

However, from the outset, Simon Kuznets, the economist most commonly associated with the creation of GDP, cautioned that GDP could unwittingly act as a "statistical laundry" concealing inequality and would be an unreliable or inappropriate measure of well-being, noting "the welfare of a nation can scarcely be inferred from a measure of national income" (Kuznets, 1962, p. 29). Stiglitz (2014) went further, saying that not only is GDP a poor measure of welfare, but "GDP is not a good measure of how well an economy is performing" and that "too much has already been sacrificed on the altar of GDP fetishism". The Irish 2014–15 real GDP figures of 26.3

percent, published in July 2016, serve as a good example (MacFeely, 2017). Following these explosive figures, Deen & Doyle (2016) noted that standard national accounting methodology is "not fit for purpose as an indicator of economic growth." The OECD (2016) also stated that "The Irish figures help to illustrate the limits of GDP and in particular the care needed in its interpretation, particularly in the domain of material well-being. It also highlights the importance of focusing on additional aggregates including those defined within the system of national accounts, and not exclusively on GDP." It has also been argued that GDP is an out-of-date concept, "a relic of a period dominated by manufacturing" (The Economist 2016, p. 22) struggling to capture the impact of myriad intangible innovations. Nevertheless, as Talberth et al. (2007, p. 1) note, "GDP maintains its prominent role as a catchall for our collective wellbeing".

Since the 1970s, there have been many attempts to challenge the primacy of GDP as the definitive measure of progress, such as: the Measure of Economic Welfare (MEW); the Total Incomes System of Accounts (TISA) or the Index of Sustainable Economic Welfare (ISEW), which was later renamed the Genuine Progress Index (GPI), and the Human Development Index (HDI); and perhaps most famously, the unfortunately titled Gross National Happiness (GNH) proposed by the King of Bhutan. The essence or spirit of these alternatives was perhaps best encapsulated by Robert F. Kennedy's reference to GDP during a 1968 campaign speech in the University of Kansas: "it measures everything in short, except that which makes life worthwhile" (Kennedy, 1968).

Considering the circumstances in which GDP achieved dominance, it is ironic that it was another economic crisis, namely the Global Financial Crisis of 2008-2009, that has reinvigorated attempts to develop a more wide-ranging measure of progress. The Commission on the Measurement of Economic Performance and Social Progress (better known as the Stiglitz-Sen-Fitoussi Commission) was established by the then president of France, Nicolas Sarkozy, in 2008, to determine whether a better or more comprehensive measure of economic and social progress could be established (see Stiglitz et al., 2010). In 2009, the European Commission published their roadmap "Beyond GDP", which is an amalgam of "enlarged GDP", social and environmental indicators and other measures of well-being. In the United States, the Obama administration formally established the Key National Indicators Commission in 2010 to develop a comprehensive indicator system (KNIS), which comprises over 300 key and twelve composite indicators. The following year the OECD launched their "Better Life Index" (BLI) to address similar questions.

The then UN Secretary-General Ban Ki-Moon, speaking at a High-Level meeting on "Happiness and Well-being: Defining a New Economic Paradigm" in 2012, noted the importance of establishing "a Sustainable Development Index, or a set of indicators to measure progress towards sustainable development" (United Nations, 2012). The United Nations University's International Human Dimensions Programme on Global Environmental Change (UNU-IHDP) in collaboration with the United Nations Environment Programme (UNEP) has also developed an Inclusive Wealth Index (IWI). All of these indicators

– Beyond GDP, the KNIS, the BLI, the SDI, and the IWI – have adopted a dashboard approach rather than tried to develop a single aggregate index. This reflects the complexity of capturing inclusive growth and illustrates the communications and branding challenge ahead. It also reflects the wider scope of issues that now are included under the "progress" umbrella: environmental sustainability; economic stability and sustainability; and social goals such as health, satisfaction, and general well-being.

From a cultural perspective, GDP enjoys a celebrity status that transcends the number itself. At some superficial level, it is one of the most recognised terms or concepts in the world, yet few really understand what it means (MacFeely, 2016). It is therefore the challenge for official statistics to supplement GDP, a number with considerable cultural authority and standing, with another number or index that is complex enough to incorporate resource depletion, environmental degradation, well-being, social inequality, and economic performance, but is simple enough to be accepted.

The abundance of rival indicators that have arisen in recent years to challenge the hegemony of GDP poses an additional problem for official statistics and potentially risks losing credibility. Ironically, the glut of alternatives developed to supplement GDP has only led to confusion, perversely cementing, at least for the time being, the dominant position enjoyed by GDP. So, while many of these new indicators may in fact represent real progress in the right direction, their sheer number can also be viewed as a metric of failure.

The 2030 Agenda explicitly calls for the development of "measurements of progress on sustainable development that complement GDP" (Goal 17.19), but it is noteworthy that the indicator framework agreed at the 47th United Nations Statistical Commission in March 2016 did not propose any indicators addressing this issue (United Nations Statistical Commission, 2016). "Perhaps this is because there has been little consensus on a suitable replacement. Perhaps, more fundamentally, it is that there is even less consensus on how well being should really be measured and if quantitative measurements can be made at all" (Talberth et al., ibid). Thus, finding an indicator (or a limited set of agreed indicators) that is not so simple to ignore the negative externalities of production but not so complex to be incomprehensible to users is a high-wire act. Whatever measure or measures are selected, they must be sufficiently authoritative and scientific to complement GDP. This probably means moving away from terms like "happiness", which do not translate well from Eastern culture and lead many to misunderstand the concept being proposed.

Therefore, we are in an interregnum period where it is now accepted that the old metric is not suitable for the purposes to which it is being used, but a suitable alternative has not yet been found. Capturing economic progress in one indicator may never be possible due to complexities involved. In spite of that, we must continue to search for indicators that better describe the nature of our economic progress and indicate the real costs or trade-offs involved in making that progress.

1.c Examining the practice of international organizations

The difficulty of capturing the essence of inclusive growth, coupled with the technical complexity of that task, is evident from the many attempts of international organizations. As can be seen in the short and non-exhaustive summary that follows, each of them is emphasising a particular aspect of inclusive growth, while leaving others unattended. A dashboard approach is preferred by some international organizations, whereas others have opted for a composite index. Either approach has pros and cons.

1.c.1 Asian Development Bank

Increasing economic inclusion in the Asian region is one of the goals set out in the Asian Development Bank (ADB) Strategy 2020. In a broad sense, the ADB defines inclusive growth as economic growth that does not only create new opportunities in the economy, but also ensures equal access to those for all population groups (especially the poorest ones). In a narrow sense, according to the ADB, growth is considered inclusive if, firstly, incomes of all population groups increase due to their economic "participation", and secondly, "non-monetary" (related to education, healthcare, social inclusion, etc.) disparities among various population groups decline. Therefore, the ADB focuses equally on both outcomes and the process of growth.

The ADB uses 35 indicators splitted into 8 groups to assess the economic situation in terms of inclusion:

- Poverty and inequality
- Economic growth and employment
- Key infrastructure endowments
- Access and inputs to education and health
- Access to basic infrastructure utilities and services
- Gender equality and opportunity
- Social safety nets

At the same time, the ADB does not examine economic policy for promoting inclusive growth in detail, but outlines its main pillars:

a) fostering high, efficient, and sustained growth to create productive jobs and economic opportunity;
b) investing in education, health, other social services to expand human capacity and eliminating market and institutional failures and social exclusion to level the playing field;
c) establishing social safety nets to protect the chronically poor and to mitigate the risks of transitory livelihood shocks.

1.c.2 European Commission

Achieving inclusive growth is set as one of three priorities of the European Union development strategy "Europe 2020", According to the European Commission approach, inclusive growth is achieved through provision of high employment rates, investment in acquisition of necessary skills, fighting poverty and modernizing labour market so that the population would be able

to forecast and adapt to various changes, thus forming a cohesive society. Additionally, an indispensable prerequisite for achieving inclusive growth is the expansion of positive effects of economic growth across all the EU regions, including the most remote ones, which promotes equalization of the quality of life throughout the European Union.

Assessment of the current economic situation in terms of its compliance with inclusion principles within the framework of the strategy is carried out by the means of five key indicators[5]. However, 21 inclusion indicators are additionally used in expanded reports beyond the scope of the strategy. It should be noted that the European Commission analyzes the situation both across the EU in general and in the EU Member States.

The strategy also includes the lists of key measures to achieve inclusive growth in two main areas: "Acquisition of new skills and increase in employment rates" and "Poverty reduction". Each list of measures is split into two groups: measures taken by the European Commission at the supranational level and those adopted by the EU Member States at the national level. Approaches to analysis and assessment of the economic policy in terms of inclusion have not yet been developed by the European Commission.

1.c.3 Organization for Economic Cooperation and Development

The Organization for Economic Cooperation and Development (OECD) defines inclusive growth as the enhancement of multidimensional living standards of a representative (median) household calculated as the change in real disposable income adjusted for variations in living standards.

A three-stage process is employed. At the first stage, monetary component of living standards, i.e. real disposable income, is determined for each household[6]. At the second stage, "monetization" of non-monetary aspects of living standards is performed ("equivalent income method" is implemented). According to the OECD, such aspects include unemployment rate and life expectancy. "Monetization" is the detection of a change in the hypothetical disposable income volume that can be estimated by a household as an equivalent to changes in other (non-monetary) aspects of life. Finally, these two derived results are aggregated to determine the changes in multidimensional living standards. Change in multidimensional living standards of a representative (median) household of the country is calculated using the generalized mean method.

This approach is practice-oriented as deterioration in the spheres of employment and life expectancy accompanying positive changes in real disposable income can be taken into account. Therefore, this approach can provide a rationale for the amount of social benefits received by a particular population group.

On the other hand, the OECD has not so far completed methodological work that would allow an extension of the list of "non-monetary" aspects included in living standards, such as, for example, the quality of education. Furthermore, this approach is complicated (time-consuming) as it involves carrying out special sociological surveys.

Furthermore, the OECD has defined criteria that help to define economic policies that promote inclusive growth. According to this approach, to achieve inclusive growth, economic policy strategies should address a number of tasks, including:

Group 1 "Creating opportunities for improving the well-being and prosperity of the population"

- Pursuing educational policy that promotes acquisition of knowledge and skills and ensures these skills remain in demand on the labour market throughout people's lives
- Creating equal opportunities in the healthcare sector
- Taking fiscal measures to support the most vulnerable population groups in certain phases of economic cycles
- Promoting adaptation of the population to changes in the labour market
- Reducing gender disparity in the labour market and increasing female participation in economic activities
- Preventing inequality among pensioners.

Group 2 "Ensuring equal opportunities for business"

- Promoting business dynamism
- Eliminating jobs and skills mismatches to boost productivity growth
- Incentivizing research and development
- Supporting access of small and medium-sized enterprises to financing
- Promoting equitable financial markets
- Maintaining the balance between promoting business dynamism and taking actions to mitigate trade-offs.

Group 3 "Public governance"

- Promoting equitable development of regions, cities and neighbourhoods
- Ensuring direct interconnection between mechanisms of forecasting, stimulation and implementation of economic policy measures
- Expanding international cooperation and strengthening the role of global governance institutions
- Designing country-led inclusive growth policy strategies.

1.c.4 United Nations Development Programme

The United Nations Development Programme (UNDP) attaches great importance to inclusion in the context of Sustainable Development Goals achievement. However, no unified inclusive growth concept has been developed within its framework. The UNDP Regional Offices conduct analyses of inclusive growth in selected countries and regions, formulating the concept of inclusion and defining the approach to its analysis based on the specific development features and economic structures of a particular country. For example, the report on inclusive growth in India focuses on the issues of providing equal opportunities for various ethnic and confessional groups. Reports on inclusive growth in African countries generally examine disparities in quality of life between rural and urban populations.

1.c.5 The World Bank

Within the framework of its own inclusive growth concept, the World Bank simultaneously focuses on economic growth rates and the long-term prospects of economic growth, paying due attention to the interconnectedness of micro- and macro- economic growth determinants. The approach stipulates that economic growth can be considered inclusive if along with the real GDP growth the following improvements are observed:

- An increase in productive employment (i.e. increase in both employment and labour productivity);
- Contributors to economic growth comprise various population groups and several sectors of the economy (i.e. economy diversification is under way);
- Non-discriminatory access to markets and resources is being facilitated for persons and legal entities;
- A more fair regulatory environment;
- Main economic growth sources are provided via market economy system, while the role of government is limited to supportive;
- Real economic growth rather than just income redistribution among population groups to alleviate poverty;
- Growth rates are sustainable in the long run.

Yet, it has not been in many countries that the World Bank has conducted research on inclusive growth. Moreover, the World Bank has not defined approaches to economic policy analysis in terms of inclusive growth.

1.c.6 World Economic Forum

To form the concept of inclusive growth the World Economic Forum (WEF) refers to the concepts of "top-level economic policy results" and "bottomline-level economic policy results". The former is represented by real GDP growth, whereas the latter is considered as improvements in quality of life. According to the WEF, inclusive growth is the strategy of strengthening direct interconnections between the top and bottomline level economic policy outcomes, which implies improvement in the well-being and provision of better opportunities for everyone. The strategy is primarily implemented by means of institutional development.

The WEF calculates an inclusive development index that assesses the current economic situation in terms of its compliance with the inclusion principles. The inclusive development index is a composite index calculated on the basis of 12 indicators equally distributed among three parameters: growth, inclusion and sustainability. The inclusive development index is a relative indicator that cannot be interpreted without comparative analysis.

In addition, the WEF analyzes each country's economic policy in 7 key areas to assess future prospects for inclusive growth. These are: education and professional skills, basic services and infrastructure, absence of corruption and cost of rents, financial intermediation of real economy investment, asset-building and entrepreneurship, employment and labour compensation, fiscal transfers.

Actions taken in each area in terms of fostering inclusive growth are also subject to quantitative evaluation against a defined set of indicators. The assessment methodology is similar to that employed for the inclusive development index (assignment of ranks based on indicator values and calculation of a simple arithmetic mean of the assigned ranks). According to the WEF, these indicators identify an economy's ability to provide synergy between growth and inclusion.

Reviewing the concepts used by international organizations to measure inclusive growth, three approaches or adjustments differentiating them from GDP are evident.

Firstly, from an economic perspective, the notion of inclusive growth complements GDP with indicators on employment, labour productivity and trade.

Secondly, existing approaches typically associate inclusive growth with the elements of quality of life and living conditions. These often equate with issues, such as, health, ecological environment, education, access to essential services, safety and infrastructure, as well as financial inclusion[7].

Thirdly, in order to measure and understand inclusive growth, the impact on inequality must be taken into consideration. Although inequality is often synonymous with income inequality (and typically measured by a Gini index[8]), in fact, inequality is broader than income and could also address health and social issues, rights and obligations, discrimination by race, sex or religion, access to technologies and information, opportunities and participation, empowerment in society as well as exposure to environmental or climate effects etc (UNCTAD, 2019).

Summarizing the concepts used by international organizations, the EEC defines "inclusive growth" as the *convergence in the quality of life of all population groups within a country, achieved not only through the governmental redistribution of economic performance outcomes, but also through the creation of favorable, non-discriminatory economic conditions, that allow each population group to achieve self-sufficiently quality of life comparable to other groups and contributing to the improved quality of life of the entire population.*

Although there has been considerable research into both intra-regional economic growth inclusiveness and global economic policy assessment, to the best of our knowledge, a comprehensive consideration of the three dimensions of inclusiveness noted above has not yet been fully taken into account. A clearer understanding of the progress being made by countries towards achieving inclusive economic growth could contribute to programs, such as, the UN Sustainable Development Goals, by helping to identify national priorities for inclusive growth. Therefore, construction of an extensive integrated index applicable to all the countries across the globe remains a worthwhile research avenue.

Table 1. Main provisions of the international organizations inclusive growth concepts

Main provisions of the international organizations inclusive growth concepts			
Organization	**Definition of inclusive growth**	**Approach to analysis**	**Economic policy fostering inclusive growth**
ADB	Increase in incomes through "participation", and simultaneous decline in inequalities as defined by "non-monetary" aspects of quality of life.	Analysis of indicators combined into 7 groups without calculation of a composite index.	Economic policy priorities have been identified: creating new opportunities in various spheres; ensuring equal access opportunities; and establishing social safety nets for all population groups. No integrated approach to elaboration and implementation of economic policy has been developed.
EC	Support to achieve high employment rates, investing in acquisition of necessary skills, fighting poverty and modernizing labor markets.	Analysis of indicators combined into 5 groups without calculation of a composite index.	No integrated approach for elaboration and implementation of economic policy has been developed.
OECD	Improvement of multidimensional living standards of a representative (median) household.	Calculation of a composite index.	Economic policy should be aimed at addressing three tasks: "Creating opportunities for improving the well-being and prosperity of the population"; "Providing equal opportunities for business"; and "Public governance".
UNDP	No unified concept has been developed.	Inclusive growth is examined individually for each country based on its specific characteristics.	Economic policy is developed individually for each country with respect to its specific characteristics.
WB	Real GDP growth along with the fulfilment of five supporting conditions.	No integrated approach to assessment in terms of inclusion has been developed.	No integrated approach for elaboration and implementation of economic policy has been developed.
WEF	Translation of real GDP increase into improvement of quality of life through creation of relevant opportunities.	Calculation of a composite index using grouped indicators characterizing three parameters: growth, inclusion and sustainability.	Measures should be taken in 7 key areas: education and professional skills; basic services and infrastructure; financial intermediation for real economy investment; asset-building and entrepreneurship; employment and wages; and budget transfers. Economic policy is assessed with a composite index based on grouped indicators characterizing the 7 areas.

2 METHODOLOGY AND INDICATORS FOR THE EAEU MEMBER STATES

2.a General concept

The proposed inclusive growth index attempts to strike a balance between:

- maximizing the number of countries included in the analyses;
- ensuring a comprehensive versatile assessment of various aspects of inclusiveness, including those identified by research undertaken by international organizations.

In particular, the first objective imposed restrictions on the range of variables that could be used owing to limitations of data availability.

In order to tackle data gaps for important indicators, data imputation procedures were performed (which is outlined in Section 2b).

The EEC adopted a composite index approach. The structure of the composite index reflects inclusive growth as defined by three pillars: Economy; Living conditions; and Inequality. These pillars are comprised of indicators chosen to leverage the notion of inclusiveness implied by each of the pillars (see table 2). A case in point, not only does the economic aspect of the index include GDP-related indicators, but it also takes into account the peculiarities of labour market, external trade etc. In the same vein, the index views living conditions from the perspectives of ecology, access to education, health, logistics, financial and telecommunication services. Correspondingly, inequality is measured by identifying discrepancies in income, access to the labour market and decision-making process.

Attributing weights to indicators within pillars and between the three pillars of the composite index, can be typically done in one of three ways:

- weights are set to equality – effectively meaning the index is unweighted;
- weights are assigned based on experts' estimations;
- weights are determined using statistical instruments or techniques (European Commission, n.d.).

Opinions on which approach is the best vary. However, determining weights using the third approach has two advantages:

- using statistical techniques can help to scientifically identify and quantify underlying interconnections implied in the original data;
- it reduces the risk of bias associated with experts' view or particular ideology.

One of the most widely recognized statistical techniques used to calculate index component weights is principal component analysis (PCA). This methodology distills multicorrelated input indicators to form new variables referred to as principal components (PCs), which account for shares of the original data variance, while being independent. Each PC is then attributed a weight corresponding to the share of variance explained. For more information on the methodology for assigning weights to indicators, components and pillars, see Sections 2c and 2d; to find more details on the PCA methodology, please, refer to Annex I.

In this fashion, PCA makes it possible to assign weights to components and, thus, indicators that account for the greatest share of the dataset variance and, correspondingly, appear to be the most important causes of disparities in inclusive economic growth. The World Bank household consumption, wealth and living standards indices are all examples of where this PCA approach is used (n.d.a; n.d.b).

Critics of this approach argue that the results are difficult to interpret and that the weights can be unstable (Nasdaq, 2010). It has been argued that the PCA approach can suffer from considerable year-on-year fluctuations (Abeyasekera, 2003). This problem may arise if inclusive economic growth undergoes dramatic year-on-year changes. Finally, the index ranks countries from the perspective of overall inclusive growth and changes within each of the pillars, rather than from the evolution of the indicators themselves. The components should not therefore be considered as independent information scores, but as an auxiliary instrument applied to calculate rankings within the pillars.

The same discourse is applicable as far as the weights for the pillars are concerned. The PCA approach can be extended to weighting the composite index calculation.

To summarize, the index is derived from the pillars; the pillars represent the weighted average of the PC scores; the principal components are calculated as linear combinations of the original indicators. A summary of the architecture adopted is represented in Table 2.

In line with the methodology outlined above, the necessary data were assembled. Thereafter, the variables were converted into standard comparable units, to eliminate biases arising from different scales. Each variable was standardized to have a mean of 0 and a standard deviation of 1, and if necessary was inverted so that larger values refer to better results. For the detailed explanation on the sources and peculiarities of each of the indicators used, see Annex II.

Table 2. The index architecture*

Composite Index of Inclusive Growth					
	Pillar 1: Economy		**Pillar 2: Living Conditions**		**Pillar 3: Inequality**
PC 1	1. GDP per capita *(PPP, constant 2011 international dollars)* 2. National income per capita *(adjusted net; constant 2010 USD)* 3. Labor productivity *(GDP per person employed; constant 2011 PPP USD)* 4. Electric power consumption *(kWh/ person)*	PC 1	1. Under-five mortality rate *(deaths per 1.000 live births; Indicator SDG 3.2.1; inverted)* 2. Access to safe water services *(% of population)* 3. School enrollment, secondary *(% gross)* 4. Coverage of essential health services *(Indicator SDG 3.8.1)*	PC 1	1. Ratio of youth to adult employment rate *(modeled ILO estimate; inverted; symmetric transformation)* 2. Ratio of female to male employment rate *(modeled ILO estimate; inverted; symmetric transformation)* 3. Ratio of female to male labor force participation rate *(%; modeled ILO estimate; symmetric transformation)*
PC 2	5. Employment rate *(ratio to labor force; %; modeled ILO estimate)*	PC 2	5. Logistics performance index: Overall *(1=low to 5=high)* 6. Fixed Internet broadband subscriptions *(units per 100 people)* 7. Access to bank account or mobile-money services *(proportion of adults (15 years and older); Indicator SDG 8.10.2)*	PC 2	4. Income concentration ratio *(Gini index units; inverted)* 5. Poverty headcount ratio *(at 5.50 UDS a day; 2011 PPP; % of population; inverted)*****
PC 3	6. Exports of goods and services *(% of GDP)*	PC 3	8. CO_2 emissions *(kg per PPP USD of GDP; inverted)*	PC 3	5. Poverty headcount ratio *(at 5.50 UDS a day; 2011 PPP; % of population; inverted)***** 6. School enrollment, secondary *(gross)*, gender parity index *(symmetric transformation)*
				PC 4	7. Gender parity in the number of seats held by women and men in national parliaments *(derived from SDG indicator 5.5.1; symmetric transformation)*

* Note: PCs are new variables, each of which is calculated based on the meanings of all the pillar's indicators. In the table above PCs are placed next to the indicators included into them with the coefficients exceeding the determined minimum.

** Note: The indicator 3.5 has been to comparable extent a party to both PC 2 and PC 3.

2.b Missing values imputation

PCA methodology imposes strong requirements on the data, one of which is the requirement for comprehensive data sets. In other words, data sets must be complete if they are to be used.

As data sources differed, the completeness of datasets also varied. In general, the higher a country's level of development, the more complete the data. Therefore, the PCA requirement for complete data was initially only fulfilled for a limited number of variables or countries. If all incomplete variables and country data had led to their exclusion this would have resulted in a limited measure of inclusiveness and, most likely, a bias towards developed countries against developing and least developed countries. Consequently, imputation was employed to maximize the inclusion of available data.

Imputation was applied on a variable-by-variable basis.

For variables with a fixed frequency (i.e. every two or three years), time series were repaired by means of linear interpolation. Variables, such as, the logistics performance index (2.5); the proportion of adults with an account at a financial institution (2.7) are good examples of series that were repaired using this approach.

In other cases, external data were used to complete the dataset. For example, gaps in CO_2 emissions per unit of GDP since 2014, were filled using data from the Global Carbon Atlas. These data, up to the year of 2017, had a very high correlation (0.9971) with the official series. As another example, the information regarding the proportion of the population using safely managed drinking water services (2.2) was completed with the use of a highly correlated (0.8213) analogous variable (the proportion of the population using at least basic water services). The missing values were imputed using a regression model on the auxiliary variable.

For a complete description of the imputation methodologies followed for each indicator please refer to Annex II.

Although imputation enlarged the data availability considerably, not all series could have been restored and had, therefore, to be excluded from the analysis. To minimize data loss, all countries with complete information for at least one pillar's indicators were included in the calculations. Consequently, analyses could have been undertaken for 167, 131 and 90 countries for the first, the second and the third pillars respectively.

However, the final index was computed only for the 86 states with complete data available for all three pillars.

2.c Assigning weights to indicators and principal components

Once the data were repaired and processed to meet all the model specifications, it was then possible to identify the principal components of

inclusive growth using the PCA technique. The methodology facilitates the reorganization of multi-dimensional data into a set of uncorrelated principal components (PCs), each of which sequentially captures the maximum amount of data variance not accounted for by the previous components. The weights assigned to the indicators within a PC can therefore be treated as the elements of the matrix of a linear transformation.

The number of components identified within each pillar varied as the constituents of inclusive growth were selected from statistical perspective. Nevertheless, the results obtained are economically interpretable. The components' structure and underlying intuition are articulated in Table 3. For more details on statistical processing see Annex III.

Table 3. Identified principal components

Variance captured (%)	Indicators included	Economic intuition behind PC
Pillar 1: Economy Number of countries ranked: 168 Number of principal components identified: 3		
PC 1: Economic development		
55	GDP per capita	As noted above, GDP represents only one aspect of economic growth. Nevertheless, GDP per capita remains an important element of inclusive growth and is considered in PC 1.
	National income per capita	
	Labour productivity	
	Electric power consumption	
PC 2: Employment		
19	Employment rate	Labour is an inalienable driver of economic growth. The participation of labour in production processes (PC 2) is an indicator of whether a country's potential is fulfilled.
PC 3: Trade		
17	Exports, % GDP	PC 3 indicates the extent of an economy's openness and thus reveals its ability to compete on international markets.
Pillar 2: Living conditions Number of countries ranked: 129 Number of principal components identified: 3		
PC 1: Social and health conditions		
44	Under-5 mortality rate	PC 1 estimates access to basic life conditions such as water, education, medicine, child survival.
	Access to safe water services	
	School enrolment, secondary	
	Essential health services	

Variance captured (%)	Indicators included	Economic intuition behind PC
PC 2: Logistics and finance		
33	Fixed Internet broadband subscriptions	PC 2 represents population's access to less vital living conditions' characteristics: Internet, financial account, logistics.
	Logistics performance index	
	Access to bank account or mobile-money services	
PC 3: Ecological conditions		
13	CO_2 emissions	PC 3 adjusts the index for damage caused to nature by production units.
Pillar 3: Equality Number of countries ranked: 90 Number of principal components identified: 4		
PC 1: Equal labour participation		
31	Employment: adult / youth	PC 1 indicates the efficiency of labour force, assuming that the market operates on a level playing field.
	Labour force: male / female	
	Employment: male / female	
PC 2: Income equality		
21	Income concentration ratio	PC 2 emulates the efficiency of redistributing wealth generated by a nation.
	Poverty headcount ratio	
PC 3: Equal school enrolment		
16	Poverty headcount ratio School enrolment: boys / girls	As school attendance is a prerequisite for further career advancement. PC 3 incorporates this dimension.
PC 4: Equal political participation		
14	Number of seats in national parliaments: male / female	PC 4 represents females' opportunity to influence the decision-making process.

In order to rank countries within the pillars, the components were assigned coefficients that reflected their share of the total variance captured within a pillar.

2.d Aggregating pillars to index

Rankings within pillars may reveal countries' positions relative to one or other sphere of inclusive growth, whereas the aggregated index is intended to provide a full picture of a country's inclusive economic growth. The challenge in assigning weights to pillars is that this may be interpreted as prioritizing one sphere of growth over another. One way to avoid this

problem was to assign equal weights to each of the pillars. In line with this intuition, the exercise of applying PCA to each of the three sub-indices (pillars) stipulated that the new components should have corresponded to the three original vectors with coefficients equal to one. As such, the sub-indices accounted for the total variance of the dataset.

Table 4. The results of PCA for calculated sub-indices (No of observations: 86)

PC	Variance captured (%)	Indicators included	Weights assigned
PC 1	33	Pillar 1: Economic development	0.33
PC 2	33	Pillar 2: Living conditions	0.33
PC 3	33	Pillar 3: Equality	0.33

Therefore, based upon both intuitive and statistical approaches, each of the three pillars has an equal weight in the final aggregation of the overall composite index.

2.e Methodology – limitations

Although PCA provides a technique to avoid bias while attributing weights to the components of inclusive growth, the challenges arising from instability of the coefficients remain, as do sizeable changes in the index rankings. Furthermore, the indicator framework may require adjustments in future as new indicators become available, or as it is necessary to include new elements or dimensions into the concept of inclusive growth. For example, UNEP (2019) notes that more than 30 per cent of the environment-related SDG indicators still lack an agreed methodology. More broadly, the IAEG-SDG in May 2019 noted that 15 per cent of the SDG indicators are Tier 3 indicators, meaning that no internationally established methodology or standards are yet available. These limitations will be considered as the composite index of inclusive growth is further developed, and as new research in the fields of inclusiveness and sustainability become available.

3 ANALYSIS OF THE RESULTS

3.a Overall results

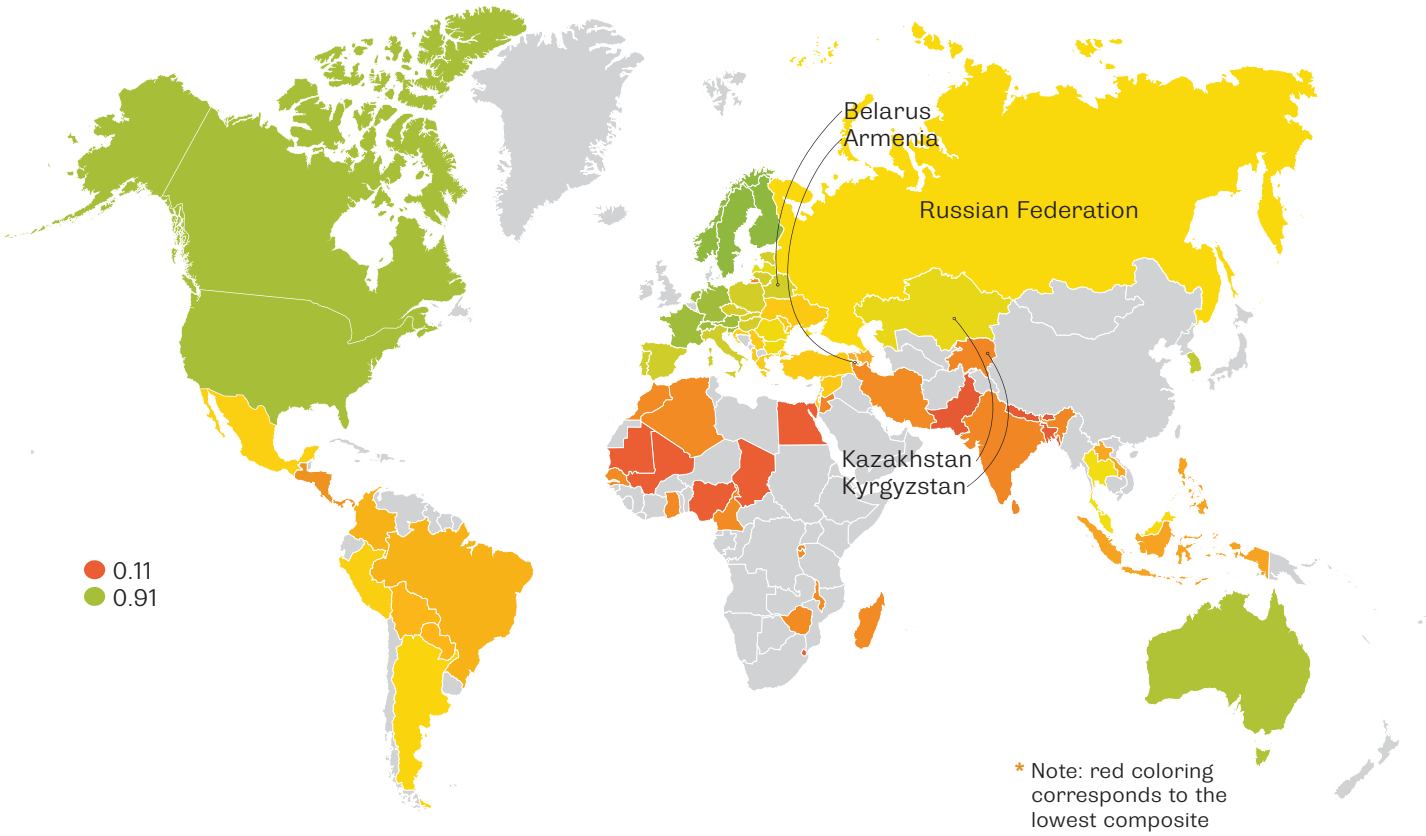
The construction of a composite index of inclusive growth has made it possible to reveal the disparities between regions of the world. An examination of the pillars provides some insights into the underlying reasons. To examine the full list of the assessed countries and the attributed scores, please, refer to Annex IV.

As could have been anticipated, higher levels of inclusive economic growth are generally associated with more advanced economic countries. Among the highest-ranked countries (by overall index score), are Luxembourg, Norway, and Denmark. In fact, the top-ranked 18 countries are all advanced economies. Furthermore, Israel and Republic of Korea, which appear to be the highest-ranked developing countries, score highly within the economic pillar, It is interesting to note that, the two extreme rankings for pillar 1, Luxembourg (the highest) and Lesotho (the lowest), are ranked differently for the other two pillars. Here, the equal pillar weights for the aggregate composite index is important, as there is no bias in favour of pillar 1.

The challenges of ensuring that the benefits of economic growth are distributed equally among all members of a society may not always be addressed until a country has reached a certain level of economic growth and prosperity.

That said, orientation towards inclusion is presumed to be advantageous. This assumption is supported by evidence from Rwanda. The country is the highest-ranked least developed country (LDC) outstripping 19 developing countries including Armenia and Kyrgyzstan due primarily to equal labour and decision-making participation. Having undergone a civil war and genocide that entailed labour market access to be universally accessible, Rwanda has managed to translate a curse into an advantage and has promulgated laws enshrining women's mandate, 3-month paid maternity leave and female parliamentarians' quota, which assisted in further ensuring gender equality. The level playing field created in the labour market has contributed to

Figure 1. Inclusive growth index. 2019. selected countries*



* Note: red coloring corresponds to the lowest composite inclusive growth index scores, and green to the highest ones.

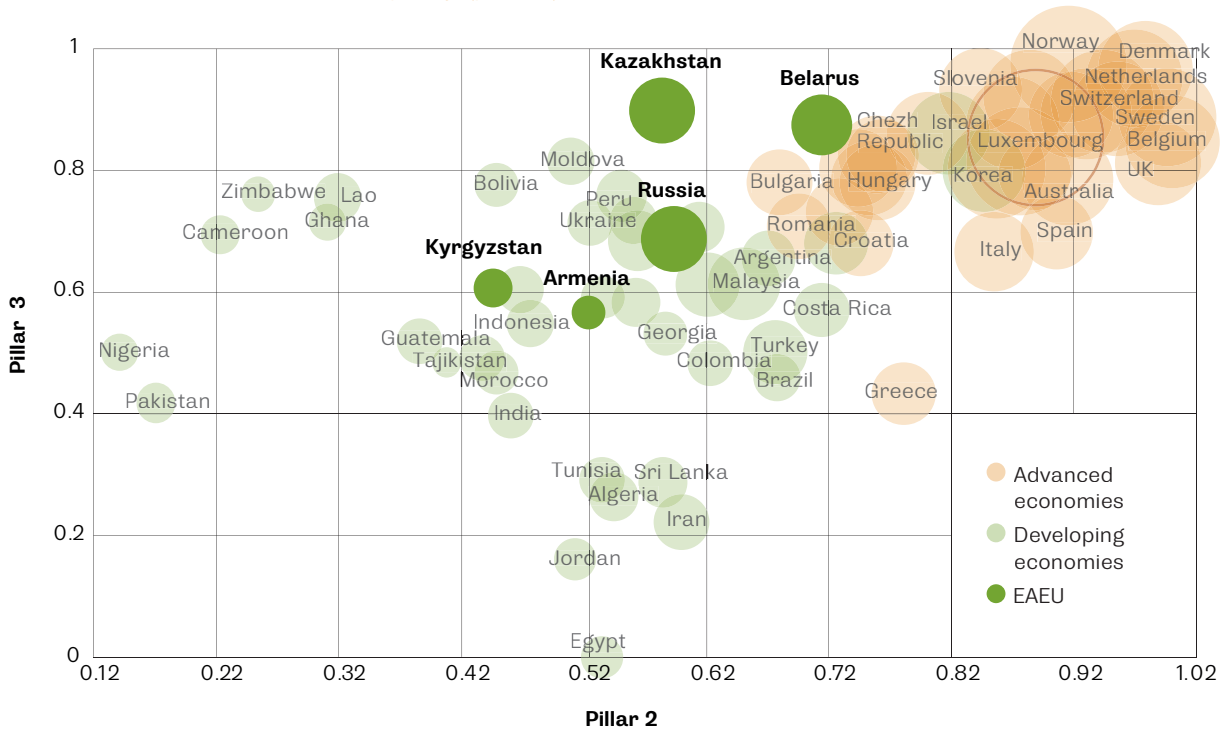
economic growth. This is reflected in the country's pillar 1 results surpassing those of virtually all the LDCs and 5 developing countries (including Armenia).

Developing countries appear to be the most heterogeneous group characterized by the largest gap in index scores between Israel (highest: 0.68) and Egypt (lowest: 0.21). Even more noticeable, the difference in inequality, where the two aforementioned countries have been assigned scores of 0.86 and 0 respectively. The most homogeneous group is the LDCs, for which the difference in the index scores does not exceed 0.28 points.

3.b Highlighting the similarities and differences across country groups

Not only has the construction of the composite index revealed global inclusiveness trends, but owing to its multi-layered architecture, it has also

Figure 2. Economic Performance in context of Living Conditions (pillar 2) and Equality (pillar 3)*



* Note: size of the bubble – economic performance (pillar 1).

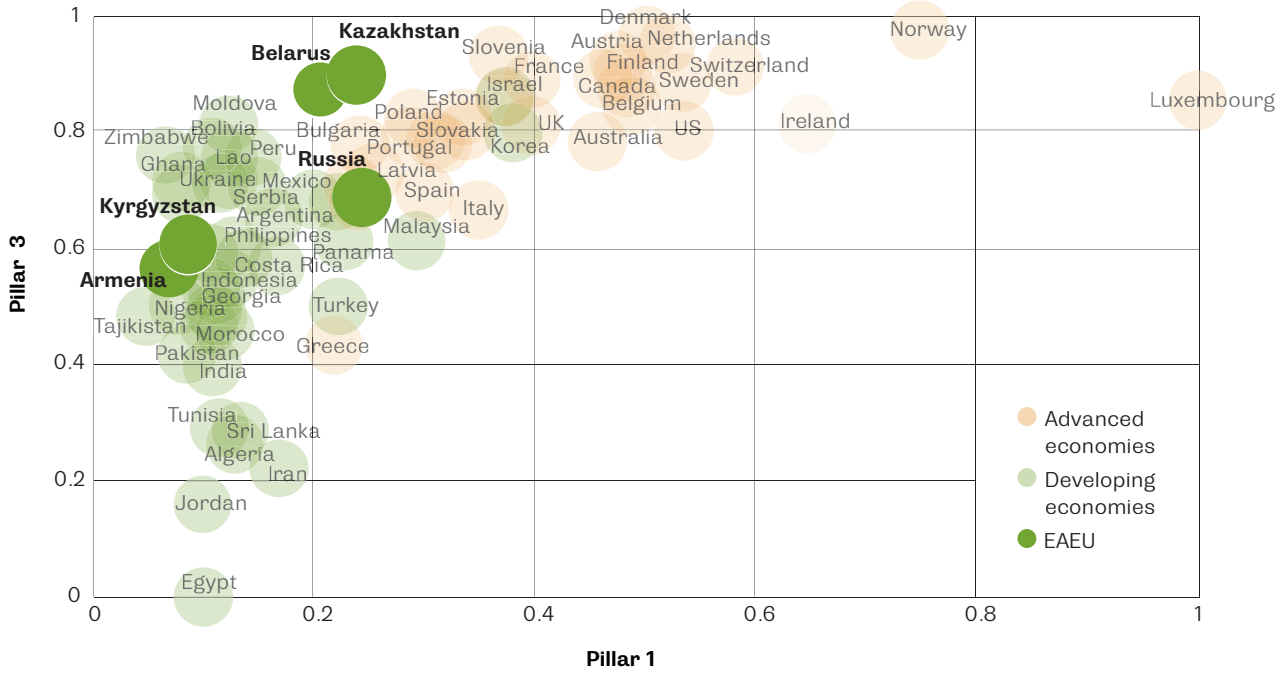
assisted in identifying similarities and differences across country groups. Furthermore, the graphs below are useful in highlighting the EAEU Member States' relative positions with regard to the three dimensions of inclusive growth.

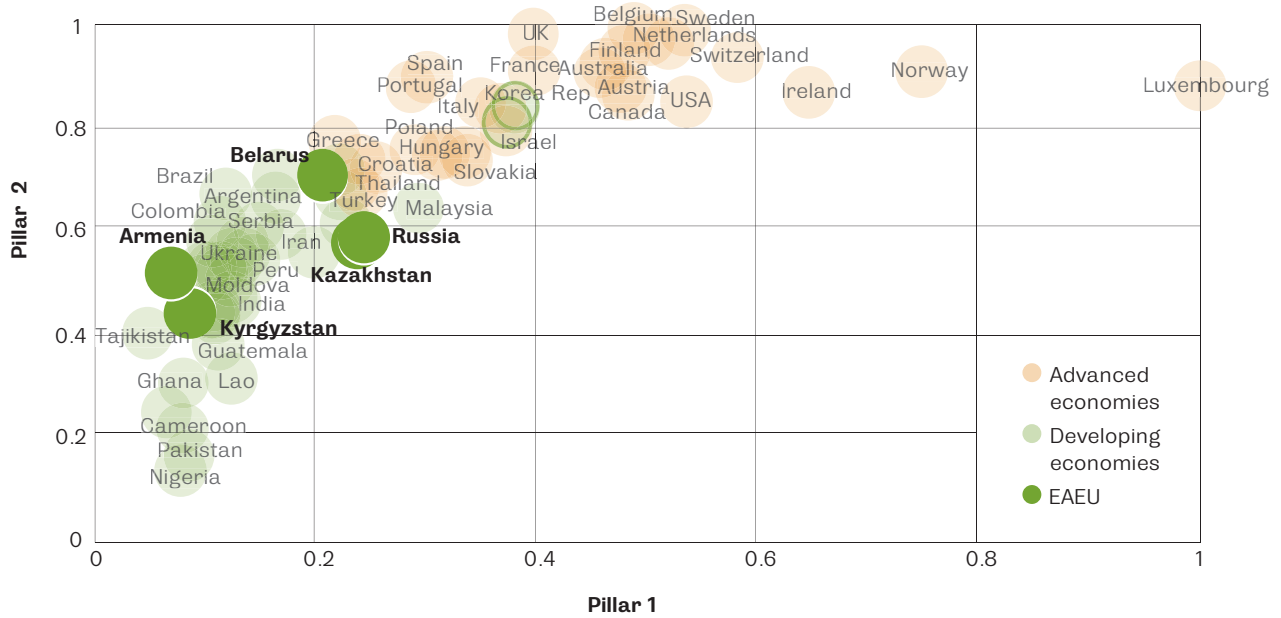
In Figure 2, the x-axis represents countries' estimations according to their living conditions (Pillar 2) and the y-axis corresponds to the levels of equality (Pillar 3). Economic performance as measured by the first pillar's indices is reflected by the size of the bubbles.

The group of countries near the top right corner is mainly comprised of the advanced economies (colored red) ranked highest both for equality and living conditions pillars. Meanwhile, the radii of the bubbles located in the North-East are generally larger than those of the developing states.

In Figures 3a and 3b, countries are more obviously clustered into groups along the x-axis (Pillar 1 – Economic Performance) than along the y-axis (Pillar 2 and 3). There are only two instances of developing countries with living conditions comparable to those in advanced economies (Israel and Republic of Korea). These two countries simultaneously enjoy lower inequality than the majority of developed countries. There is a number of outliers in the sphere of equality, including Greece appearing to be

Figure 3a (higher graph) - Economic Performance (pillar 1) V Equality (pillar 3);
3b (lower graph) Economic Performance (pillar 1) V Living Conditions (pillar 2).





suffering higher inequality levels relative to the majority of other developing economies; and Kazakhstan and Belarus for which the opposite is true.

Considering the outcomes for the other EAEU Member States, all three have demonstrated levels of inequality close to developing country averages, while living conditions seem to be moderately better in Russia and worse in Kyrgyzstan and Armenia compared to the same group.

Figures 3a and 3b reveal the correlation between the first and the second, and the first and the third pillars respectively. The two graphs are located one above the other so as to highlight the similarities and peculiarities of keeping the abscissa constant while changing an ordinate.

The countries' distribution in the two figures are very similar but not identical. States appear to be divided into two groups, similar to what was observed in figure 2. Israel and Republic of Korea retain their leading positions among the developing economies; however, the precedence of one over another can hardly be determined. Unlike figure 2 and 3b, figure 3a does not identify Greece, Belarus or Kazakhstan as outliers. In accordance with what has been noted above, living conditions seem to have the highest correlation with the country group affiliations, which explains lower pillar 2 estimation for Belarus and Kazakhstan and higher one for Greece.

Another conclusion stemming from Figures 3a and 3b is that higher estimates for pillar 1 seem to foster improvements in equality in the advanced economies. However, this does not necessarily appear to be the case for developing countries. The interconnection between pillar 1 and pillar 3 also tends to vary between developed and developing countries, although in the opposite way.

Hence, the following hypothesis was formulated: developed and developing countries form two distinct cohorts and should not be considered a single statistical population. In other words, living conditions and economic advances are not determined by a single function of economic development for all of the economies under consideration.

In order to test this hypothesis, a Chow test[9] was performed. The test can detect whether two groups of observations are part of a single population or not. The results stipulate that developing and advanced economies should be considered separately and that the character of interconnections between the pillars vary between these groups (refer to Table 5).

Therefore, it is possible to conclude that developing countries generally tend to invest the benefits of economic development into living conditions and are less likely to prioritize inequality issues until a certain economic standard and quality of life has been achieved. However, as indicated above, in the case of Rwanda, the effort to ensure equality can bear fruit regardless of the level of economic development.

For the EAEU countries, analyses of Figures 2-3b reveals the gap in economic performance between Armenia and Kyrgyzstan on the one hand, and Belarus, Kazakhstan and Russian Federation, on the other hand. But when the analysis is broadened beyond GDP growth to take into account the

Table 5. Chow test results
(No of observations for advanced economies: 31;
for developing economies: 43)

Test 1	Dependent variable: pillar 3 Independent variable: pillar 1 Observed statistics: 6.69 Critical statistics: 3.97		
	Full population	Advanced economies	Developing countries
Slope (standard error)	0.68 (0.09)	0.36 (0.1)	0.9 (0.34)
Residual sum of squares	1.51	0.24	1.14
Test 2	Dependent variable: pillar 2 Independent variable: pillar 1 Observed statistics: 54.17 Critical statistics: 3.97		
	Full population	Advanced economies	Developing countries
Slope (standard error)	0.93 (0.08)	0.32 (0.09)	1.54 (0.22)
Residual sum of squares	1.15	0.18	0.48

notion of "inclusiveness", then the Union's top economic performer can no longer be considered the best performing country overall.

It is worth noting that Luxembourg, the composite index's top ranked country, is outranked by some countries with regard to living conditions. Therefore, even in Luxembourg, the data suggest there is room for improvement.

3.c EAEU Member States "profiles" in terms of inclusive growth

The preceding sections discussed global inclusiveness trends from the perspective of country groupings formed according to the level of economic development. In this section, the determinants of the EAEU Member States are examined in the context of their global and intra-Union positions. The results identify areas of strength for each economy and suggest direction for change or improvement.

The Republic of Armenia

Armenia is assigned a global rank of 59th, which positions the country as forth within the EAEU.

The issues of wealth redistribution are identified as a risk for Armenian inclusive economic growth. The country's rankings within the economic pillar are the lowest within the group, owing to weak GDP per capita (ranked 98th

globally); adjusted net income per capita (ranked 108th); and GDP per person employed (ranked 100th). To illustrate, in 2017, GDP per capita expressed in PPP constant 2010 international dollars was 8,787.6, less than half of developing countries' average.

The third pillar's estimations for Armenia are also lower than for other Union members, Inequality is the most pertinent issue from the perspective of labour market access for different age groups (ranked 86th globally) and women's opportunity to take part in decision-making processes (ranked 66th). It appears that Armenian women are either not able or eager to join the labour force. However, once they have entered the market, they are as likely to be offered a job as male workers are. In Armenia, the index reflecting the difference between men and women's chances of employment is estimated as high as 0.996 (where 1 implies absolute equality), which corresponds to the ranking of 22nd and the second best within the Union. At the same time, the disparity in proportions of economically active men and women remains noticeable: in 2018, female accounted for 42.2% of the labour force, leading to a ranking of 57th, the second lowest within the EAEU.

As far as living conditions are concerned, Armenia is positioned in the lower half of the rankings according to each of the indicators. However, it should be noted that the country is characterized by the lowest CO_2 emissions within the Union. This fact should be considered with due caution, since it may indicate to industrial underdevelopment rather than production modernization. The second pillar's indicators also seem to identify avenues for political action, the most urgent being access to safe water services, which were accessible by only 61% of population in 2015.

The constraints to inclusive economic growth in Armenia appear to coincide with those to economic growth in general. Therefore, two problems may be addressed simultaneously, since the levers employed to accelerate GDP growth and included in the national development agenda may act more efficiently, should the challenges of inclusiveness be taken into consideration.

The Republic of Belarus

Belarus is assigned a global rank of 30th, which positions the country as the best overall performer within the EAEU.

Belarus appears to have succeeded in numerous aspects of inclusive economic growth, Its advances are noteworthy both at intra-Union and international level. The country is characterized by a low poverty headcount ratio (no more than 0.8% of population live at 5.5 PPP constant 2011 USD a day or less, corresponding to 15th position globally). The Gini index in Belarus was estimated at 27 points in 2016, which exceeded the advanced countries group average but corresponds to the 2nd best result among the developing economies (second only to Ukraine).

Among the EAEU. Belarus has demonstrated the best results for the 2nd pillar as a whole and for a number of indicators in particular. The republic enjoys the highest exports to GDP ratio (67%) in the Union; the lowest under-5 mortality rate (3.7 deaths per 1000 live births); the most accessible

safe drinking water (94.4% of population) and health services (74% of population); the most accessible broadband subscription (33 per 100 people); the most favourable financial services access (81.2% of adults); the best equality income redistribution system (Gini index estimated at 27 points); the lowest poverty headcount (0.8% of population); and the largest share of female parliamentarians (34.5%).

Nevertheless, these achievements should not be interpreted as indicating that no further advancement is required. The logistics performance index in Belarus is estimated at 2.6 (out of 5), 5.5% lower than the developing countries' average and even lower than LDCs average. Other areas for improvement: the labour market appears to be intolerant of male workers, who are more than 1.5 times as likely to be unemployed as female workers are. Perhaps, this result might indicate men's shadow sector activities.

Despite excellent progress, Belarus must continue to improve economic issues, such as, labour force productivity. The ratio of GDP to number of persons employed in Belarus 33,807.6 PPP constant 2011 USD compared with a developing country average of 38,961.2.

Thus, despite being the best performer of the EAEU, from the perspective of inclusive economic growth the Republic of Belarus still has the potential to improve.

The Republic of Kazakhstan

Kazakhstan is assigned a global rank of 31st, which positions the country as the second best performer within the EAEU.

Kazakhstan's overall ranking is only one position lower than that of the Republic of Belarus. For some individual indicators Kazakhstan outperforms Belarus. Namely, the country's labour market and education systems appear to be more impartial with regard to both gender and age.

Among the Republic's strengths: overall secondary school enrollment (ranked 18th globally) and its accessibility for boys and girls (ranked 17th); the ratio of female to male labour force participation (ranked 25th) and discrepancies between young and adult workers. As far as the latter indicator is concerned, the gap between youth and adult unemployment rates is only 0.9 percentage points (in favour of young), which corresponds to the world's second-best result, exceeded only by Rwanda.

Nevertheless, the caution should be exercised when interpreting the results. For example, the indicator "gross secondary school enrollment ratio" was estimated at 113.1% for Kazakhstan in 2017. This variable measures the ratio of attendance at secondary school classes to the corresponding age population appropriate to this education level. Estimates exceeding 100% suggest there may be problems with academic year repetitions or late education starts.

There remain inclusiveness challenges to be addressed by Kazakhstan's national policies. From the perspective of the economic pillar, the country's major challenges will be to participate in international trade and labour

markets. The exports of goods and services from Kazakhstan account for only 34.4% of GDP. explaining its ranking of 91st. As far as living conditions are concerned, the Republic appears to underestimate the importance of ecological development. In 2017, the volume of CO_2 emissions totaled 0.59 kg per GDP PPP USD as compared with a developing country average of 0.24.

Government programs that aim at providing businesses with incentives to participate in international trade practices and production modernization (greening) processes to further improve inclusiveness are likely to bear fruit.

The Kyrgyz Republic

Kyrgyzstan is assigned a global rank of 61st, which positions the country as the fifth in the EAEU.

The observed failure to ensure inclusive economic growth in Kyrgyzstan appears to be a double-fold problem caused by both economic and social factors.

The weakness of inclusive growth in Kyrgyzstanis reflected by numerous indicators, including adjusted net income per capita (ranked 143rd); GDP per capita (ranked 134th); GDP per person employed (ranked 133rd); and the poverty headcount (ranked 71st). Meanwhile, it would be erroneous to conclude that the situation is the result of unfair wealth redistribution in the economy: Kyrgyzstan's Gini index scores 34.1 points, corresponding to 39th in the global rankings and indicates lower income inequality than, for example, in the Russian Federation. Hence, the problems of economic development seem to affect the majority of the country's citizens rather than a vulnerable minority.

As regards social disadvantages, the major one is Kyrgyz living conditions. To illustrate, fixed broadband connection is available for only 4.3% of population as compared to an average of 4.6% for LDCs and 19.9% for the rest of the EAEU, on average. Another example, the under-5 mortality rate totals in Kyrgyzstan to 20 cases per 1000 live births, corresponding to the 80th position globally. The situation is partly explained by the fact that universal health services only cover 66% of the country's population (ranked 70th).

Another constraint to inclusive economic growth in Kyrgyzstan is the lack of corporate responsibility. Although manufacturing businesses are not numerous yet, the existing ones are already posing threats to the natural environment. CO_2 emissions in Kyrgyzstan amounted to 0.6 kg per GDP PPP USD in 2017, which is comparable to the level experienced by much more industrially developed countries, including Kazakhstan and Russia.

On a positive note, Kyrgyzstan is the world's most unbiased country from the perspective of female to male school enrollment ratios. The indicator is virtually equal to 1.

It may be concluded, hence, that the Kyrgyz Republic economic growth agenda must address both the challenges of spurring the economy and

those of ensuring inclusiveness. It seems that as the EAEU partners have managed to attain better results in tackling the matter, Kyrgyzstan has an opportunity to consider their experiences and further leverage the adoption of inclusive growth practices.

The Russian Federation

Russia is assigned a global rank of 38th, positioning the country third within the EAEU.

As might have been expected, the Russian Federation has demonstrated the best intra-Union results according to "Economy" pillar. All the country's indicators in this pillar appear to outperform those of the Union's partners except for exports to GDP ratio, which is the lowest within the EAEU (26.04%). However, the wealth gained by the country's economic agents is unlikely to be equally redistributed, which is demonstrated by poor Gini index estimation (43.9 as compared with an average 31.5 points for the rest of the Union).

As far as the country's social advancements are concerned, the Russian Federation has the most competitive labour market, which is characterized by only a 0.3 percentage point gap between male and female unemployment rates in favour of the latter. A different picture emerges for women's access to decision-making processes, however. Parliamentarian seats are also less likely to be accessed by women compared with other jobs, and as a result 85% of the legislative body representatives are male (ranked 71st).

As regards living conditions in Russia, indicators suggest that life is reasonably comfortable (with good access to the Internet and the financial system). That said, only 63% of the population had access to universal health services in 2017 (ranked 82nd), and 24.6% of the population had no access to safely managed drinking water services in the same year (ranked 71st). Another concern affecting the country's living conditions is connected to environment pollution. The volume of CO_2 emissions was 0.45 kg per GDP PPP USD in 2017, ranking the country 121st globally.

The inclusiveness analysis for the Russian Federation is another good illustration of the necessity to search for alternatives to GDP. The country is the Union's major economy, yet an examination from an inclusive perspective reveals the country's weaknesses hidden by the GDP advantage and suggests that living conditions and inequality challenges remain important issues for the political agenda.

3.d Comparative analysis of the EAEU Member States in terms of inclusive growth

Analysis of the EAEU Member States profiles has outlined that the group is quite heterogeneous and their relative strengths vary considerably across and within the pillars. Furthermore, no one of the EAEU Member States'

relative ranking is consistent across the three pillars, indicating there is no top performer or under performer in the Union.

The examination does reveal some noteworthy similarities and peculiarities.

From the perspective of the index pillars, the 1st pillar (Economy) generally tends to highlight countries' worst rankings. The majority of higher-quintile rankings appear to concentrate among the 3rd pillar indicators.

Breaking the analysis down at indicator level, the most challenging inclusiveness issues seem to be connected to accumulating net income per capita, providing incentives for environment protection and guaranteeing logistics efficiency. At first glance, these issues may seem unconnected but in fact, they are. Efficient logistics is essential for connecting firms with markets and consumers, irrespective of whether they are domestic or international; this sphere is an important policy issue for the EAEU as it enjoys intra-Union free movement of goods, services and people. Care with regard to environment protection assists in creating a country's corporately and socially responsible brands and helps to improve the likelihood of developing international business contacts. Both of these issues appear to be influencing the population's aggregate income. Improvements may be followed by enhancements in per capita GDP, should correct policies be put into practice.

The differences in indicator rankings across Union should not be disregarded. They highlight spheres for prospective collaboration between countries, where the experiences of a successful country may help in the development of another. This collaboration can have a positive impact in three dimensions: exchanging experiences in infrastructural, institutional or human issues.

Discrepancies in the spheres of safe water access and Internet connection availability are clear. In 2017, 33% of Belarus' population had a fixed broadband connection, whereas the corresponding share in Kyrgyzstan was 4.3%. The challenges of inclusive growth cannot be addressed unless infrastructural reforms are initiated, such as ensuring sustainable systems for water supply and plumbing and Internet communication. There is room for experience sharing, not only from a governance perspective, but also from the point of view of developing or sharing skilled contractors.

Other spheres of presumably fruitful cooperation include sectors that require institutional changes, namely, education and healthcare systems. Perhaps Kyrgyzstan and Armenia can learn from the experience of Belarus on how to enhance the quality of health-protection services (including but not limited to the provision of medical research and pre-natal and postnatal care equipment), which could assist in lowering children mortality rates from current highs of 20 and 12.6 cases per 1000 live births respectively. Similarly, Belarus, Kazakhstan and Russian Federation appear to have already built inclusive education systems and may be able to contribute to helping Armenian and Kyrgyz develop policies that will develop their education system in a corresponding direction.

Table 6. The EAEU indicators of inclusive growth heat map*

	Armenia	Belarus	Kazakhstan	Kyrgyzstan	Russia
Composite index	**59**	**30**	**31**	**61**	**38**
Pillar 1: Economy	**149**	**58**	**50**	**126**	**47**
GDP per capita	98	64	51	134	49
National income per capita	108	85	69	143	65
Labour productivity	100	78	58	133	55
Electric power consumption	82	59	35	85	29
Exports, % GDP	78	24	91	85	120
Employment rate	157	90	76	108	74
Pillar 2: Living Conditions	**78**	**40**	**67**	**89**	**64**
Under-5 mortality rate	63	19	58	80	44
Access to safe water services	88	37	46	84	71
School enrollment, secondary	75	39	18	54	34
Coverage of essential health services	66	45	53	70	82
Fixed Internet broadband subscriptions	65	19	57	83	44
Logistics performance index	83	91	66	95	70
Access to bank account or mobile-money services	80	46	68	100	52
CO_2 emissions	74	111	126	122	121
Pillar 3: Inequality	**67**	**14**	**9**	**61**	**51**
Employment: youth / adult	86	21	2	55	58
Employment: male / female	22	76	53	73	20
Labour force: male / female	57	34	25	71	46
Income concentration ratio	46	12	16	39	73
Poverty headcount ratio	63	15	40	71	24
School enrollment: boys / girls	59	23	17	1	20
Number of seats in national parliaments: male / female	66	21	40	60	71

* Note: red color – lower rankings, green color – higher rankings

Finally, the EAEU Member States have not been equally successful in providing incentives for fair labour market competition. International experience reveals that disparities between male and female, young and adult workers are not reduced until authorities set out a clear vision that makes equality a priority and translate this into legislative incentives (which is, inter alia, proven by the case of Rwanda) or social support programs. From this perspective, Kazakhstan's numerous programs supporting young qualified professionals and recent graduates may be of value for Armenia and other EAEU Member States.

We conclude by noting that common problems may present spheres for collaboration between the EAEU Member States. Sharing experiences within the Union may help to leverage and accelerate the processes of improving inclusive economic growth.

CONCLUSIONS

1

The broad concept of inclusive growth envisages economic growth improving everyone's quality of life equally. However, it remains an open question what precisely inclusive growth is, how it should be measured or how it can be achieved. The Eurasian Economic Commission (EEC) and the United Nations Conference on Trade and Development (UNCTAD) have joined forces to contribute to these important debates.

There are many factors affecting the inclusiveness of economic growth occurring within a country, so policymakers may have difficulties designing effective policy measures. Some may argue that complexity is unavoidable, as all dimensions of inclusive growth must be quantified. The counter argument is that it is possible and necessary to distil information to enable a "focused" policy response. This analysis adopts the latter approach and presents a synthesis of the principle components of inclusive growth based on a selection of indicators.

2

The study defines "inclusive growth" as a convergence in the quality of life of all population groups within a country, achieved not only through the governmental redistribution of economic performance outcomes, but also through the creation of favorable, non-discriminatory economic conditions that allow each population group to achieve self-sufficiently quality of life comparable to other groups and contributing to the improved quality of life of the entire population.

3

Inclusive growth is seen as a multifaceted phenomenon. The main characteristics are not easily conceptualized, measured or presented in statistical form. Consequently, as yet, there is no generally recognized set of indicators or policy prescriptions for countries to adopt. To date, the focus has been on economic performance, but the limitations of GDP as a metric of progress are now increasingly recognized. Today, we are in an interregnum period, where it is accepted that the old metric is not suitable

for the purposes to which it is being used, but a suitable alternative has not yet been found. Although it can be argued that the 2030 Agenda and SDGs in their totality approximate inclusive growth relatively well, the 2030 Agenda only calls for the development of "measurements of progress on sustainable development that complement GDP" and proposes no indicators tackling the issue. As a result, in order to address the challenge of elaborating inclusive growth metrics, international organizations have developed a variety of dashboard and single aggregate indices.
At the same time, the choice between a dashboard and an aggregate index is of importance at the national level, as countries need to target or prioritise elements of economic development, education, political participation, depending on local circumstances. But what information should countries use to identify the target to be prioritised? Whereas indices render it possible to calculate a single mark enabling global rankings, a dashboard may appear less biased as it avoids the problem of weighting and prioritizing the underlying indicators.

4

In order to be able to rank countries while at the same time remaining fair, this study suggests analyzing inclusive economic growth from two perspectives: using a global composite index with rankings, combined with principal components or pillars. The analysis presented in this report distils the issues highlighted by providing both an aggregate index and component sub-indices, providing countries with a set of metrics that will allow them to prioritise their actions.

5

Results from other international research suggest that inclusive economic growth may be revealed using the analyses of principal components, or main clusters, which are of central importance to achieving inclusive growth, namely:

- Economic pillar composed of economic development, trade openness and employment clusters:
- Living conditions pillar composed of three clusters on social and health conditions, logistics and finance, natural environment;
- Equality pillar composed of four clusters looking at equality in labour participation, income, school enrolment and political participation.

These three pillars constitute the aggregate composite index.

6

As far as the issue of assigning weights is concerned, three main approaches were identified:

- allocating equal weights;
- determining weights based on experts' view; or
- assigning weights based on statistical methodology.

This study has followed the third approach as it was considered the most neutral and least biased. The principal component analysis assigned weights according to the extent to which a variable influenced the dataset variance; the same technique was used to attribute coefficients to the pillars within the index.

7

According to the rankings established by the composite index, higher inclusive economic growth is generally observed in more advanced economies, and in Luxembourg, Norway and Denmark in particular. At the other end of spectrum are the least developed countries, including Mali, Chad and Lesotho. It appears that the issues of inequality generally receive attention only after a certain level of economic development has been attained. However, focusing on inclusive growth at an earlier stage of development may be fruitful, as is suggested by the case of Rwanda: the highest-ranked LDC, Rwanda has prioritized labour market impartiality from the outset of its statehood.

8

The Eurasian Economic Union Member States have experienced unequal levels of inclusive economic development. Belarus and Kazakhstan are ranked 30th and 31st respectively, close to or even higher than many advanced economies, which is especially remarkable from the perspective of the inequality pillar. The Russian Federation is ranked 38th and has average living conditions and inequality levels equivalent to countries with higher than average economic development. The Union's smallest economies, Armenia and Kyrgyzstan appear to have the least inclusive economic growth of Union members, ranked 59th and 61st respectively.

9

The analysis suggests that the Member States appear to have similar challenges. For example, common to all five countries, the challenges associated with logistics or environmental protection appear to represent avenues for prospective joint action.

At the same time, intra-Union rankings are not consistent from one pillar to another and hence there is no clear best performer within the Union. This suggests that there are opportunities to share experiences and better practices, which could take place in three major forms:

- institutional reforms;
- infrastructural enhancement; and
- social policy adjustment.

Examples of information sharing could include but are not limited to: Internet access provision and children healthcare in Kyrgyzstan (based on the experience of Belarus); or adopting the experience of young professional support programs in Kazakhstan.

10

The results gained from the EEC and UNCTAD joint analysis contribute to the debates on inclusive growth. Moreover, it provides a working methodology for how inclusive growth could be measured, which could be valuable for the policymakers. Finally, the report promotes the implementation of an inclusive approach in national policies across the EAEU Member States.

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NOTES

1 Foreword to the publication "Promoting Inclusive Growth: Challenges and Policies" (de Mello & Dutz, 2012).

2 For more on that, see UNCTAD, 2012, and UNCTAD, 2017.

3 For more details see essays in Barrowclough, 2018.

4 For more details, see Gallagher & Kozul-Wright, 2019.

5 For more information, see Europe 2020 headline indicators. Retrieved from http://ec.europa.eu/eurostat/statistics-explained/index.php/Europe_2020_headline_indicators

6 It is permitted to examine median households of decile population groups formed by income level without considering every household separately.

7 Chakrabarty (2011) defines financial inclusion as the process of ensuring access to appropriate financial products and services needed by all sections of the society in general and vulnerable groups such as weaker sections and low income groups in particular, at an affordable cost in a fair and transparent manner by regulated mainstream institutional players (see https://www.bis.org/review/r111018b.pdf).

8 The Gini index measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution (The OECD glossary of statistical terms. https://stats.oecd.org/glossary/index.htm).

9 Chow test is a widely recognized technique of identifying whether the subpopulations belong to a single population. To see the examples of the method's utilization refer, for instance, to UNCTAD, 2018.

10 Sourced from the World Economic Forum (WEF) The Inclusive Development Index 2018: http://www3.weforum.org/docs/WEF_Forum_IncGrwth_2018.pdf

ANNEX

I Principal Component Analysis

Principal component analysis is probably the oldest and the best known of the techniques of multivariate analysis. It was first introduced by Pearson (1901) and developed independently by Hotelling (1933). PCA is an ordination-based statistic data exploration tool that converts a variety of potentially correlated variables (with some shared attribute, like points in space or time) into a set of uncorrelated variables that capture the variability within the underlying information. As such, PCA can be used to emphasise patterns among multivariable data. PCA uses orthogonal linear transformation to identify a vector in N-dimensional space. This first principal component (pc1) accounts for the maximum amount of the total variability in a set of N variables, where the total variability within the data is the sum of the variances of the observed variables, when each variable has been standardized (to have a mean of 0 and a standard deviation of 1). A second vector (pc2), orthogonal to the first, which accounts for the maximum of the remaining variability in the original variables. Each succeeding pc is linearly uncorrelated to the others and accounts for the maximum of the remaining variability (Jollifie, 2002).

PCA can be used as descriptive, statistical approach to data transformation as a method of overcoming variable incommensurability. The ranking of the principal components in order of their significance (based on what proportion of the variability within the information they capture) is denoted by the eigenvalues related to the vector for each pc. In the case of a spatially explicit analysis each data point for each variable is related to a specific point in space and the principal components derived from the PCA can be assigned as scores (synthetic variable values) for each of these points in space.

In this study, PCA analysis was undertaken using the Stata software. We conceptualise the PC scores associated with the multiple variables of inclusive growth. As none of the sub-indices within the three pillars were

highly correlated, all sub-indices were retained in the PCA analysis. By retaining only those principal components that account for a substantial proportion of the variability in the original data a smaller number of independent indices of inclusive growth can be generated.

The results presented here correspond to PCA with orthogonal rotation. We proceed to orthogonal rotation to maximize the variance of coefficients. We increase the explained variance of the sample by the components and we reduce the unexplained variance.

In addition, the rotation increases the specificity of each component which allows a more precise component analysis. The higher dispersion of countries in the PCA before rotation could, therefore, be explained by the expression of origin variables, the weighting of which is modified after rotation.

II Methodological notes for sub-indices

Some of the sub-indices have been inverted to make the interpretation of the PCA results more straight forward. The values have been inverted by deducting the original figure from the theoretical maximum value of the sub-index. The actual maximum value is used in the absence of a clear theoretical maximum. After the transformation, all sub-indices basically show a higher figure for a better result.

When developments are described for individual countries, we suggest using the original sub-indices that have not been inverted or otherwise transformed. The transformations are intended only for the use of these indices as part of the pillars and the index.

a) Economy

- *GDP per capita PPP (constant 2011 international US dollars)*
  Source: World Bank, International Comparison Program database.
- *Adjusted net national income per capita (constant 2010 USD)*
  Source: World Bank staff estimates based on sources and methods in World Bank's "The Changing Wealth of Nations: Measuring Sustainable Development in the New Millennium" (2011).
- *Labor productivity, USD/person (GDP per person employed (constant 2011 PPP USD))*
  Source: International Labour Organization, ILOSTAT database.
- *Electric power consumption, kWh/person*
  Source: IEA Statistics (iea.org/stats/index.asp)
- *Employment rate (ratio to labor force), 15+, total (%) (modeled ILO estimate)*
  Source: International Labour Organization, ILOSTAT database.
- *Exports of goods and services (% of GDP)*
  Source: World Bank national accounts data, and OECD National Accounts data files.

b) Living conditions (infrastructure, education, healthcare):

- *Under-five mortality rate (deaths per 1.000 live births) (Indicator SDG 3.2.1) (inverted)*
  Source: World Health Organization (WHO). Estimates Developed by the UN Inter-agency Group for Child Mortality Estimation (UNICEF, WHO, World Bank, UN DESA Population Division) at childmortality.org.
  Transformation: This indicator has been inverted by using its observed maximum among the countries. In the inverted form, the higher the figure the more there are live births.
- *People using safely managed drinking water services (% of population)*
  Source: WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply, Sanitation and Hygiene (washdata.org).

Imputation: The indicator "people using safely managed drinking water" is preferred as a more relevant indicator for medium-to-high income countries, such as EEC countries. However, data are not available for many countries. A related indicator on "people using at least basic drinking water" is available for almost all countries. Therefore, we have imputed the preferred indicator using the related indicator since they have a high correlation (0.82). The imputation was done for all missing data, including for Kazakhstan, through a quadratic regression model. Both indicators are currently available up to 2015.

- *School enrollment, secondary (% gross)*
  Source: UNESCO Institute for Statistics (uis.unesco.org)
- *Coverage of essential health services (SDG indicator 3.8.1)*
  Source: Universal health coverage (UHC) service coverage index by the WHO and the World Bank.
- *Logistics performance index: Overall (1=low to 5=high)*
  Source: World Bank Logistics Performance Index Surveys. Data and methodology are available at: worldbank.org/lpi
- *Fixed Internet broadband subscriptions per 100 people, units*
  Source: International Telecommunication Union, World Telecommunication/ICT Development Report and database.
- *Proportion of adults (15 years and older) with an account at a bank or other financial institution or with a mobile-money-service provider (SDG indicator 8.10.2)*
  Source: Global Financial Inclusion Database, World Bank.
- *CO_2 emissions (kg per PPP USD of GDP) (inverted)*
  Source: Carbon Dioxide Information Analysis Center, Environmental Sciences Division, Oak Ridge National Laboratory, Tennessee, United States.
  Transformation: This indicator has been inverted by using its observed maximum value among countries. In the inverted form, the higher the figure, the less there are CO_2 emissions per GDP.

c) Equality:

- *Ratio of youth to adult employment rate (modeled ILO estimate) (inverted) (symmetric transformation)*
  Source: International Labour Organisation (ILO).
  Transformation: The indicator is calculated based on the ILO unemployment rates by sex and age, the ILO modelled estimates. The index was first inverted into a variable with a positive direction: "not unemployed" = 1 – unemployment. Then it has been transformed into a parity ratio. The same rate for adults and youth is equal to one, which is the best possible value. Given the symmetric transformation around one, all deviations from parity reduce the value.
- *Ratio of female to male employment rate (modeled ILO estimate) (inverted) (symmetric transformation)*

Source: International Labour Organisation (ILO).
Transformation: The indicator is calculated based on the ILO unemployment rates by sex and age, the ILO modelled estimates. The index was first inverted into a variable with a positive direction: "not unemployed" = 1 – unemployment. Then it has been transformed into a parity ratio. The same rate for female and male is equal to one, which is the best possible value. Given the symmetric transformation around one, all deviations from parity reduce the value.

- *Ratio of female to male labor force participation rate (%) (modeled ILO estimate) (symmetric transformation)*
  Source: International Labour Organisation (ILO).
  Transformation: The symmetric transformation around perfect parity was applied so that a 50-50 parity in the labour force participation becomes the highest value (value 1) and all other distribution in any sense reduces the value.

- *Income concentration ratio (Gini index), units (inverted, source WEF)*
  Source: World Economic Forum WEF[10] for better country coverage for the latest data. Original data source: The Standardized World Income Inequality Database (SWIID). The indicator measures how much the net distribution of income (post-tax, post-transfers). among individuals or households within an economy deviates from a perfectly equal distribution. The Gini coefficient varies between 0 and 100. A Gini of 0 represents 0 concentration in a country's income distribution. In other words, in a country with a Gini coefficient of 0, everyone receives the same income. 100 represents the maximum inequality.
  Transformation: Since the indicator varies between 0 and 100, it has been inverted by using its theoretical maximum of 100 (instead of the actual observed maximum value). In the inverted form, the higher the number the less there is income inequality. After inversion, 100 represents the maximum equality.

- *Poverty headcount ratio at 5.50 USD a day (2011 PPP) (% of population) (inverted)*
  Source: World Bank. Data are based on primary household survey data obtained from government statistical agencies and World Bank country departments. Data for high-income economies are from the Luxembourg Income Study database.
  Transformation: Since the indicator varies between 0 and 100 (% of population), it has been inverted by using its theoretical maximum of 100. In the inverted form, the higher the number the less there is poverty, e.g. less people with 5.50 USD or less per day.

- *School enrollment, secondary (gross), gender parity index (GPI) (symmetric transformation)*
  Source: UNESCO Institute for Statistics (uis.unesco.org).
  Transformation: A symmetric transformation where perfect parity (one) is the highest value and every deviation from it, either positive or negative, reduces the value. So, value 1 would represent full equality and 0 maximum inequality.

> *Gender parity in the number of seats held by women and men in national parliaments (derived from SDG indicator 5.5.1) (symmetric transformation)*
Source: Inter-Parliamentary Union (IPU) (ipu.org).
Transformation: The indicator is transformed based on the IPU indicator on the proportion of seats held by women in national parliaments (% of total number of seats), It has been transformed so that a 50-50 parity in the Parliament becomes the highest value (value 1) and all other distribution in any sense reduces the value.

III Principal Component Analysis outcomes

The PCA was applied to the complemented, imputed and standardized data sets. The selected indicators are measured in different units, they are not directly additive. Therefore, it was necessary to convert them into standard comparable units, to eliminate any bias of the initial scale. Each variable has been standardized to have a mean of 0 and a standard deviation of 1.

For the first pillar, economy, we identify three principal components by using the PCA. The analysis is based on 168 observations, i.e. countries that have data for all seven indicators. Together, these principal components explain 91 per cent of the total variance of six sub-indices that EEC has selected to measure the economy in this context.

Table 1 presents the three components and the contribution that each of the seven sub-indices makes to explaining the variance in the observed variables for the economy. For example, the first component, economic development, accounts for 55 per cent of total variance. The second component, employment, accounts for 19 per cent of the remaining variance, and the third component, export to GDP ratio, accounts for another 17 per cent.

Table 1. Retained principal components (eigenvectors) for pillar 1

Number of observations 168
Number of PCs 3
Rho 0.9062

Components	Variance	Difference	Share in original variance	Cumulative variance
PC 1	3.29712	2.16322	0.5495	0.5495
PC 2	1.1339	0.12759	0.189	0.7385
PC 3	1.00631		0.1677	0.9062

Rotated components (blanks correspond to coefficients with absolute meaning <0.34);
Rotation: orthogonal varimax (Kaiser off)

Variables	PC 1	PC 2	PC 3	Unexplained variance
GDP per capita	0.4769			0.05983
National income per capita	0.5037			0.1379
Labour productivity	0.4664			0.06598
Electric power consumption	0.549			0.2353
Employment rate			0.9956	0.001033
Exports, % GDP		0.9086		0.06258

For the second pillar, living conditions, we identify three principal components by using the PCA. The analysis is based on 129 observations, i.e. countries that have data for all seven indicators. Together, the three identified principal

components explain 90 per cent of the total variance of the seven sub-indices that EEC has selected for the measurement of living conditions.

Table 2 presents the three components and the contribution that each of eight sub-indices makes to explaining the variance in the observed variables for living conditions. For example, the first component, social & health conditions, accounts for 44 per cent of total variance. The second component, logistics & finance, accounts for 33 per cent of the remaining variance, and the third component, ecological conditions, accounts for another 13 per cent.

Table 2. Retained principal components (eigenvectors) for pillar 2

Number of observations 129
Number of PCs 3
Rho 0.9016

Components	Variance	Difference	Share in original variance	Cumulative variance
PC 1	3.49246	0.82656	0.4366	0.4366
PC 2	2.6659	1.61158	0.3332	0.7698
PC 3	1.05432		0.1318	0.9016

Rotated components (blanks correspond to coefficients with absolute meaning <0.3);
Rotation: orthogonal varimax (Kaiser off)

Variables	PC 1	PC 2	PC 3	Unexplained variance
Under-5 mortality rate	0.6084			0.07598
Access to safe water services	0.4523			0.1159
School enrollment, secondary	0.38			0.1397
Coverage of essential health services	0.5105			0.08313
Fixed Internet broadband subscriptions		0.4643		0.1475
Logistics performance index		0.665		0.1038
Access to bank account or mobile-money services		0.5477		0.1127
CO_2 emissions			0.9714	0.008691

For the third pillar, equality, we identify four principal components by using the PCA. The analysis is based on 90 observations, i.e. countries that have data for all seven indicators. Together, these principal components explain 83 per cent of the total variance of the seven sub-indices that EEC has selected to measure equality.

Table 3 presents the four components and the contribution that each of the sub-indices makes to explaining the variance in the observed variables for living conditions. For example, the first component, equal labour

participation, accounts for 31 per cent of total variance. The second component, income equality, accounts for 21 per cent of the remaining variance. The third component, equal school enrolment, accounts for 16 per cent of the remaining variance, and the fourth component, equal political participation, accounts for 14 per cent.

Table 3. Retained principal components (eigenvectors) for pillar 3

Number of observations 90
Number of PCs 4
Rho 0.8313

Components	Variance	Difference	Share in original variance	Cumulative variance
PC 1	2.20019	0.72327	0.3143	0.3143
PC 2	1.47692	0.33494	0.211	0.5253
PC 3	1.14198	0.142116	0.1631	0.6884
PC 4	0.999864		0.1428	0.8312

Rotated components (blanks correspond to coefficients with absolute meaning <0.3);
Rotation: orthogonal varimax (Kaiser off)

Variables	PC 1	PC 2	PC 3	PC 4	Unexplained
Employment: youth / adult	0.5778				0.2415
Employment: male / female	0.6137				0.1815
Labour force: male / female	0.5212				0.2589
Income concentration ratio		0.7587			0.1737
Poverty headcount ratio		0.5599	0.3413		0.2431
School enrollment: boys / girls			0.9136		0.07654
Number of seats in national parliaments: male / female				0.9926	0.005952

Each principal component accounts for a maximal amount of variance in the data set that was not accounted for by the previous principal component and is uncorrelated with all other components.

IV The composite index of inclusive growth

Below follows, the rankings of the countries according to the composite index of inclusive growth computed in the present study. The first part of the table ranks 86 economies for which all the necessary data has been gathered. The second part of the table comprises countries lacking data for one or a certain number a pillars, for which, therefore, the composite index could have not been calculated.

Table 4. The composite index of inclusive growth

Rank	Country	Pillar 1: Economy	Pillar 2: Living conditions	Pillar 3: Inequality	Composite index
1	Luxembourg	1	0.888323	0.855471	0.914598
2	Norway	0.747987	0.915541	0.976685	0.880071
3	Denmark	0.501597	0.978018	0.967437	0.815684
4	Netherlands	0.519496	0.969566	0.952602	0.813888
5	Switzerland	0.581177	0.943031	0.913896	0.812701
6	Sweden	0.533488	0.996398	0.887783	0.80589
7	Ireland	0.646474	0.876039	0.816041	0.779518
8	Finland	0.479769	0.955611	0.902101	0.77916
9	Belgium	0.488043	1	0.847499	0.778514
10	Germany	0.461936	0.929881	0.893388	0.761735
11	Austria	0.47552	0.883994	0.923577	0.76103
12	Canada	0.482852	0.870233	0.877717	0.743601
13	France	0.397192	0.917572	0.892189	0.735651
14	United Kingdom	0.396526	0.988665	0.813397	0.732863
15	United States	0.53539	0.856515	0.80329	0.731731
16	Australia	0.456977	0.914355	0.784235	0.718522
17	Slovenia	0.36748	0.843825	0.93369	0.714998
18	Israel	0.373003	0.817258	0.862477	0.684246
19	Czech Republic	0.372411	0.800859	0.861118	0.678129
20	Republic of Korea	0.379914	0.847019	0.801293	0.676075
21	Portugal	0.286172	0.887568	0.79451	0.656083
22	Estonia	0.334854	0.758628	0.826916	0.640132
23	Spain	0.300767	0.905775	0.698361	0.634968
24	Slovakia	0.337206	0.744002	0.804137	0.628448
25	Poland	0.289633	0.764268	0.825693	0.626531
26	Italy	0.349026	0.855309	0.667145	0.623827

Rank	Country	Pillar 1: Economy	Pillar 2: Living conditions	Pillar 3: Inequality	Composite index
27	Hungary	0.317043	0.759389	0.78126	0.619231
28	Lithuania	0.310075	0.75249	0.788244	0.616936
29	**Belarus**	**0.206144**	**0.714162**	**0.875495**	**0.5986**
30	**Kazakhstan**	**0.238057**	**0.583907**	**0.898908**	**0.573624**
31	Latvia	0.254477	0.728478	0.732686	0.57188
32	Bulgaria	0.241508	0.680032	0.780167	0.567236
33	Croatia	0.238968	0.745859	0.681633	0.555487
34	Romania	0.234915	0.695324	0.709369	0.546536
35	Thailand	0.22133	0.725932	0.681376	0.542879
36	Malaysia	0.292846	0.650386	0.615185	0.519472
37	**Russia**	**0.243642**	**0.593578**	**0.688208**	**0.508476**
38	Argentina	0.163652	0.671076	0.655464	0.496731
39	Serbia	0.148528	0.614332	0.70708	0.48998
40	Panama	0.226942	0.621503	0.612389	0.486945
41	Peru	0.14447	0.550693	0.758347	0.484504
42	Costa Rica	0.165574	0.713918	0.570301	0.483264
43	Mexico	0.19898	0.563997	0.685035	0.48267
44	Moldova	0.12285	0.509195	0.814496	0.48218
45	Greece	0.217721	0.78101	0.434346	0.477692
46	Ukraine	0.123153	0.560279	0.719087	0.467506
47	Turkey	0.222338	0.675954	0.500815	0.466369
48	El Salvador	0.115387	0.52485	0.713975	0.451404
49	Bolivia	0.107898	0.448933	0.775965	0.444265
50	Paraguay	0.13632	0.562466	0.583972	0.427586
51	Brazil	0.118916	0.677286	0.460075	0.418759
52	Albania	0.105685	0.535499	0.591778	0.410987
53	Georgia	0.106902	0.586908	0.532782	0.408864
54	Colombia	0.1134	0.623335	0.484282	0.407006
55	Philippines	0.126907	0.468192	0.603956	0.399685
56	Lao	0.123344	0.319065	0.755904	0.399437
57	Rwanda	0.080019	0.335512	0.756642	0.390724
58	**Armenia**	**0.068766**	**0.523838**	**0.566684**	**0.386429**
59	Indonesia	0.123227	0.476652	0.549064	0.382981
60	**Kyrgyzstan**	**0.085959**	**0.445661**	**0.607875**	**0.379832**
61	Ghana	0.080338	0.310984	0.715843	0.369055

Rank	Country	Pillar 1: Economy	Pillar 2: Living conditions	Pillar 3: Inequality	Composite index
62	Zimbabwe	0.065024	0.254493	0.761537	0.360351
63	Burundi	0.059396	0.166248	0.849872	0.358505
64	Nepal	0.073338	0.325853	0.638641	0.345944
65	Honduras	0.10898	0.437046	0.491453	0.345827
66	Morocco	0.104383	0.448483	0.468991	0.340619
67	Guatemala	0.112008	0.386308	0.519641	0.339319
68	Senegal	0.065238	0.240656	0.708284	0.338059
69	Sri Lanka	0.133391	0.584568	0.287201	0.335053
70	Madagascar	0.089779	0.158951	0.752775	0.333835
71	Cameroon	0.079523	0.223327	0.694915	0.332588
72	Iran	0.168601	0.599495	0.221809	0.329968
73	India	0.108236	0.460573	0.397481	0.322097
74	Malawi	0.063601	0.243413	0.654771	0.320595
75	Tunisia	0.113955	0.53501	0.292751	0.313905
76	Tajikistan	0.048006	0.40807	0.484991	0.313689
77	Algeria	0.128492	0.544285	0.263567	0.312115
78	Bangladesh	0.073466	0.382676	0.378972	0.278372
79	Jordan	0.099146	0.512436	0.160115	0.257232
80	Mauritania	0.069953	0.110652	0.579564	0.25339
81	Nigeria	0.077557	0.141079	0.502441	0.240359
82	Pakistan	0.085135	0.170502	0.418191	0.224609
83	Egypt	0.100346	0.53527	0	0.211872
84	Mali	0.044434	0.152469	0.370274	0.189059
85	Chad	0.089334	0.021954	0.365241	0.158843
86	Lesotho	0	0.152517	0.18983	0.114116
The countries to follow lack data on one or a certain number of pillars:					
	Afghanistan		0.119673		
	Angola	0.084702	0.106471		
	Azerbaijan	0.196638			
	Bahamas	0.233978			
	Bahrain	0.495012	0.644366		
	Barbados	0.174415			
	Belize	0.117806			

Rank	Country	Pillar 1: Economy	Pillar 2: Living conditions	Pillar 3: Inequality	Composite index
	Benin	0.085499	0.163365		
	Bhutan	0.137974	0.367416		
	Bosnia and Herzegovina	0.097638			
	Botswana	0.111438			
	Brunei Darussalam	0.539554			
	Burkina Faso	0.062012	0.178524		
	Cabo Verde	0.082656			
	Cambodia	0.129344			
	Central African Republic	0.0402	0		
	Chile	0.221783	0.716466		
	China	0.167809	0.709152		
	Comoros	0.064809	0.2849		
	Congo Dem	0.074568	0.135956		
	Congo; Rep.	0.121178	0.24175		
	Cote Ivoire	0.103861	0.26138		
	Cyprus	0.308918	0.801629		
	Dominica	0.194583	0.635439		
	Ecuador	0.129215	0.613577		
	Equatorial Guinea	0.192583			
	Ethiopia	0.0672			
	Fiji	0.131688			
	Gabon	0.139022			
	Gambia	0.036434			
	Guinea	0.088882	0.122827		
	Guinea-Bissau	0.071452			
	Guyana	0.096239			
	Haiti	0.015847			
	HK	0.613693			
	Iceland	0.743165	1		
	Iraq	0.191443			
	Jamaica	0.100192	0.532865		
	Japan	0.412873	0.883446		
	Kenya	0.042534	0.386222		
	Kuwait	0.562944	0.630621		

Rank	Country	Pillar 1: Economy	Pillar 2: Living conditions	Pillar 3: Inequality	Composite index
	Lebanon	0.16059	0.51582		
	Liberia	0.075991	0.136126		
	Macao SAR; China	0.80409			
	Macedonia	0.106755	0.620732		
	Maldives	0.1859			
	Malta	0.442515	0.845428		
	Mauritius	0.199093	0.678801		
	Mongolia	0.164095	0.420779		
	Montenegro	0.169399	0.610643		
	Mozambique	0.089597		0.740474	
	Myanmar	0.106787	0.31152		
	Namibia	0.05786			
	New Zealand	0.378135	0.900336		
	Nicaragua	0.107869			
	Niger	0.077802	0.051939		
	Oman	0.330146	0.669551		
	Puerto Rico	0.352338			
	Qatar	0.790976	0.699638		
	Samoa	0.112405			
	Saudi Arabia	0.42168	0.643499		
	Sierra Leone	0.068779		0.698208	
	Singapore	0.75296	0.879849		
	Solomon Islands	0.105548			
	South Africa	0.069769	0.463197		
	South Sudan	0.051298			
	St. Lucia	0.075098			
	St. Vincent and the Grenadines	0.064716			
	Sudan	0.040318	0.193522		
	Swaziland	0.054509			
	Tanzania	0.077618		0.77509	
	Togo	0.096668	0.202195		
	Tonga	0.119302			
	Turkmenistan	0.189143	0.351875		
	Uganda	0.07667			

Rank	Country	Pillar 1: Economy	Pillar 2: Living conditions	Pillar 3: Inequality	Composite index
	United Arab Emirates	0.598949	0.701697		
	Uruguay	0.194699	0.751002		
	Uzbekistan	0.105641			
	Vanuatu	0.093482			
	Venezuela	0.125168	0.499		
	Vietnam	0.183903			
	Yemen		0.15952		
	Zambia	0.083585			

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